CU CS Computing Survey Results - Fall 2013

Andy Sayler
andrew.sayler@colorado.edu

Dirk Grunwald
dirk.grunwald@colorado.edu

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Abstract

Each semester, the University of Colorado Computer Science Department runs a department-wide anonymous survey aimed at gathering feedback on our computing infrastructure and services. The survey includes feedback related to student computer usage and ownership, CU CS Virtual Machine usage, Computer Science Education Laboratory (CSEL) usage, and variety of related computing infrastructure usage statistics. This report summarizes the Fall 2013 CU CS Computing Survey data, including comparisons to previous semesters' data where available, and insight into this semester's results.

1 Introduction

As in previous semesters, this semester the CU CS Department conducted a survey in order to collect data on various components of the department's computing infrastructure. This includes the CU CS Virtual Machine (VM), the Computer Science Education laboratory (CSEL), student computer ownership, and various related items. The survey is anonymous, optional, and distributed to the entire department including students (majors, minors, non-majors enrolled in intro CS courses, and graduate), staff, and faculty. This survey was conducted as part of the CS Foundation Program (CSFP) [9], which is tasked with improving the student and instructor experiences in the core CS foundation courses: CSCI 1300 (Intro to Programming), CSCI 2270 (Data Structures), CSCI 2400 (Computer Systems).

The Spring 2013 survey was announced on the afternoon Friday, November 15$^{\text{th}}$, 2013 and was closed on the morning of Saturday, November 23$^{\text{rd}}$, 2013 (e.g. the week before Thanksgiving Break). Overall, the survey collected almost 400 responses. The survey was conducted online via the Qualtrics [8] survey platform. The survey presented both multiple choice and free-response questions. Most survey questions where optional, allowing respondents to skip questions they did not wish to answer. Some survey questions were only presented to respondents if they answered in a certain manner on previous questions (i.e. respondents were only asked VM-related questions if they indicated that they were using the VM, otherwise they were presented with a question as to why they were not using the VM). The full survey content is available in Appendix A.

This semester's survey differed from previous semesters' surveys in several ways.

Department Wide

This semester is the first semester the survey has been distributed to the entire department. In the past, it was only distributed to students in the foundation courses (CSCI 1300, CSCI 2270, and CSCI 2400). Thus, the respondent pool grew considerably this year. The bulk of the respondents are still from the foundation courses, but other respondents also participated.

CSEL and ELRA Questions
: This is the first semester the survey collected data related to the Computer Science Education Laboratory (CSEL) and ELRA compute node usage. This data was collected in order to help guide future CSEL and ELRA development plans.

BA Program
: This is the first semester that the new CS Bachelors of Arts (BA) program has been offered. This has triggered an influx if new students into the foundation courses, and has expanded the CS degree programs beyond the Engineering College to included the College of Arts and Sciences.

Survey Platform
: Where as previous surveys were conducted using Google Drive Forms [4], this semester we conducted the survey using the Qualtrics survey platform [8]. While the end-user experience of these two systems is similar, Qualtrics offers a slightly more refined experience and more powerful survey formatting and data processing capabilities.

Survey Format
: Where as previous surveys have been linearly tracked (e.g. all respondents see the same set of questions), this semester's survey was split into topic-based sections, and respondents were only presented with topics that were relevant to their initially indicated usage modes.

The remainder of this document sums up the results from the survey, compares them to previous results where appropriate, and draws basic conclusions from these results. The following sections are organized by topic. Appendix A includes the survey questions as presented to respondents. Appendix B presents the full multiple choice results in aggregate form[1]. Appendix C presents the free form responses.

2 Demographics

Course	Semester	Enrollment	Respondents	Turnout
CSCI 1300	Spring 13	440	35	8%
CSCI 1300	Fall 13	500	198	40%
CSCI 2270	Spring 13	160	18	11%
CSCI 2270	Fall 13	190	74	39%
CSCI 2400	Spring 13	75	22	29%
CSCI 2400	Fall 13	125	46	37%

Table 1: Foundation Courses Respondent Turnout

This semester's survey saw a more even distribution of respondents across the foundation courses, as well as a higher overall respondent turnout, than previous surveys. This was largely due to a combination of better survey advertising and department-wide survey distribution. Table

[1]Raw, deaggregated survey data is not included in this survey to protect respondent privacy. If you would like access to the raw data, please contact the authors.

1 shows the survey respondent turnout for the Fall 2013 and Spring 2013 semesters by foundation course. The Fall semester shows an almost four fold increase in overall turnout vs the Spring semester (about 400 respondents, up from about 100 respondents). The Fall semester also saw a normalization of foundation course turnout at about 40% from each course. This suggests that survey responses are both up and more proportional to the course enrollment rates than in previous semesters.

Figure 1 shows a summary of the basic survey respondent demographics for the previous two semesters. In addition to the fourfold increase in turnout and normalization of turnout across courses, we also note the addition of Computer Science BA majors as part of the new CS BA program which began this semester. Survey respondents were predominately undergraduate students in one of the three foundation courses. Almost all respondents indicated owning a personal computing device (PCD; i.e. a laptop, desktop, tablet, etc) that they used for coursework. About 70% of the respondents indicated that they were using the official CU CS VM [10] this semester. Likewise, about 65% of respondents indicated using the CSEL this semester.

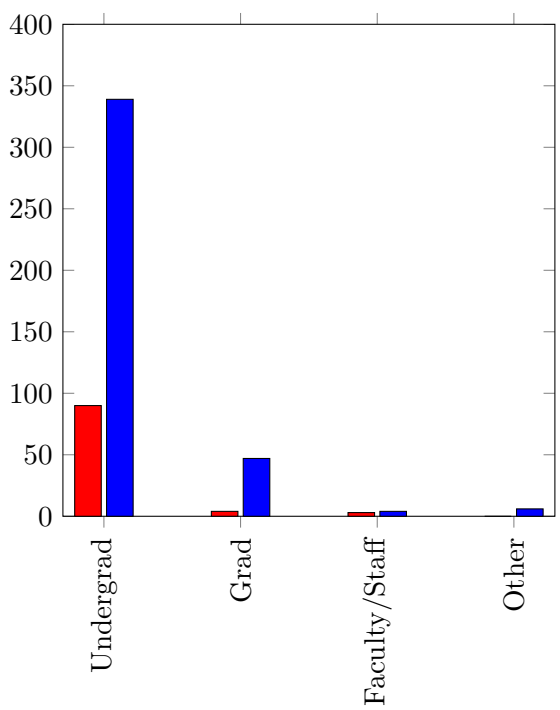
3 Computer Ownership

Respondents who indicated their ownership of a personal computing device were presented with a series of questions regarding the nature of their device. These questions help us gauge the capabilities of the computing hardware to which we can expect students to have access. The full Fall 2013 results from this section are available in Appendix B.

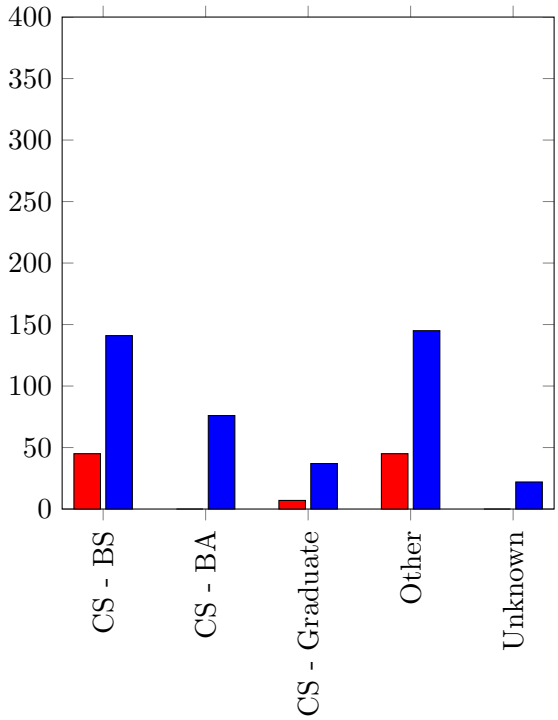
Figure 2 highlights the core survey results related to computer ownership. Spring 2013 results have been scaled to match Fall 2013 response rates and are shown for comparison. As shown in Figure 1d, almost 98% of respondents report owning some form of PCD, suggesting that ownership and access to PCDs is almost ubiquitous across our student body. Of those owning a PCD, about 85% indicated that their primary PCD was a laptop computer. An additional 12% indicated their ownership of a desktop computer, and the remaining 2% indicated some other device (tablet, Chromebook, netbook, etc). The survey question related to PCD device type was not phrased in a manner to distinguish whether or not those reporting their primary PCD as a desktop also have access to a laptop. With the Engineering College considering requiring all students to own a laptop, this would be useful information to collect in future surveys.

The Apple vs PC divide within the CS department remains significant. 36% of respondents indicated their use of a machine running some version of Apple's OSX. 51% of respondents indicated using a Windows-based machine. 10% of respondents indicated using a Linux-based machine. The remaining 3% indicated the use of some other OS (i.e. ChromeOS, IOS, Android, etc) or the use of multiple OSes (i.e. dual-booting Linux and Windows). These results seem to indicate that it would be prudent to continue the CSFP's efforts to support CU CS development environment solutions for all three major operating systems (Windows, OSX, and Linux).

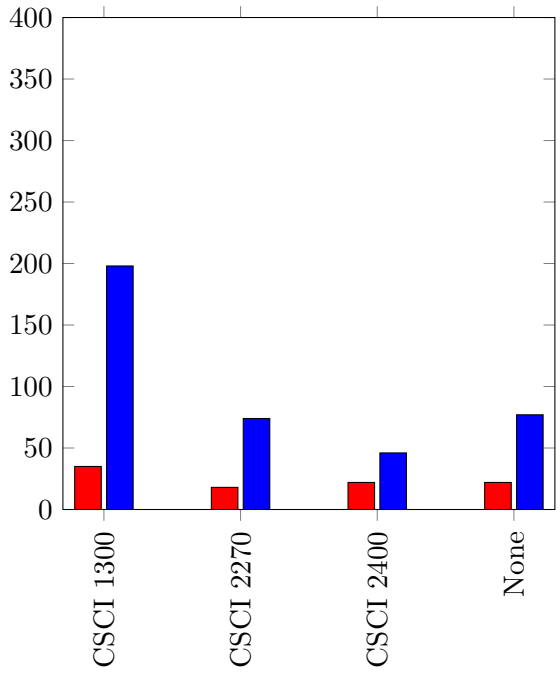
Furthermore, there seems to be a continued trend within the computing user base toward newer operating systems. OSX users seem to be readily upgrading to the latest OS (OSX 10.9), which was released mid-semester, with almost 52% of all OSX users indicating their use of the latest version of OSX. About 22% of OSX users indicated using the second most-recent OSX version (OSX 10.8), with about 26% indicating their use of an older version of OSX. Windows users show a similar trend, although the latest Windows OS (Windows 8/8.1) is not being adopted as readily as the latest version of OSX. This Fall shows a notable shift away from Windows 7 relative to the Spring 2013 results. None the less, Windows 7 remains the most prominent version of Windows with 64% of all Windows users reporting using Windows 7. Windows 8/8.1 use grew to about 32%



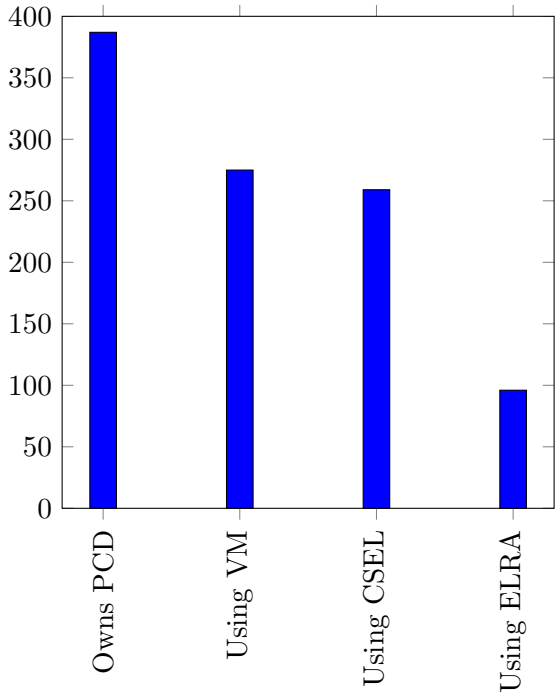
(a) Respondent Type



(b) Respondent Major

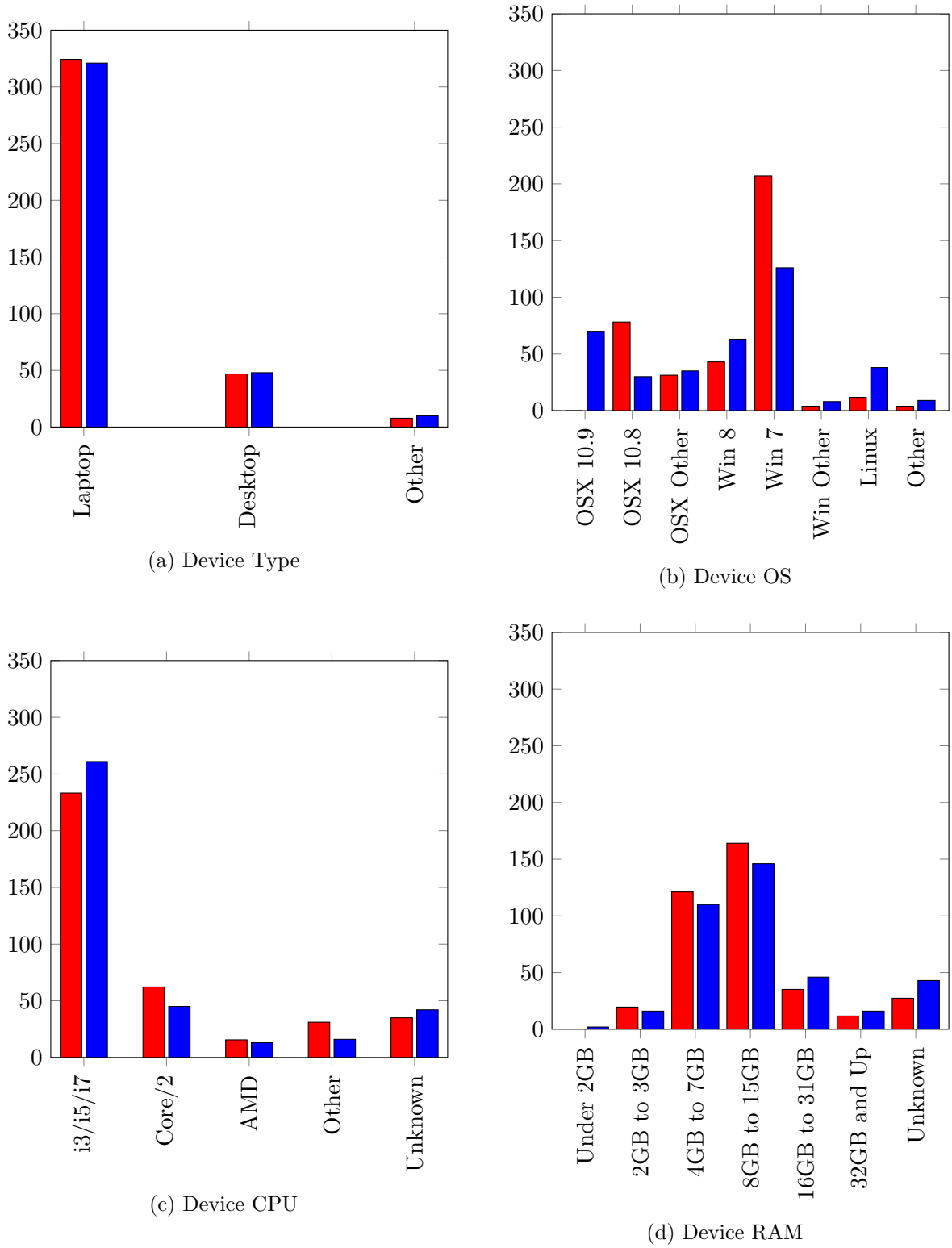


(c) Respondent CSFP Enrollment



(d) Respondent Ownership/Usage

Figure 1: Respondent Demographics (Red - Spring 2013, Blue - Fall 2013)



(a) Device Type

(b) Device OS

(c) Device CPU

(d) Device RAM

Figure 2: Primary Personal Computing Device (Red - Spring 2013*, Blue - Fall 2013)
**Spring 2013 values have been normalized to match Fall 2013 response count*

of the Windows user base. Fortunately, only 4% of Windows users reported using a pre-Windows 7 version of Windows.

In terms of computing power, the trend toward owning computers with modern Intel processors continues. About 69% of the user base reported using an Intel Core i3/i5/i7 processor. This is notable since all of these processors should offer at least minimal hardware virtualization support, enabling a smoother VM experience[2]. Many students (about 11%) were not aware of the type of processor in their machine, but it is likely that they are using newer machines with the standard Intel Core i3/i5/i7 processors. Thus the 69% statistic is likely low. 12% of respondents reported using a machine with a previous-generation Intel processor (Core or Core 2). While some of these processors are capable of supporting modern virtualization and applications, they are getting up there in age, and should ideally be replaced by newer hardware. AMD processors, as well as older Intel processors, remain rare.

Machines with 8GB or more of RAM remain the most common, capturing about 55% of the respondent PCDs. Again, about 11% of respondents were unaware of the amount of RAM in their devises. Many of these machines would likely fall into the 8GB+ average range as well, so, as before, the 55% stat is likely low. Machines with 4GB or 6GB of RAM remain the second most common at about 29%. To successfully run the VM, we recommend at least 4GB of RAM, and it appears that 90%+ of the respondents would meet that requirement (when accounting for those that did not know the amount of RAM in their systems).

We were originally concerned that the rise of tablets, Chromebooks, and other low-power ARM-based computers would lead to an increase in students purchasing these machine in place of normal laptops/desktops. These machines are often ill-suited for CS applications due to their lack of virtualization support, ARM-based design, and mobile (as opposed to desktop) operating systems. Fortunately, we do not seem to be seeing an increase in these devices as laptop/desktop replacements. Overall, it seems that at least 70% to 80% of students are using PCDs that meet the spirit of campus OIT and CS department recommendations (4GB+ of RAM, Intel Core i3/i5/i7 processor). It's likely this number is even higher, assuming the "unknowns" reinforce the average.

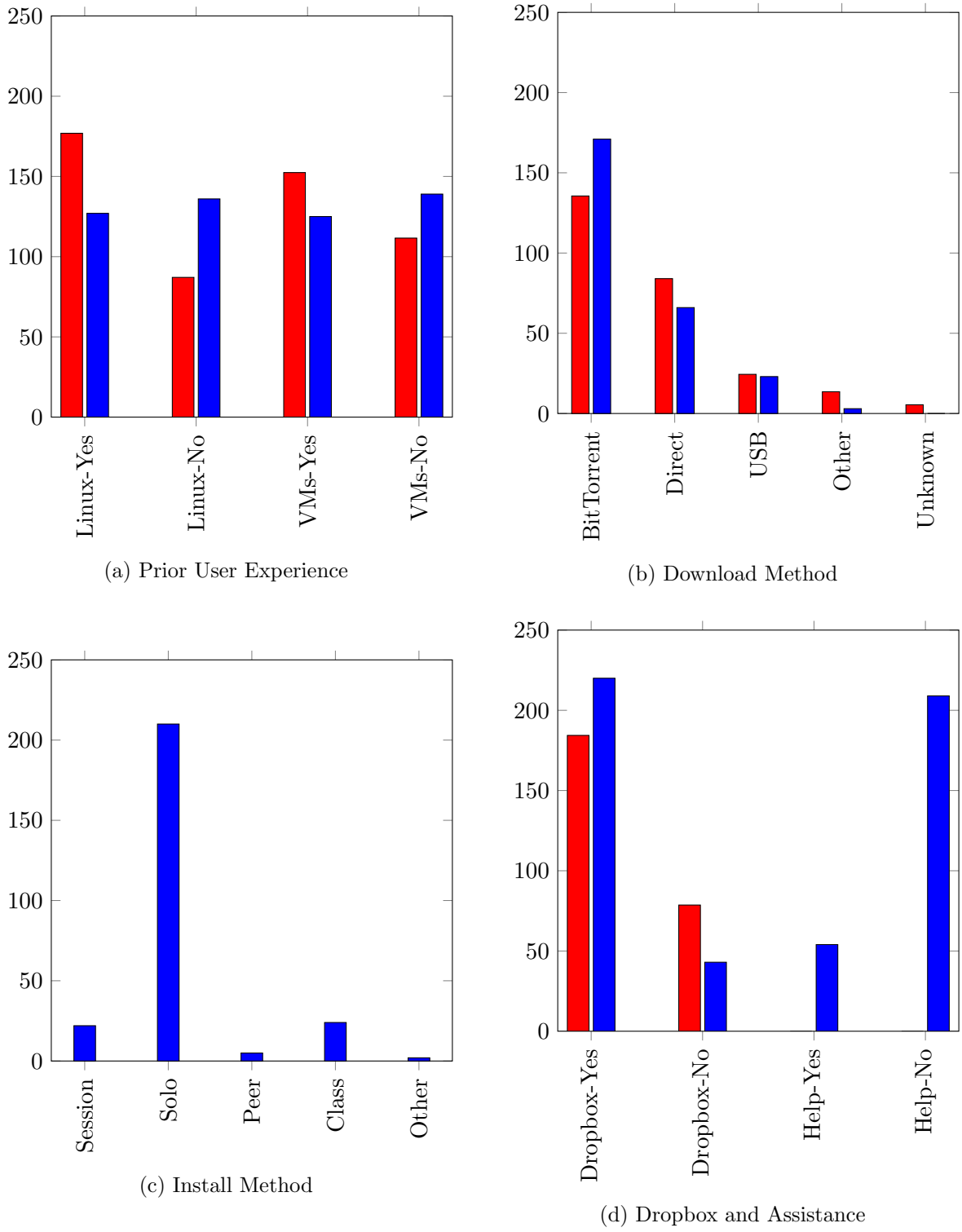
4 VM Results

The CU CS VM [10] is an effort to maintain and distribute a standard development environment for use across all CU CS courses. The VM runs Ubuntu Linux [2] and is designed to be run via the multi-platform VirtualBox [7] hypervisor software. The VM environment is functionally identical to the environment run on the desktop lab computers in the Computer Science Education Laboratory (CSEL). Students without access to their own Linux-based development environments are encouraged to use the VM. The VM comes pre-installed with all of the software required by the CU CS foundation courses, and provides an easy package-based method for installing additional software for upper level CS courses.

Respondents who indicated that they were using the official CU CS virtual machine (VM) this semester were presented with a series of questions regarding the nature of their VM usage and opinion of the VM. These questions help us gauge the effectiveness of the VM in making the CU CS development environment easily accessible to a range of users. They also provide feedback on which to base future VM improvements. The full Fall 2013 results from this section are available in Appendix B. User comments related to the VM are available in Appendix C.

[2]Not all PC manufactures, however, enable hardware virtualization support, even when the processor supports it.

4.1 VM Usage



(a) Prior User Experience

(b) Download Method

(c) Install Method

(d) Dropbox and Assistance

Figure 3: VM Usage (Red - Spring 2013*, Blue - Fall 2013)
**Spring 2013 values have been normalized to match Fall 2013 response count*

Figure 3 shows some basic usage statistics for respondents using the VM. As shown in Figure 3a, a little fewer than half of the user base reported having used Linux in the past. This number is down a bit from last semester's scaled values due to the increase in intro-level, new-to-CS students in the respondent pool this semester. Likewise, a little fewer than half the respondents reported previous experience using virtual machines. Both these statistics indicate that this semesters's respondent pool has less prior experience with the Linux-based VM development environments than in previous surveys.

When obtaining the VM image at the start of the semester, students are presented with BitTorrent [1] and direct HTTP-based download options. The VM image is 2GB to 3GB in size. Students are encouraged to use the BitTorrent download for faster, more reliable downloads. In addition to the downloads, students are given the option of attending VM install sessions where they may copy the VM image from a USB flash drive, no download required. Figure 3b shows the distribution of methods used to obtain the VM image. The bulk of respondents are following the recommendation and using the BitTorrent based download mechanism. This is followed by direct downloads, with only a small minority of users obtaining the VM via the non-download USB drive method.

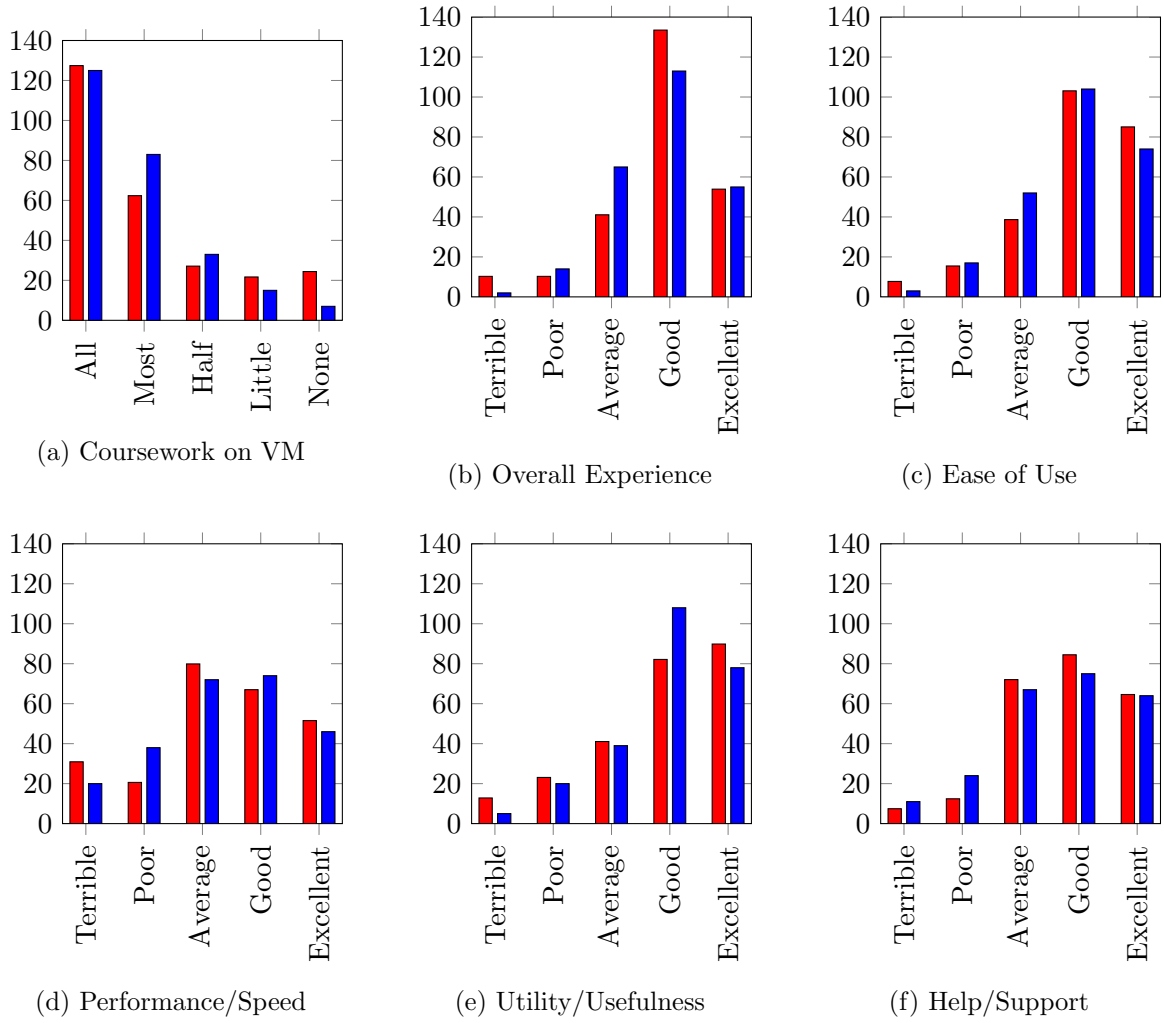
In line with the method for obtaining the VM, Figure 3c shows the method by which users opted to install the VM. The options were to attend a supervised install *session*, to install the VM on their own (e.g. *solo*), to install the VM with help from a friend (e.g. *peer*), or to install the VM during a *class* or recitation lecture. Almost 80% of the respondents report installing the VM on their own, seemingly supporting the assertion that the VM is easy to install with the provided instructions. The remaining students installed the VM via some form of assisted method (install session, friend, or in class).

Finally, Figure 3d shows the frequency with which VM users opted to save/backup their VM work via the Dropbox file-locker service [3] and how many of them had to seek non-install related help with the VM at some point during the semester. After a heavy push toward recommending Dropbox usage this semester, Dropbox usage is up to almost 84% of the respondents pool. This is a good sign, as Dropbox provides a simple method of recovering work in the event that the student's VM crashes or must be re-installed during the semester. Similar to the install numbers, about 20% of the respondent base has had to seek help with some component of the VM this semester. Much of this assistance is likely related to a mid-semester VM update that we rolled out to support additional IDEs on the VM. This update had some unattended side effects that took a few weeks to iron out, requiring more students than normal to seek help during that period.

4.2 VM Experience

Figure 4 shows respondent opinions of various VM traits, as well as the degree to which each respondent uses the VM to complete their coursework. As Figure 4a shows, almost 80% of respondents using the VM report using the VM for all or most of their coursework, indicating that the VM is successfully providing a development platform for foundation CS coursework. This percentage represents a slight increase in coursework completion on the VM relative to the Spring 2013 results.

In addition to completing the bulk of their coursework on the VM, respondents seem to find the VM experience satisfactory. About 67% of respondents indicate that they find the VM experience to be either "Good" or "Excellent". Only 6% of respondents rate their experience as poor or terrible. The experience numbers have normalized a bit (trending toward the average) over the Spring results, likely due to the larger sample size. As in previous semesters, the VM ranks well for ease of use and utility. It ranks poorest for performance and speed, highlighting the continued challenge of ensuring everyone has access to hardware that has the ability, and is properly configured, to support the VM. This semester, VM performance ratings did improve, suggesting that newer hardware and efforts



(a) Coursework on VM

(b) Overall Experience

(c) Ease of Use

(d) Performance/Speed

(e) Utility/Usefulness

(f) Help/Support

Figure 4: VM User Experience (Red - Spring 2013*, Blue - Fall 2013)
**Spring 2013 values have been normalized to match Fall 2013 response count*

to enable hardware-based virtualization extensions are working to increase the VM performance experience.

When students were asked what they would change about the VM, comments don't suggest any clear trends. Some students would like a lighter weight, less feature-rich VM. Others would like a more feature-rich VM. Likewise, some students find the VM's system resource requirements to be too high, slowing their systems, and others would like these requirements increased to improve VM performance on their higher-end machines. Short of offering the VM in multiple flavors (increasing the support burden), it seems that the current VM strikes a decent balance between resource requirements and features.

A handful of students requested that the Sublime text editor [5] be added to the default VM install. Unfortunately, this is not possible since Sublime is closed-source, non-free software and lacks a permissive license that would allow us to distribute it for free with the VM image. Students wishing to use Sublime should purchase (licenses cost $70) and install Sublime themselves. Sublime may be used on a trial basis for free, but the licensing terms require anyone who decides to use Sublime in a productive capacity to purchase a license.

The most common VM complaint is speed and performance issues. Some students began experiencing these issues after the mid-semester VM update. This was likely caused by the fact that the mid-semester update enabled additional kernel drivers that caused many VMs to switch to the prettier, but slower, 3D-based Unity-desktop mode. In the future, we may decide to disable 3D acceleration for the VM by default to force use of the lighter-weight 2D-based Unity environment.

Many of the student complaints about the VM are related to problems for which we have known solutions. This suggests that we may need to do a better job advertising VM support systems and encouraging students with issues to seek help so we can fix the problems they are experiencing. It may also be prudent to create a list of FAQs related to commonly seen issues enabling students to correct common problems themselves.

There were also a handful of students that seemed to indicate a lack of understanding about why the VM was being used at all. These students either already had Linux-based development environments, or were satisfied using IDEs based in their native OSes. It was never our intention to force VM usage. If students have an alternative solution that works well for them, they are welcome and encouraged to use it. The VM is just intended to provide a common, officially supported, plug-and-play system optimized for the majority of CU CS foundation users. Students wishing to pursue alternative solutions on their own are welcome to do so. This point may need to be more clearly communicated in the future to avoid the "I'm being forced to use the VM" bias.

5 CSEL Results

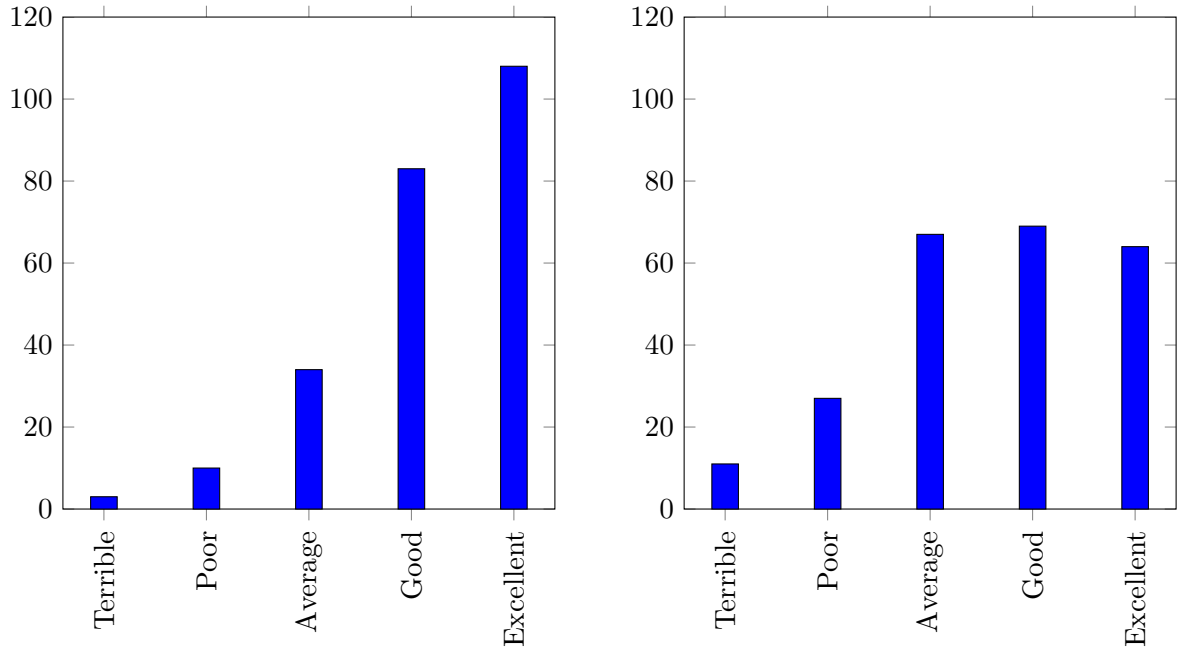
The Computer Science Education Laboratory (CSEL) [6] is a lab and classroom space maintained by the CS department for use of students enrolled in CS courses. It provides desks and space where students can work on their laptops, several rooms of desktops installed with the CS Standard Development Environment (same environment as the VM), a classroom, a conference room, and several offices. This is the first semester we've surveyed CSEL usage. The full Fall 2013 results from this section are available in Appendix B. User comments related to the CSEL are available in Appendix C.

About 66% of survey respondents indicated that they used the CSEL this semester. Of that group, about 70% report using the CSEL at least weekly. The most common uses of the CSEL were for homework (65%), recitations (56%) and TA/LA help/office hours (48%).

Figure 5 shows student ratings of the CSEL. 80% of respondents using the CSEL indicated that they had a "Good" or "Excellent" experience using the CSEL. Only 5% indicated a "Poor" or "Terrible" CSEL usage experience. The CSEL also received generally good marks for space, computer availability, and help. Help and space received the lowest relative markings, indicating that this may be the greatest area to target for improvement.

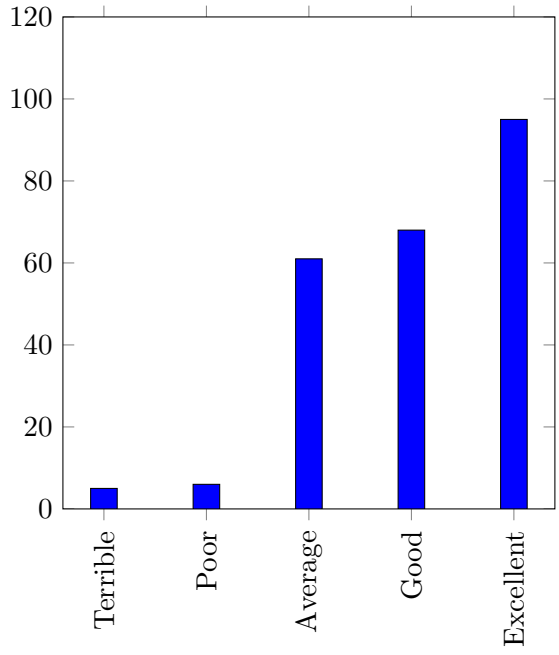
In line with this, student comments on the CSEL indicate a desire for more space. The combination of the increased size of the CS program (with the addition of the BA program), and a push toward revitalizing the CSEL as the central hub of undergraduate CS help has led to the CSEL being more crowded than in the past. Looking for additional CSEL space, or finding ways to more effectively use the existing space, seems a high priority item to pursue.

There are also some basic student CSEL requests that could probably be easily accommodated. The CSEL has whiteboards on many of its walls, but the department does not regularly provide whiteboard markers. Many students requested access to whiteboard markers in the CSEL. The cost for even a few hundred whiteboard markers every semester seems a small price to pay compared to the increased student happiness and CSEL utility it could provide. There are also various requests for a more regular CSEL cleaning schedule and better oversight of the CSEL space from a "is it

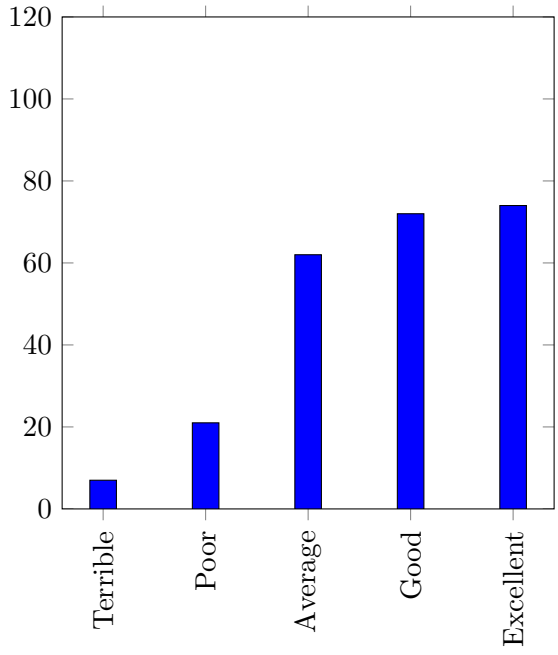


(a) Overall Experience

(b) Availability of Space



(c) Availability of Computers



(d) Availability of Help

Figure 5: CSEL User Experience (Blue - Fall 2013)

clean?", "are markers available?", "is there paper in the printer?" type of perspective. These are items we should look into improving in the future.

The other common theme in the CSEL comments was the need for more TA/LA help in the CSEL. We have done a good job providing access to help across the foundation courses in the

CSEL, but the growth of the CS program means a continued need to provide additional help coverage where possible. Students also requested clearer indication systems for TAs and LAs in the CSEL (i.e. T-shirts, name-tags, etc) to make it easy for students to find the on-duty TA/LA. Finally, students would like a more formal scheduling/ticketing system for TA/LA help, so as to avoid a small number of students monopolizing all TA/LA time. These are all items we can pursue in future semesters.

6 Conclusions

Overall, the Fall 2013 survey represents the most successful we've run thus far. We had a higher, more evenly distributed turnout, more comprehensive results, and more refined questions than in previous semesters. The data supports and reinforces trends we've seen in previous semesters. The data also provides insight into where we can improve and provides a basis for making decisions related to CU CS computing infrastructure. As in previous semesters, the respondent comments provide valuable insight into how students feel about various topics and what we can do to improve upon these topics. We will attempt to act on some of these suggestions and will look for improvement in the Spring 2014 survey results.

References

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[5] Sublime GQ Pty Ltd. Sublime text. `http://www.sublimetext.com/`.

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[7] Oracle. Virtualbox. `https://www.virtualbox.org/`.

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[10] Andy Sayler. Cu cs standard development environment. `http://foundation.cs.colorado.edu/sde/`.

A Survey Questions

Survey Attached

Note that not all questions were presented to all respondents. Personal computer questions were only presented to those who indicated that they used a personal computer this semester. VM questions were only presented to those who indicated that they used the VM this semester. CSEL questions were only presented to those who indicated that they used the CSEL this semester. ELRA questions were only presented to those who indicated that they used the ELRA machines this semester.

Computer Science Foundation Program

About You

I am a:

- [ ] Undergraduate Student
- [ ] Graduate Student
- [ ] Faculty or Staff Member
- [ ] Other

I am majoring in:

- [ ] Computer Science (BS)
- [ ] Computer Science (BA)
- [ ] Computer Science (Graduate)
- [ ] Other (Engineering)
- [ ] Other (Non-Engineering)
- [ ] Unknown

Are you enrolled in one of the following courses this semester?

- ( ) CSCI 1300 (Intro to Programming)
- ( ) CSCI 2270 (Data Structures)
- ( ) CSCI 2400 (Computer Systems)
- ( ) None of the above

I am using a personal computing device (laptop, desktop, tablet, etc) for my coursework this semester:

- ○ Yes
- ○ No

I am using the official CU CS VM (virtual machine) this semester:

- ○ Yes
- ○ No

I have worked in the CSEL at least once this semester:

- ○ Yes
- ○ No

I have used the ELRA remote Linux machines this semester:

- ○ Yes
- ○ No

Personal Computer Info

My primary personal computing device is a:

- ○ Laptop
- ○ Desktop
- ○ Netbook
- ○ Chromebook
- ○ Tablet

- ○ Other
- ○ Unknown

My primary personal computing device is manufactured by:

- ○ Apple
- ○ Lenovo
- ○ Dell
- ○ HP
- ○ Acer
- ○ Asus
- ○ Samsung
- ○ Toshiba
- ○ Other
- ○ Unknown

My primary personal computing device was manufactured:

- ○ before 2009
- ○ in 2009
- ○ in 2010
- ○ in 2011
- ○ in 2012
- ○ in 2013
- ○ Unknown

The OS on my primary personal computing device is:

- ○ Windows XP
- ○ Windows Vista
- ○ Windows 7
- ○ Windows 8/8.1

- ◯ Windows (Other)
- ◯ Windows (Unknown)
- ◯ OSX 10.5 (Leopard)
- ◯ OSX 10.6 (Snow Leopard)
- ◯ OSX 10.7 (Lion)
- ◯ OSX 10.8 (Mountain Lion)
- ◯ OSX 10.9 (Mavericks)
- ◯ OSX (Other)
- ◯ OSX (Unknown)
- ◯ Linux
- ◯ ChromeOS
- ◯ iOS
- ◯ Android
- ◯ Other
- ◯ Unknown

My primary personal computing device has the following processor (CPU):

- ◯ Intel Pentium 4
- ◯ Intel Core (Solo/Due)
- ◯ Intel Core2 (Solo/Due/Quad/Extreme)
- ◯ Intel Core i3/i5/i7
- ◯ Intel Atom
- ◯ Intel (Other)
- ◯ Intel (Unknown)
- ◯ AMD (Any)
- ◯ ARM (Any)
- ◯ Other
- ◯ Unknown

My primary personal computing device has the following amount of memory (RAM):

- ○ 1 GB
- ○ 2 GB
- ○ 3 GB
- ○ 4 GB
- ○ 8 GB
- ○ 16 GB
- ○ 32 GB
- ○ Other
- ○ Unknown

My primary personal computing device has the following number of physical processor (CPU) cores:

- ○ 1
- ○ 2
- ○ 4
- ○ 8
- ○ Other
- ○ Unknown

No Personal Computer

I complete most of my coursework:

- ○ In a university computer lab (Engineering Center)
- ○ In a university computer lab (Non-Engineering Center)
- ○ In a public computer lab (public library, etc)
- ○ On a friend's or family member's computer
- ○ On a computer at my place of work
- ○ Not on a computer at all
- ○ Other

VM - Usage

I am using the VM as part of:

- [ ] CSCI 1300 (Intro to Programming)
- [ ] CSCI 2270 (Data Structures)
- [ ] CSCI 2400 (Computer Systems)
- [ ] CSCI 3155 (Programming Languages)
- [ ] CSCI 3202 (Intro to AI)
- [ ] CSCI 4273 (Network Systems)
- [ ] Other

I have used a VM before this semester:

- ( ) Yes
- ( ) No

I have used Linux before this semester:

- ( ) Yes
- ( ) No

When did you install the version of the VM you are CURRENTLY using?

- ( ) Fall 2013
- ( ) Summer 2013
- ( ) Spring 2013
- ( ) Fall 2012
- ( ) Other

When did you first start using the official CU CS VM?

- ○ Fall 2013
- ○ Summer 2013
- ○ Spring 2013
- ○ Fall 2012
- ○ Other

How did you obtain the version of the VM you are currently using?

- ○ Downloaded via BitTorrent
- ○ Downloaded Directly (without BitTorrent)
- ○ Copied from USB flash drive
- ○ Other

How did you install the version of the VM you are currently using?

- ○ At a VM install session or VM office hours
- ○ On my own
- ○ With help from a friend
- ○ With help from a TA or Instructor
- ○ Other

Have you gotten help related to using the VM this semester (not counting initial install help)?

- ○ Yes
- ○ No

How much of your CS coursework do you complete on the VM?

- ○ All of it
- ○ Most of it
- ○ Half of it
- ○ Little of it
- ○ None of it

Do you use Dropbox on the VM to store or backup your work?

- ○ Yes
- ○ No

About how frequently do you install software updates on the VM?

- ○ Never
- ○ Once a semester
- ○ Once a month
- ○ Once a week
- ○ As often as I can

What editor/IDE do you prefer to use on the VM?

- ○ Geany
- ○ gedit
- ○ emacs
- ○ vi/vim
- ○ NetBeans
- ○ BlueJ
- ○ Other
- ○ No preference

VM - Ratings

Please rate the following from worst (one star) to best (five stars):

Overall Experience with the VM	
VM Ease of Use	
VM Performance/Speed	
VM Utility/Usefulness	
VM Help and Support	

I would change the following in the VM:
(Optional)

I have the following problems/complaints regarding the VM:
(Optional)

General VM Comments:
(Optional)

No VM

Why are you not using the official CU CS VM?

- [ ] I don't need a Linux development environment
- [ ] I run my own Linux development environment
- [ ] I am using a separate course-specific VM
- [ ] I am satisfied using the provided CU Linux labs
- [ ] I am unable to run the VM on my personal computing device
- [ ] I lack a personal computing device on which to run the VM
- [ ] Other

CSEL - Usage

What do you use the CSEL for?

- [ ] Recitations
- [ ] Homework
- [ ] TA/LA Office Hours
- [ ] TA/LA Grading Sessions
- [ ] Linux Computer Access
- [ ] Group Work
- [ ] Free Printing
- [ ] Access to Other Students
- [ ] Other

How often do you use the CSEL

- Never
- Less than Once a Month
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- Daily

How often do you use the desktop computers in the CSEL?

- Never
- Less than Once a Month
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- Daily

How often do you use your laptop or other personal computing device in the CSEL?

- Never
- Less than Once a Month
- Once a Month
- 2-3 Times a Month
- Once a Week
- 2-3 Times a Week
- Daily

CSEL - Ratings

Please rate the following from worst (one star) to best (five stars):

Overall Experience Using the CSEL

Availability of Space in the CSEL

Availability of Computers in the CSEL

Availability of Help in the CSEL

I would change the following in the CSEL:
(Optional)

I have the following problems/complaints regarding the CSEL:
(Optional)

General CSEL Comments
(Optional)

No CSEL

Why are you not using the CSEL?

- [ ] I have no need for the CSEL's services

- [ ] I dislike the atmosphere in the CSEL
- [ ] I am not aware of the CSEL
- [ ] The CSEL is too crowded
- [ ] The CSEL is too noisy or has too many distractions
- [ ] The CSEL is too far away from where I live/work
- [ ] Other

ELRA - Usage

How often do you use the ELRA machines?

- ( ) Never
- ( ) Less than Once a Month
- ( ) Once a Month
- ( ) 2-3 Times a Month
- ( ) Once a Week
- ( ) 2-3 Times a Week
- ( ) Daily

Which ELRA machines have you used this semester?

- [ ] elra-01
- [ ] elra-02
- [ ] elra-03
- [ ] elra-04

What do you use the ELRA machines for?

- [ ] Linux environment access from a non-Linux machine
- [ ] Long running compute jobs
- [ ] Access to CSEL home folder and file storage
- [ ]

Access to specialized programs (MATLAB, etc)

- [ ] Other

How do you access the ELRA machines?

- [ ] Default SSH client on Linux
- [ ] Default SSH client on OSX
- [ ] Putty SSH client on Windows
- [ ] Other SSH client on Windows
- [ ] Other

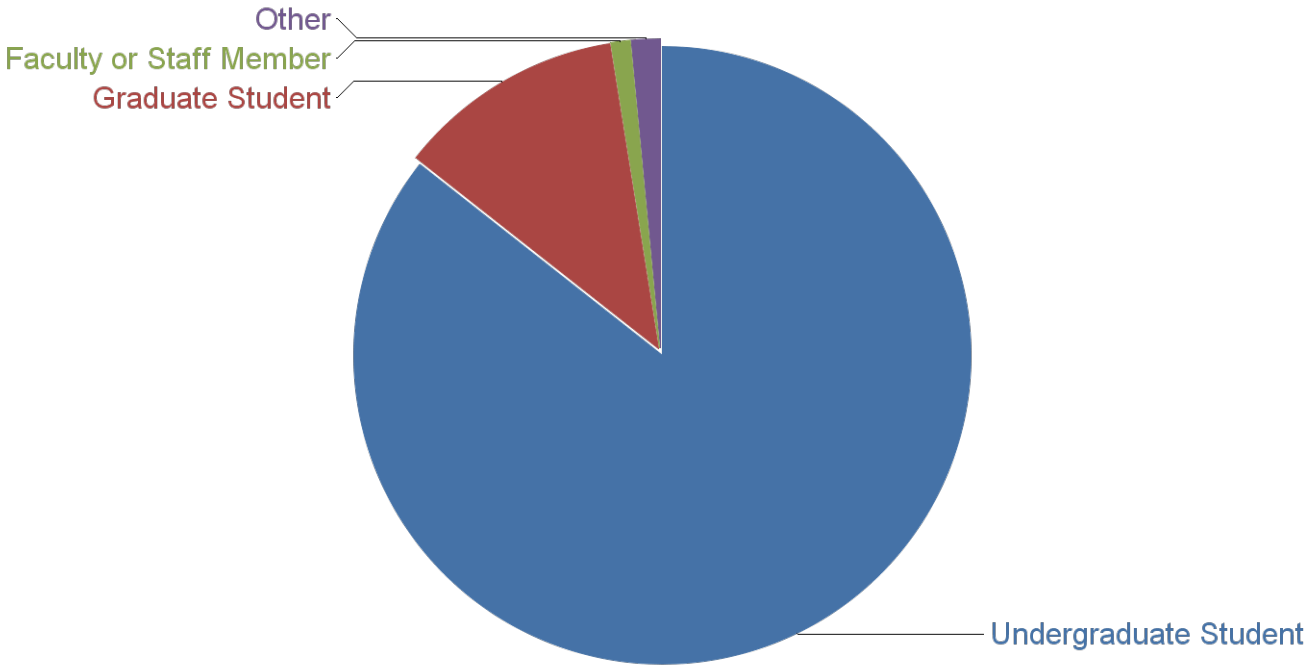
Generic

Any Final General Comments:
(Optional)

B Data Report - Multiple Choice

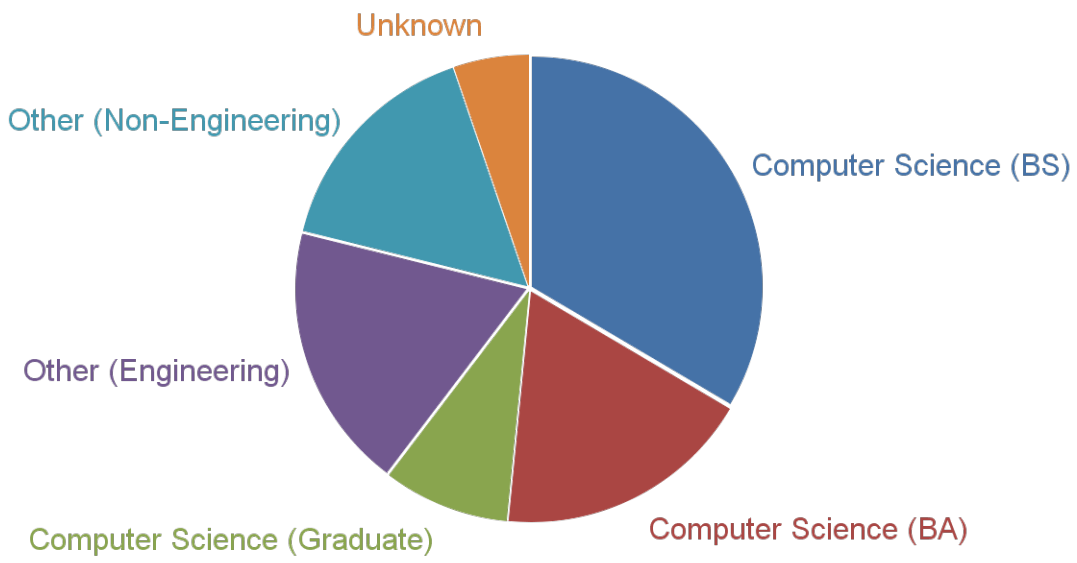
Report Attached

I am a:



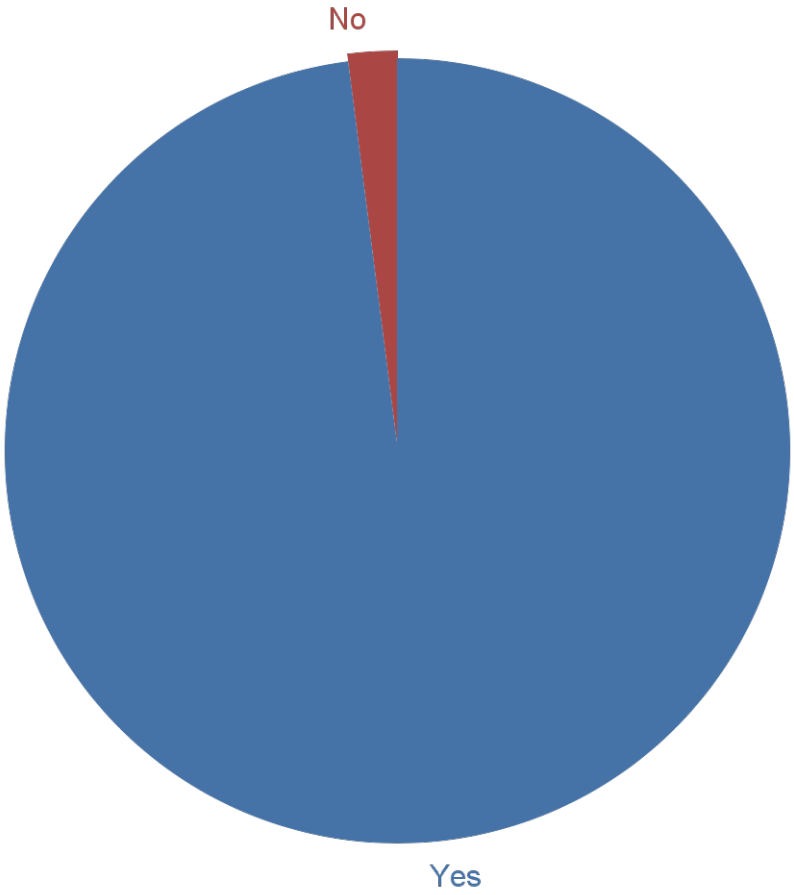
#	Answer	Bar	Response	%
1	Undergraduate Student		339	85.82%
2	Graduate Student		47	11.90%
3	Faculty or Staff Member		4	1.01%
4	Other		6	1.52%
	Total		396	100.00%

I am majoring in:



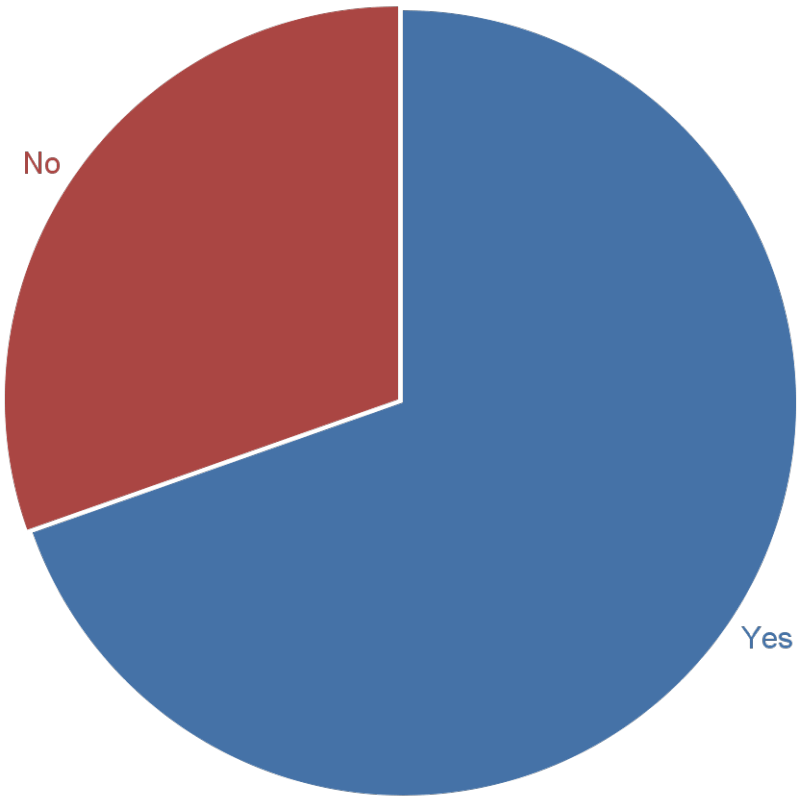
#	Answer	Bar	Response	%
1	Computer Science (BS)		141	35.79%
2	Computer Science (BA)		76	19.29%
3	Computer Science (Graduate)		37	9.39%
4	Other (Engineering)		78	19.80%
5	Other (Non-Engineering)		67	17.01%
6	Unknown		22	5.58%
	Total		421	100.00%

I am using a personal computing device (laptop, desktop, tablet, etc) for my coursework this semester:



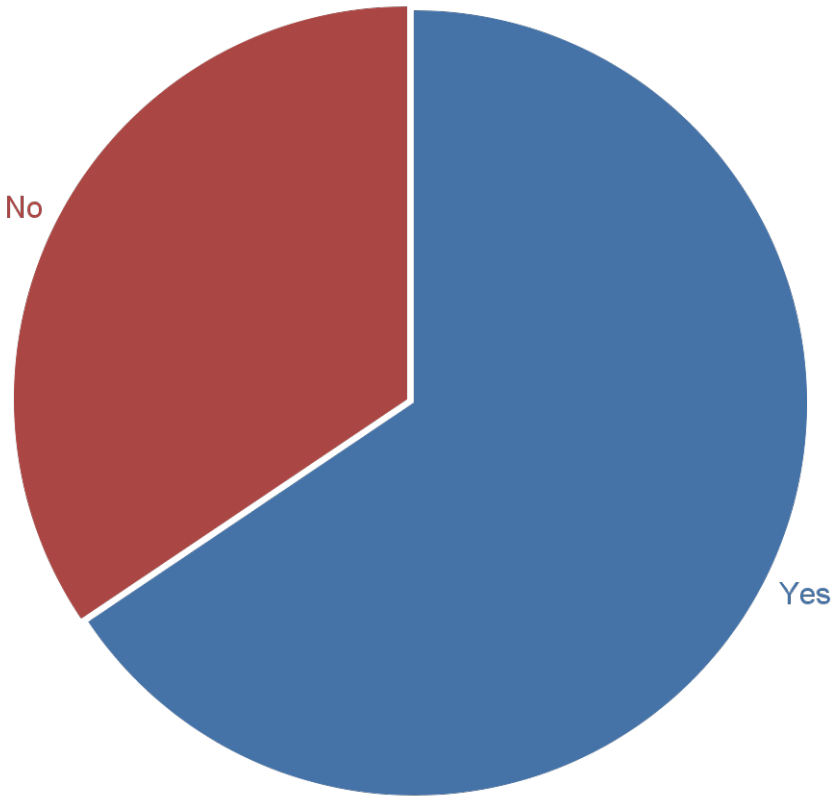
#	Answer	Bar	Response	%
1	Yes		387	97.97%
2	No		8	2.03%
	Total		395	100.00%

I am using the official CU CS VM (virtual machine) this semester:



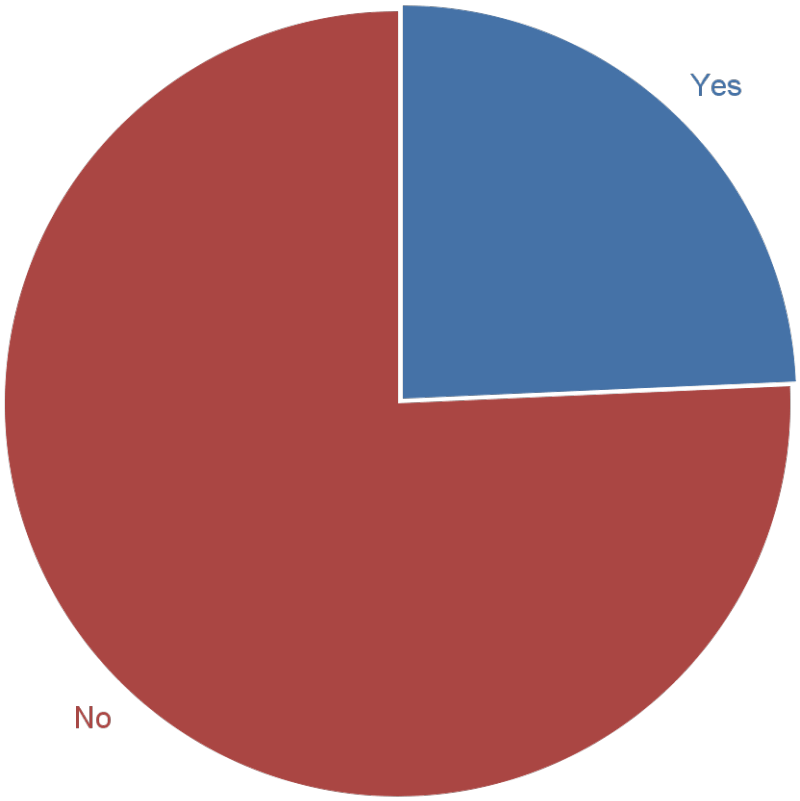
#	Answer	Bar	Response	%
1	Yes		275	69.62%
2	No		120	30.38%
	Total		395	100.00%

I have worked in the CSEL at least once this semester:



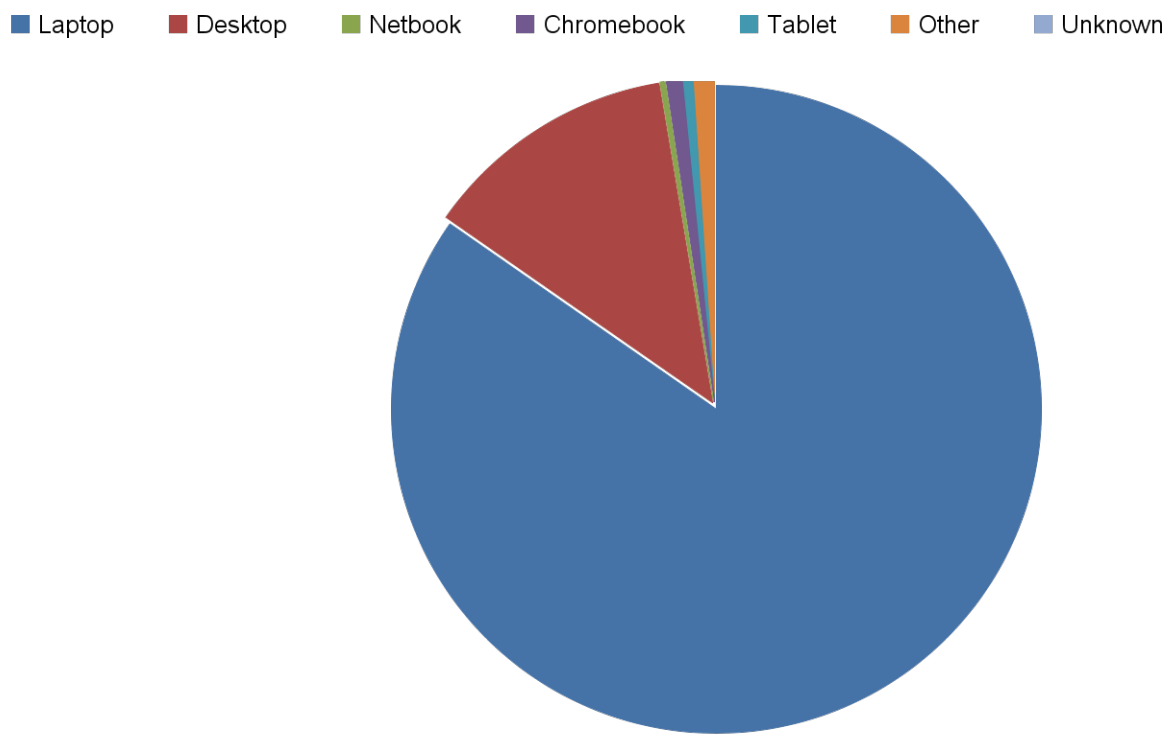
#	Answer	Bar	Response	%
1	Yes		259	65.57%
2	No		136	34.43%
	Total		395	100.00%

I have used the ELRA remote Linux machines this semester:



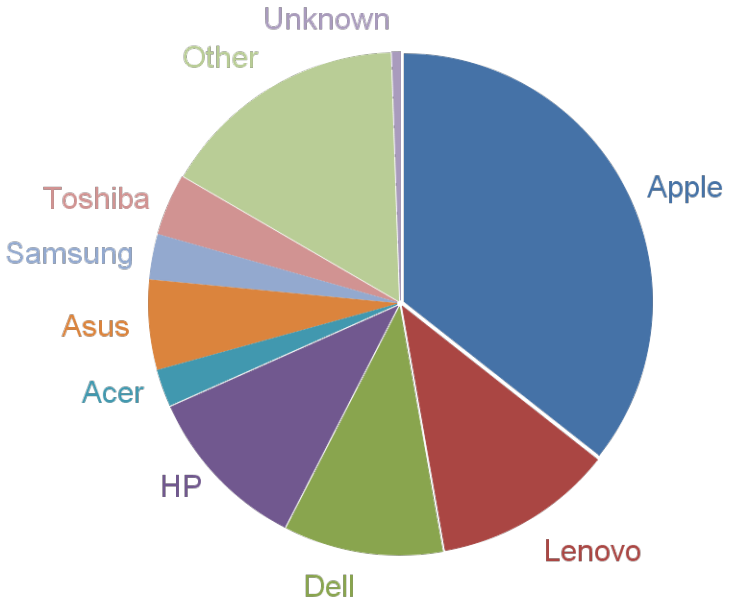
#	Answer	Bar	Response	%
1	Yes		96	24.30%
2	No		299	75.70%
	Total		395	100.00%

My primary personal computing device is a:



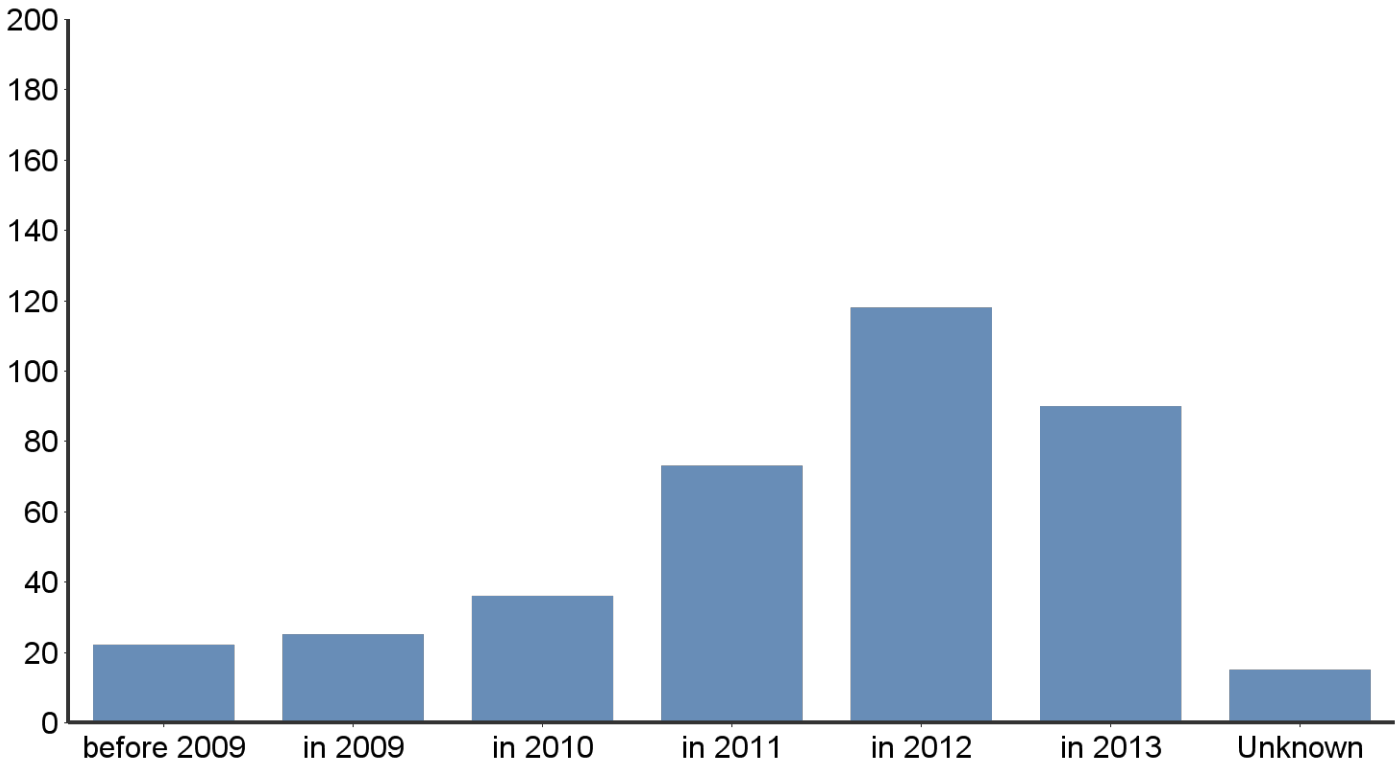
#	Answer	Bar	Response	%
1	Laptop		321	84.70%
2	Desktop		48	12.66%
3	Netbook		1	0.26%
4	Chromebook		3	0.79%
5	Tablet		2	0.53%
6	Other		4	1.06%
7	Unknown		0	0.00%
	Total		379	100.00%

My primary personal computing device is manufactured by:



#	Answer	Bar	Response	%
1	Apple		135	35.62%
2	Lenovo		44	11.61%
3	Dell		39	10.29%
4	HP		41	10.82%
5	Acer		9	2.37%
6	Asus		22	5.80%
7	Samsung		11	2.90%
8	Toshiba		15	3.96%
9	Other		61	16.09%
10	Unknown		2	0.53%
	Total		379	100.00%

My primary personal computing device was manufactured:

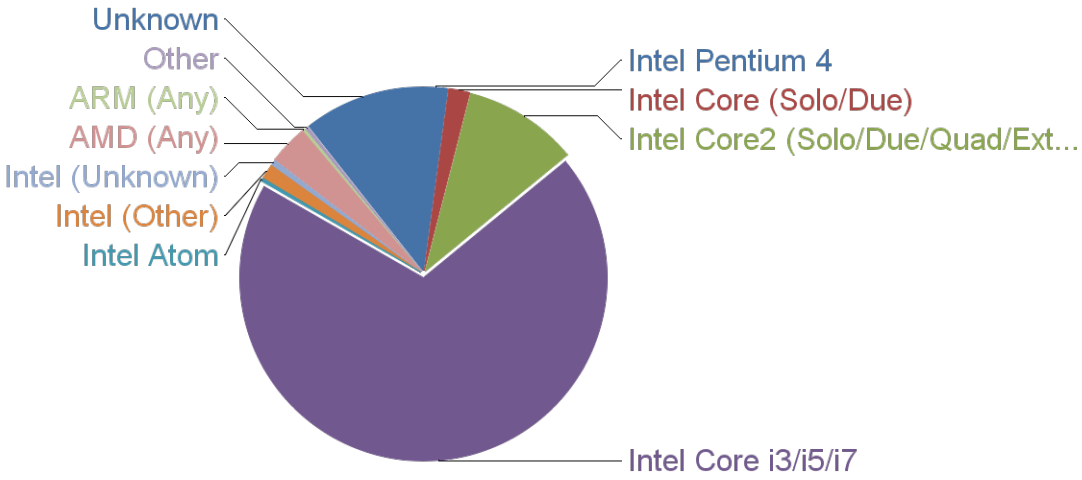


#	Answer	Bar	Response	%
1	before 2009		22	5.80%
2	in 2009		25	6.60%
3	in 2010		36	9.50%
4	in 2011		73	19.26%
5	in 2012		118	31.13%
6	in 2013		90	23.75%
7	Unknown		15	3.96%
	Total		379	100.00%

The OS on my primary personal computing device is:

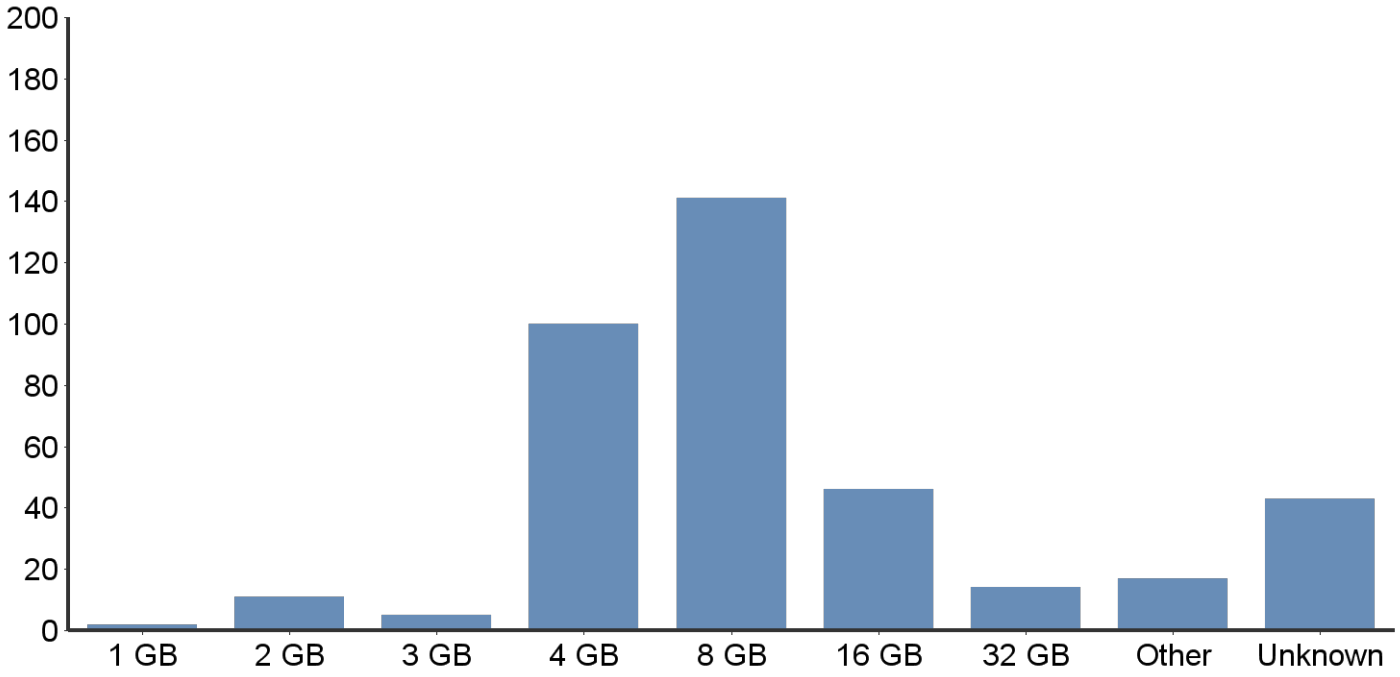
#	Answer	Bar	Response	%
1	Windows XP		4	1.06%
2	Windows Vista		3	0.79%
3	Windows 7		126	33.25%
4	Windows 8/8.1		63	16.62%
5	Windows (Other)		0	0.00%
6	Windows (Unknown)		1	0.26%
7	OSX 10.5 (Leopard)		5	1.32%
8	OSX 10.6 (Snow Leopard)		9	2.37%
9	OSX 10.7 (Lion)		19	5.01%
10	OSX 10.8 (Mountain Lion)		30	7.92%
11	OSX 10.9 (Mavericks)		70	18.47%
12	OSX (Other)		0	0.00%
13	OSX (Unknown)		2	0.53%
14	Linux		38	10.03%
15	ChromeOS		0	0.00%
16	iOS		0	0.00%
17	Android		1	0.26%
18	Other		7	1.85%
19	Unknown		1	0.26%
	Total		379	100.00%

My primary personal computing device has the following processor (CPU):



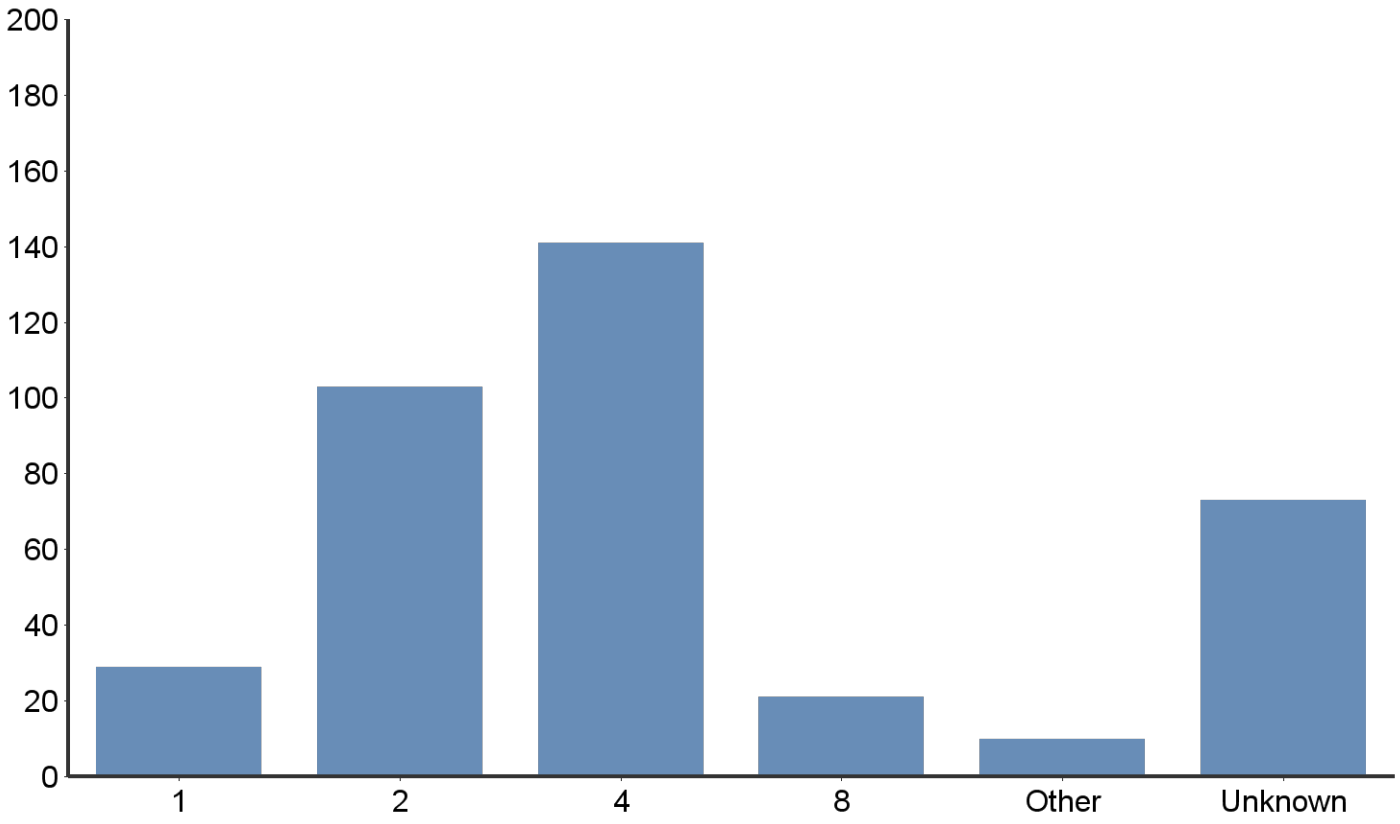
#	Answer	Bar	Response	%
1	Intel Pentium 4		8	2.12%
2	Intel Core (Solo/Due)		7	1.86%
3	Intel Core2 (Solo/Due/Quad/Extreme)		38	10.08%
4	Intel Core i3/i5/i7		261	69.23%
5	Intel Atom		1	0.27%
6	Intel (Other)		5	1.33%
7	Intel (Unknown)		2	0.53%
8	AMD (Any)		13	3.45%
9	ARM (Any)		1	0.27%
10	Other		1	0.27%
11	Unknown		40	10.61%
	Total		377	100.00%

My primary personal computing device has the following amount of memory (RAM):



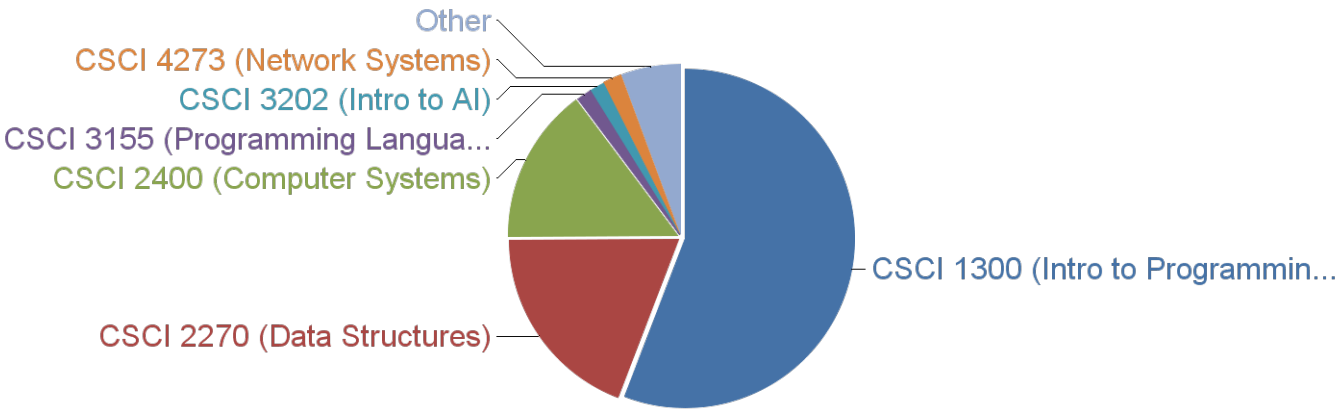
#	Answer	Bar	Response	%
1	1 GB		2	0.53%
2	2 GB		11	2.90%
3	3 GB		5	1.32%
4	4 GB		100	26.39%
5	8 GB		141	37.20%
6	16 GB		46	12.14%
7	32 GB		14	3.69%
8	Other		17	4.49%
9	Unknown		43	11.35%
	Total		379	100.00%

My primary personal computing device has the following number of physical processor (CPU) cores:



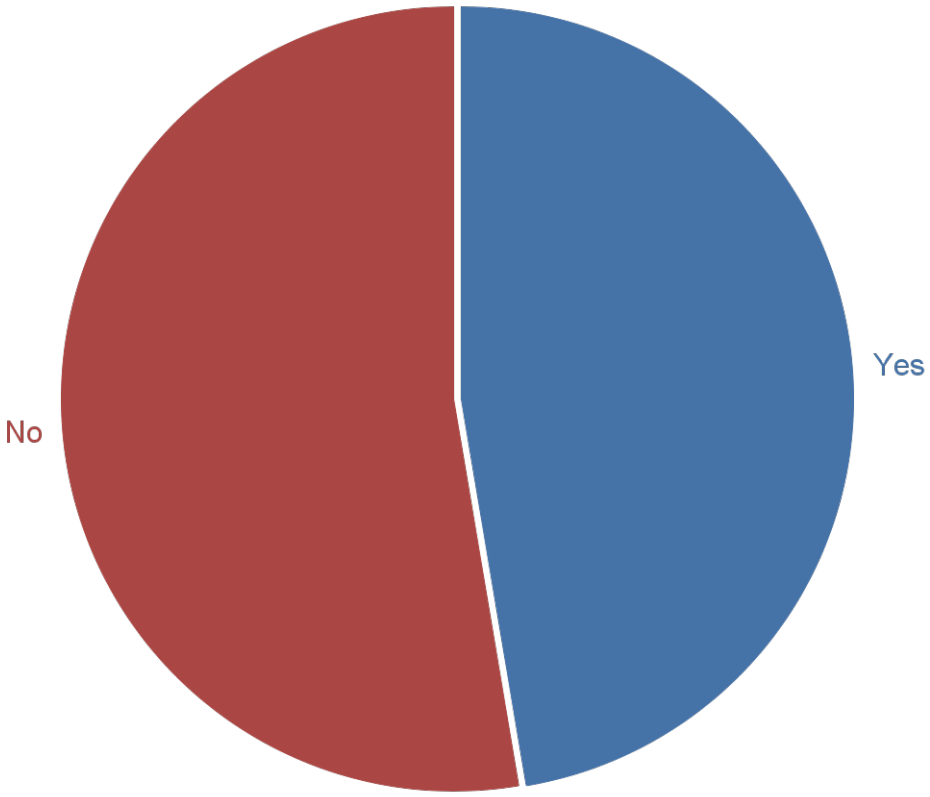
#	Answer	Bar	Response	%
1	1		29	7.69%
2	2		103	27.32%
3	4		141	37.40%
4	8		21	5.57%
5	Other		10	2.65%
6	Unknown		73	19.36%
	Total		377	100.00%

I am using the VM as part of:



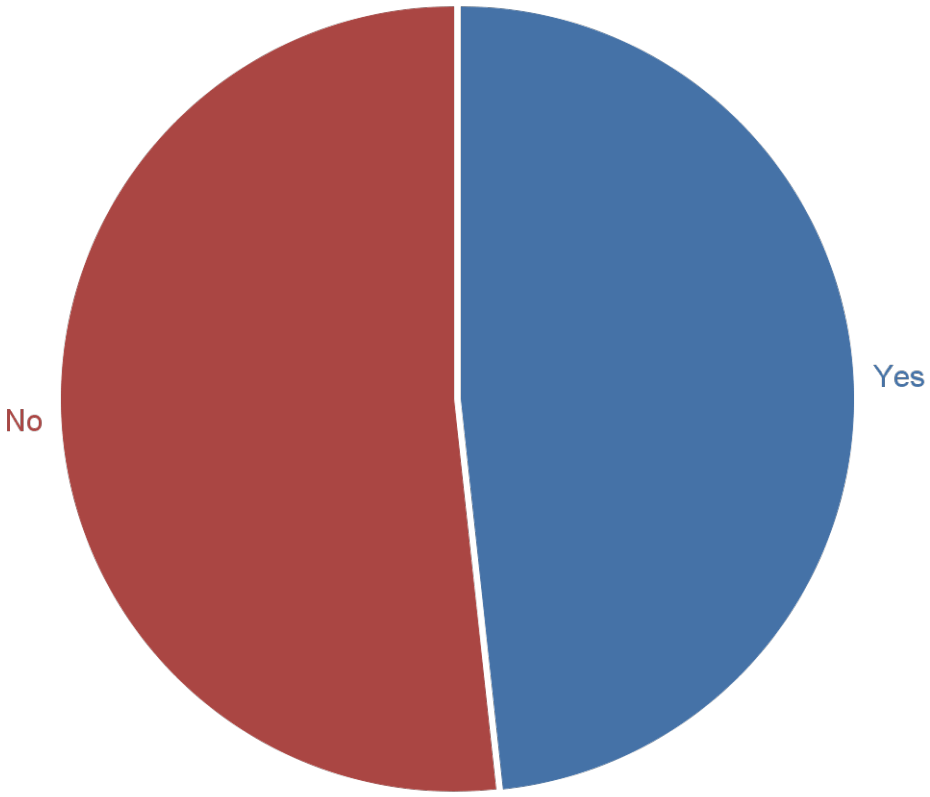
#	Answer	Bar	Response	%
1	CSCI 1300 (Intro to Programming)		158	59.85%
2	CSCI 2270 (Data Structures)		54	20.45%
3	CSCI 2400 (Computer Systems)		42	15.91%
4	CSCI 3155 (Programming Languages)		4	1.52%
5	CSCI 3202 (Intro to AI)		4	1.52%
6	CSCI 4273 (Network Systems)		5	1.89%
7	Other		16	6.06%
	Total		283	100.00%

I have used a VM before this semester:



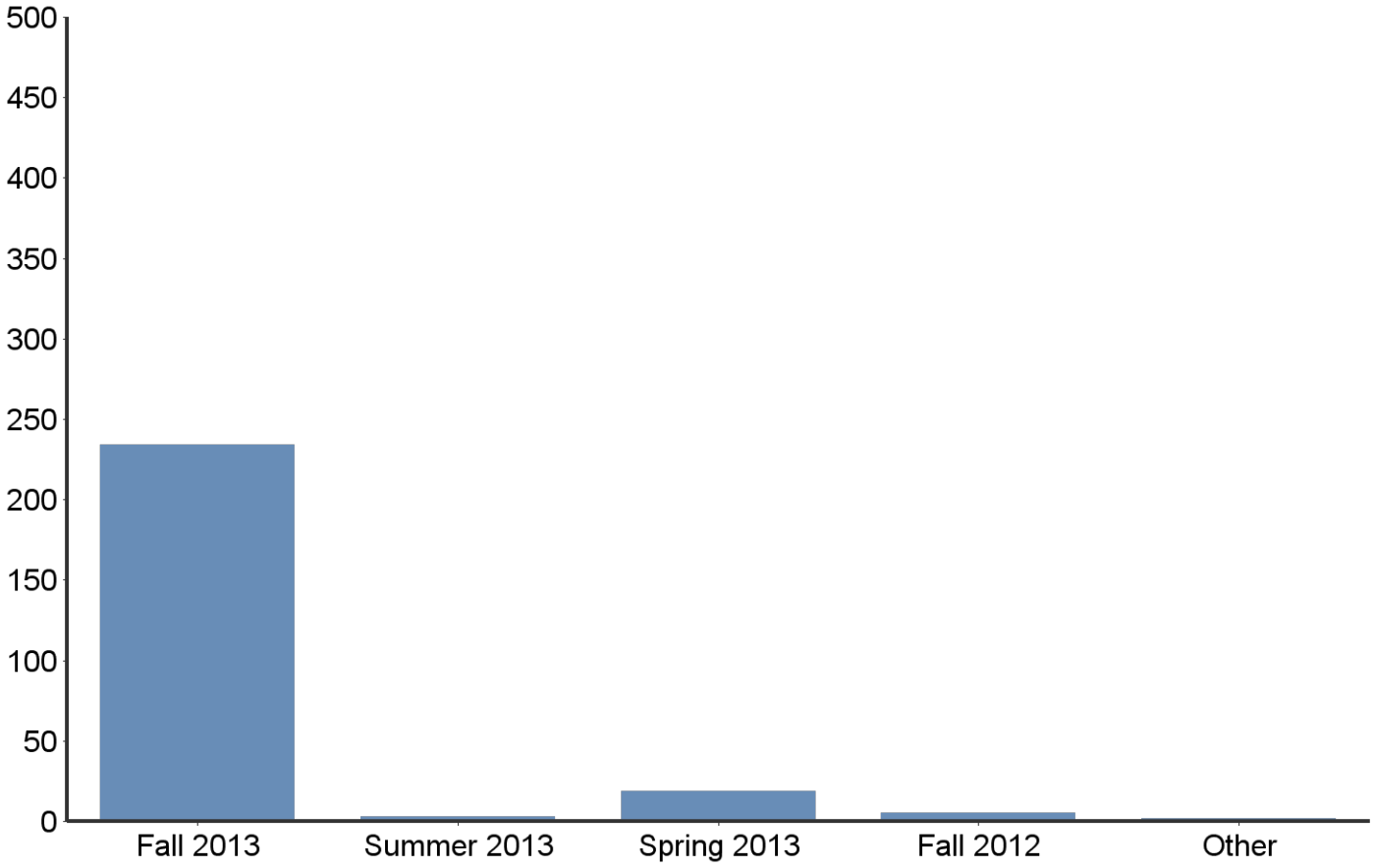
#	Answer	Bar	Response	%
1	Yes		125	47.35%
2	No		139	52.65%
	Total		264	100.00%

I have used Linux before this semester:



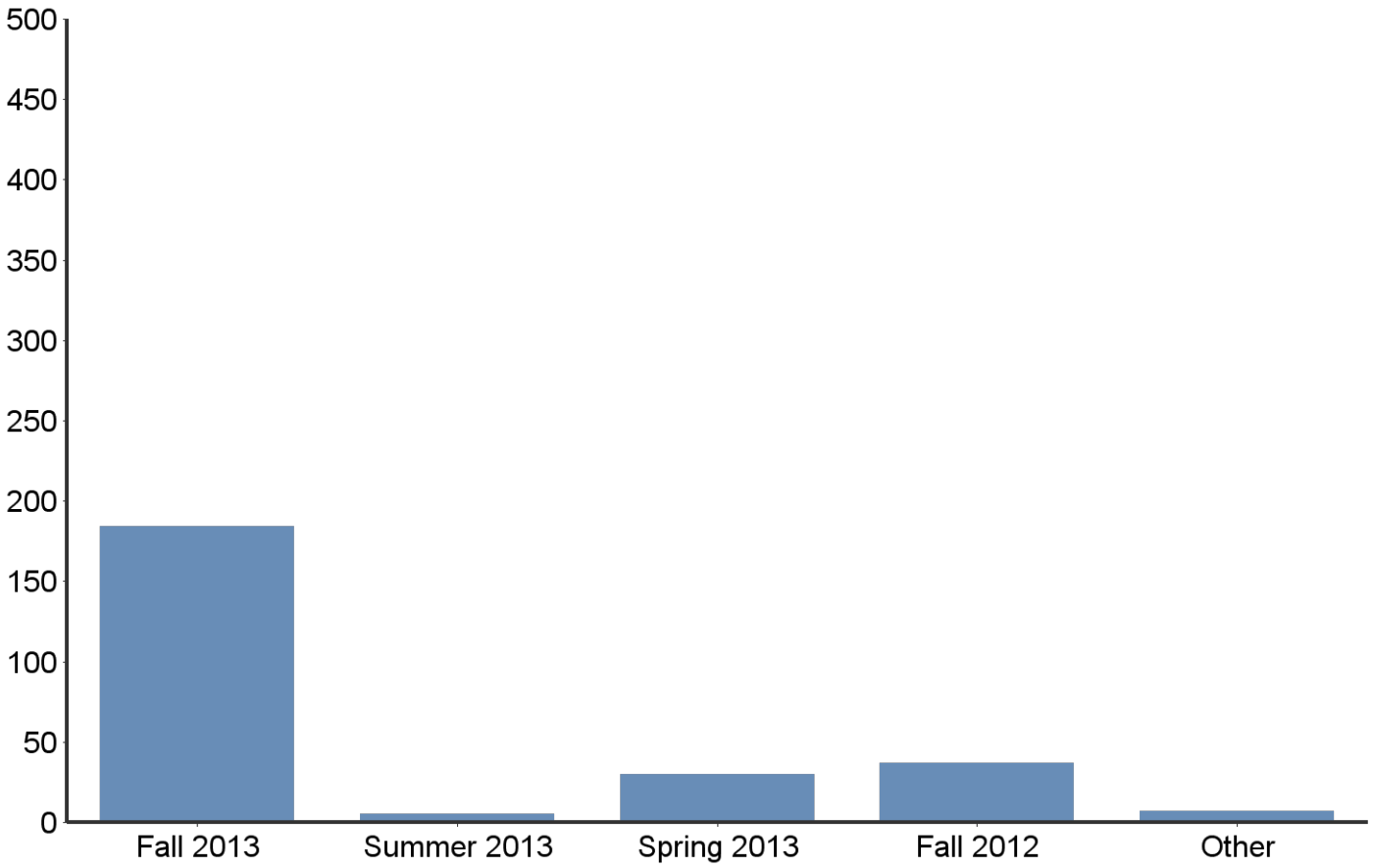
#	Answer	Bar	Response	%
1	Yes		127	48.29%
2	No		136	51.71%
	Total		263	100.00%

When did you install the version of the VM you are CURRENTLY using?



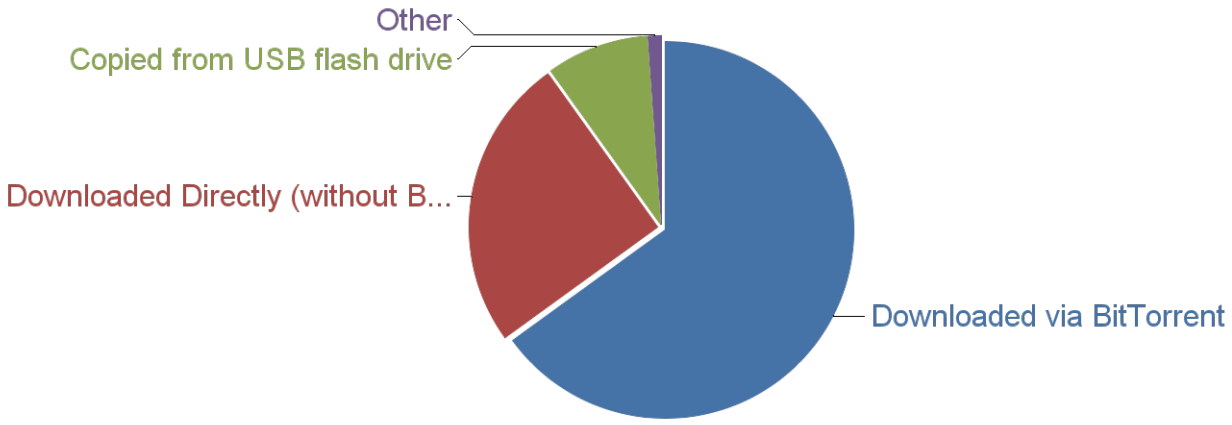
#	Answer	Bar	Response	%
1	Fall 2013		234	88.97%
2	Summer 2013		3	1.14%
3	Spring 2013		19	7.22%
4	Fall 2012		5	1.90%
5	Other		2	0.76%
	Total		263	100.00%

When did you first start using the official CU CS VM?



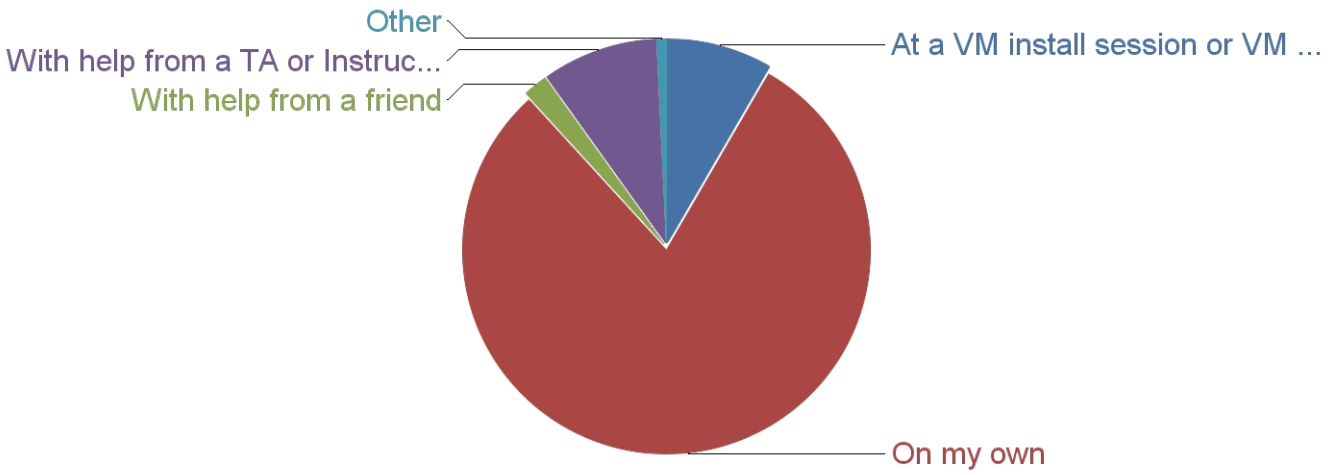
#	Answer	Bar	Response	%
1	Fall 2013		184	69.96%
2	Summer 2013		5	1.90%
3	Spring 2013		30	11.41%
4	Fall 2012		37	14.07%
5	Other		7	2.66%
	Total		263	100.00%

How did you obtain the version of the VM you are currently using?



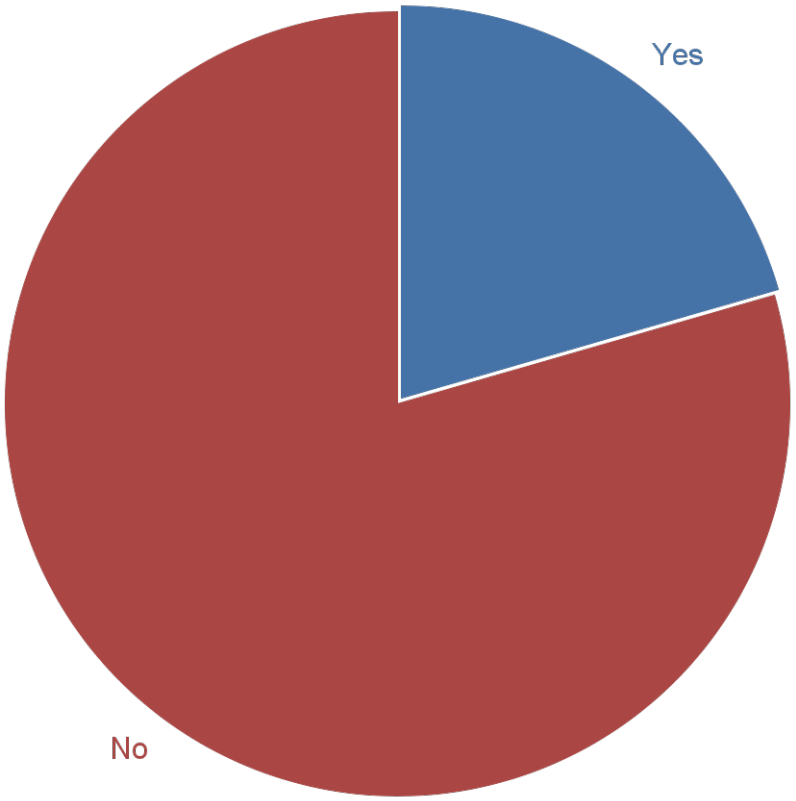
#	Answer	Bar	Response	%
1	Downloaded via BitTorrent		171	65.02%
2	Downloaded Directly (without BitTorrent)		66	25.10%
3	Copied from USB flash drive		23	8.75%
4	Other		3	1.14%
	Total		263	100.00%

How did you install the version of the VM you are currently using?



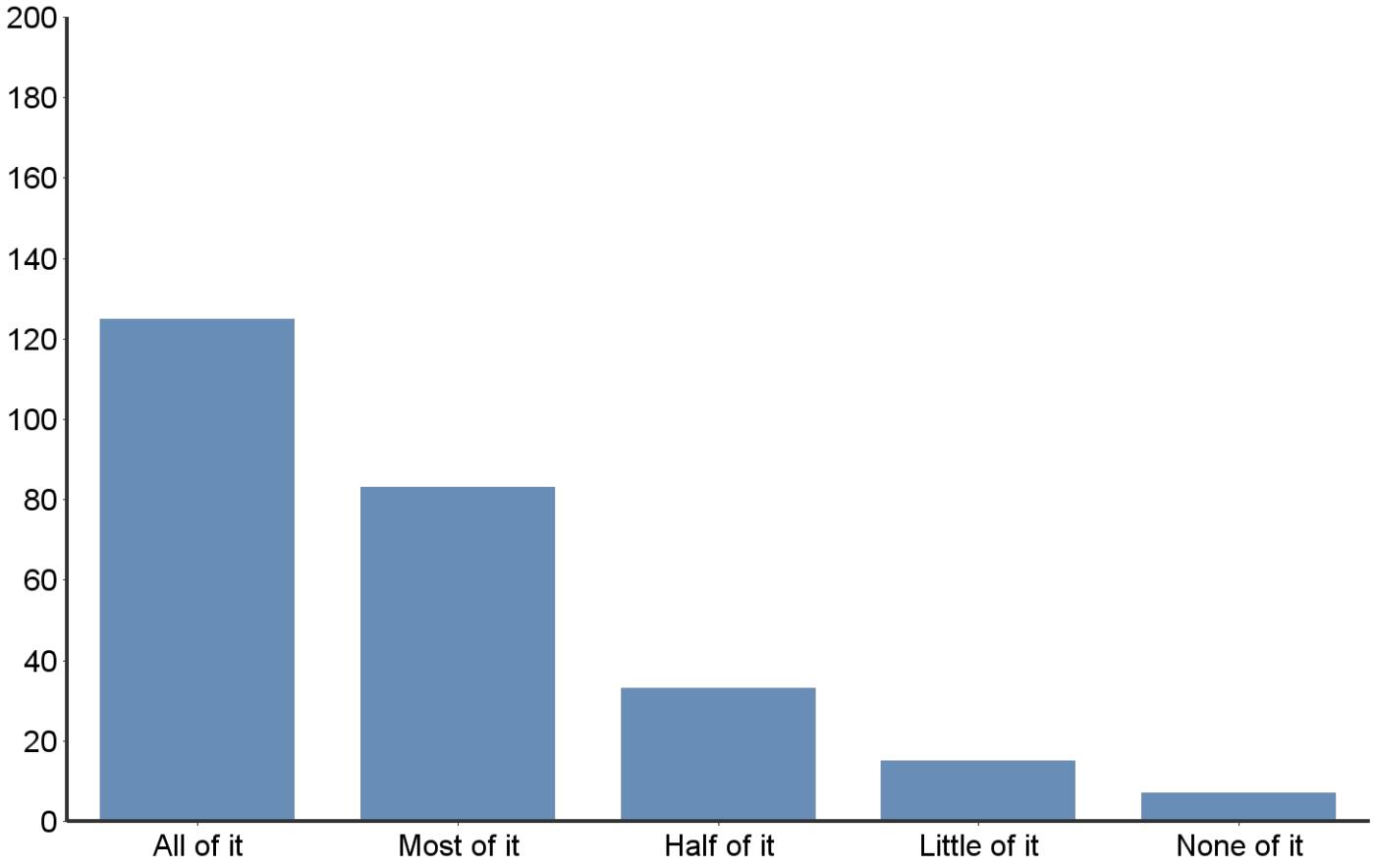
#	Answer	Bar	Response	%
1	At a VM install session or VM office hours		22	8.37%
2	On my own		210	79.85%
3	With help from a friend		5	1.90%
4	With help from a TA or Instructor		24	9.13%
5	Other		2	0.76%
	Total		263	100.00%

Have you gotten help related to using the VM this semester (not counting initial install help)?



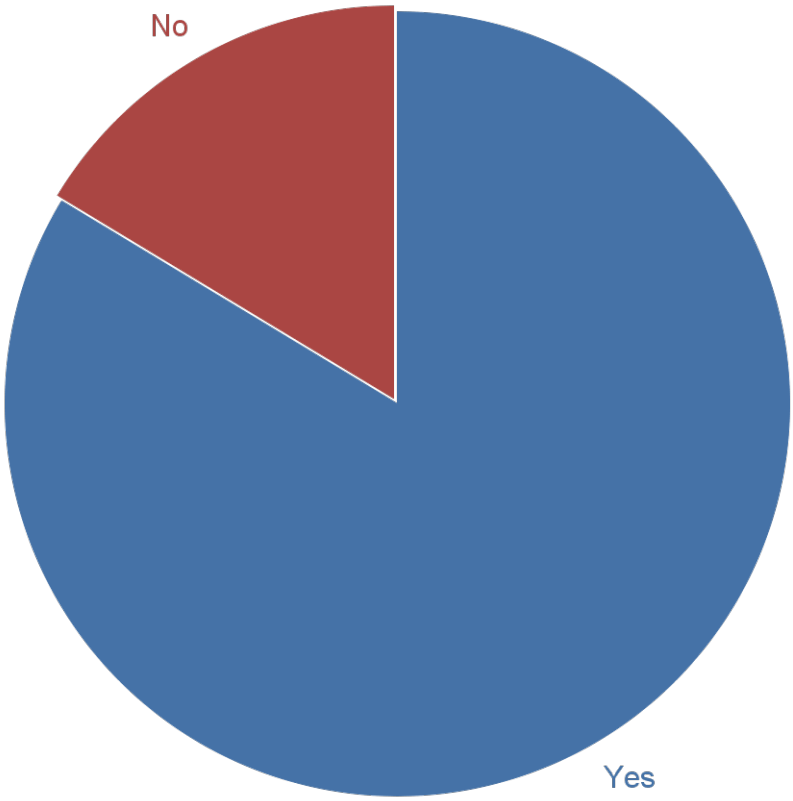
#	Answer	Bar	Response	%
1	Yes		54	20.53%
2	No		209	79.47%
	Total		263	100.00%

How much of your CS coursework do you complete on the VM?



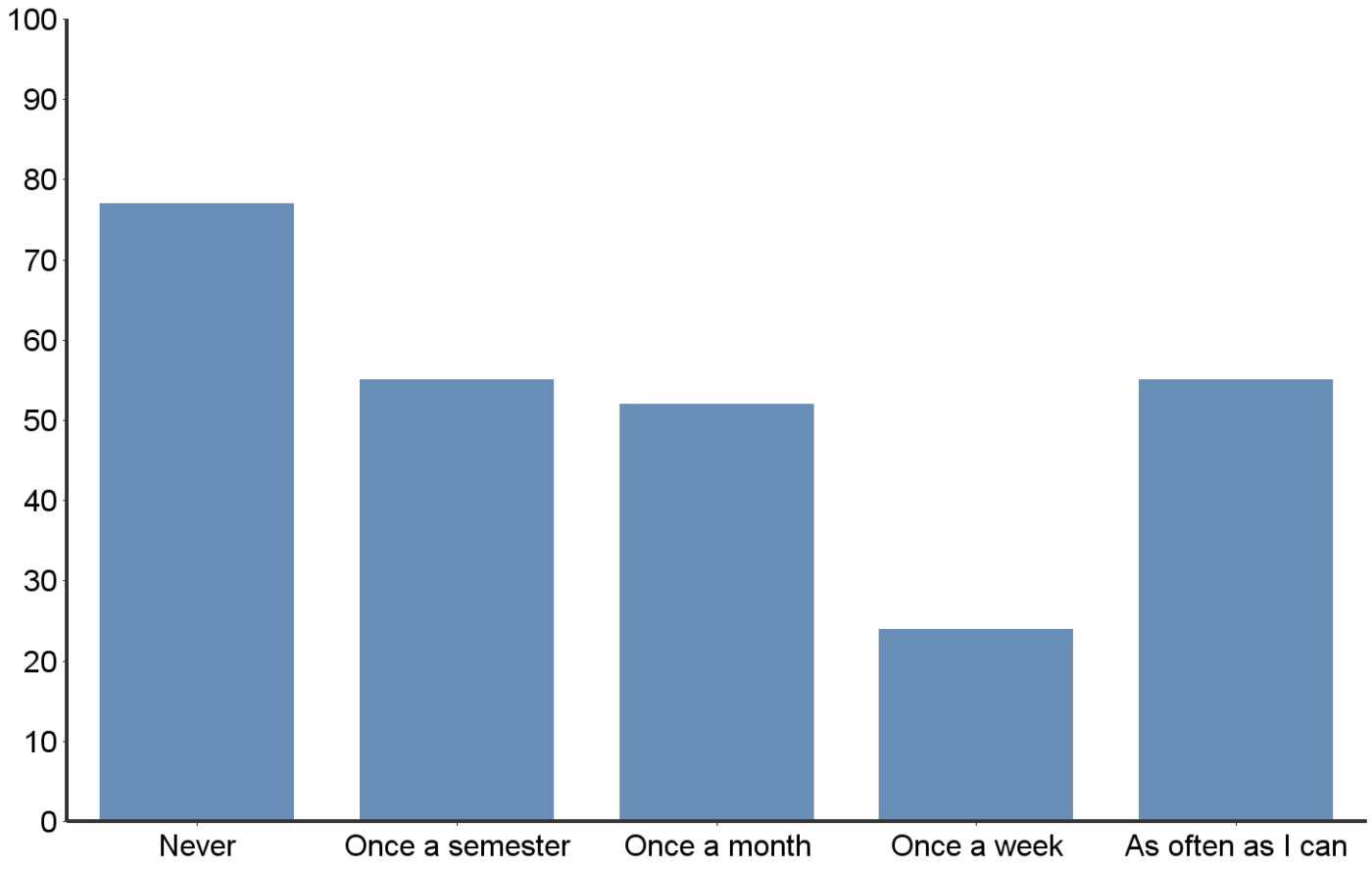
#	Answer	Bar	Response	%
1	All of it		125	47.53%
2	Most of it		83	31.56%
3	Half of it		33	12.55%
4	Little of it		15	5.70%
5	None of it		7	2.66%
	Total		263	100.00%

Do you use Dropbox on the VM to store or backup your work?



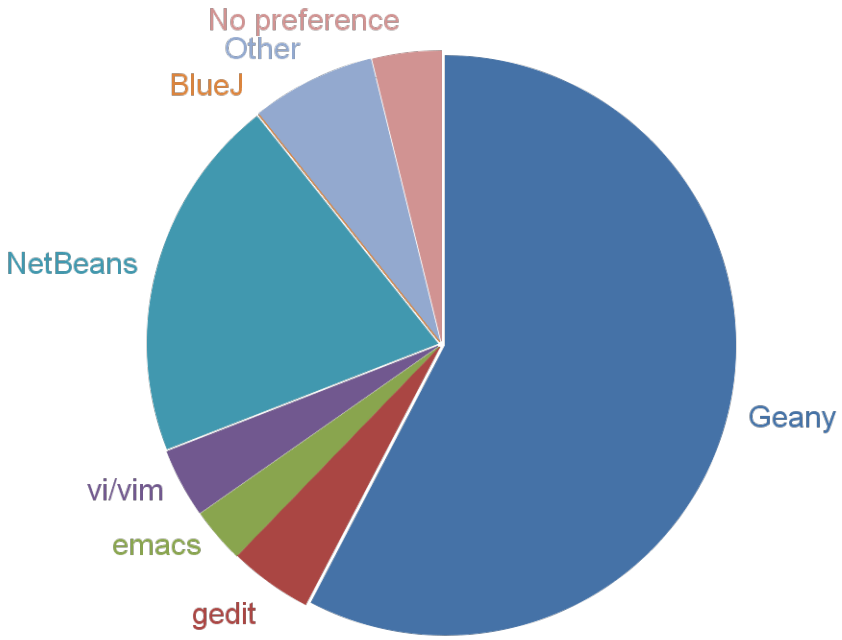
#	Answer	Bar	Response	%
1	Yes		220	83.65%
2	No		43	16.35%
	Total		263	100.00%

About how frequently do you install software updates on the VM?



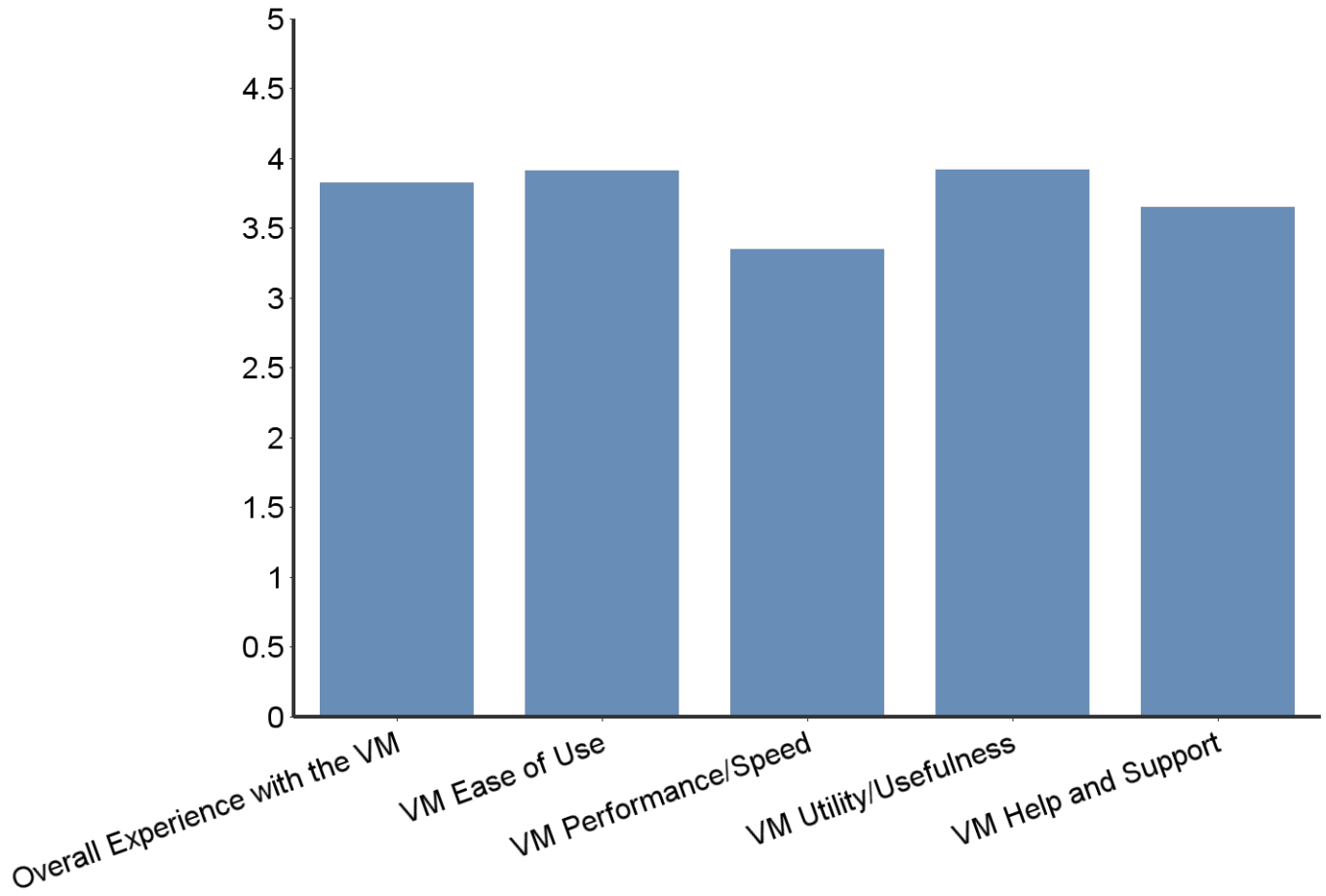
#	Answer	Bar	Response	%
1	Never		77	29.28%
2	Once a semester		55	20.91%
3	Once a month		52	19.77%
4	Once a week		24	9.13%
5	As often as I can		55	20.91%
	Total		263	100.00%

What editor/IDE do you prefer to use on the VM?



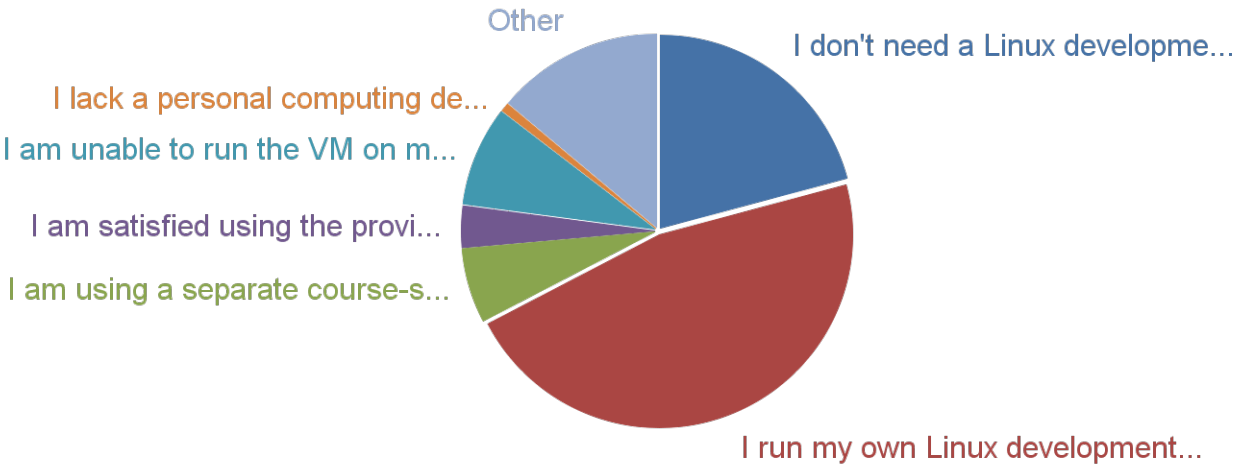
#	Answer	Bar	Response	%
1	Geany		151	57.63%
2	gedit		12	4.58%
3	emacs		8	3.05%
4	vi/vim		10	3.82%
5	NetBeans		53	20.23%
6	BlueJ		0	0.00%
7	Other		18	6.87%
8	No preference		10	3.82%
	Total		262	100.00%

Please rate the following from worst (one star) to best (five stars):



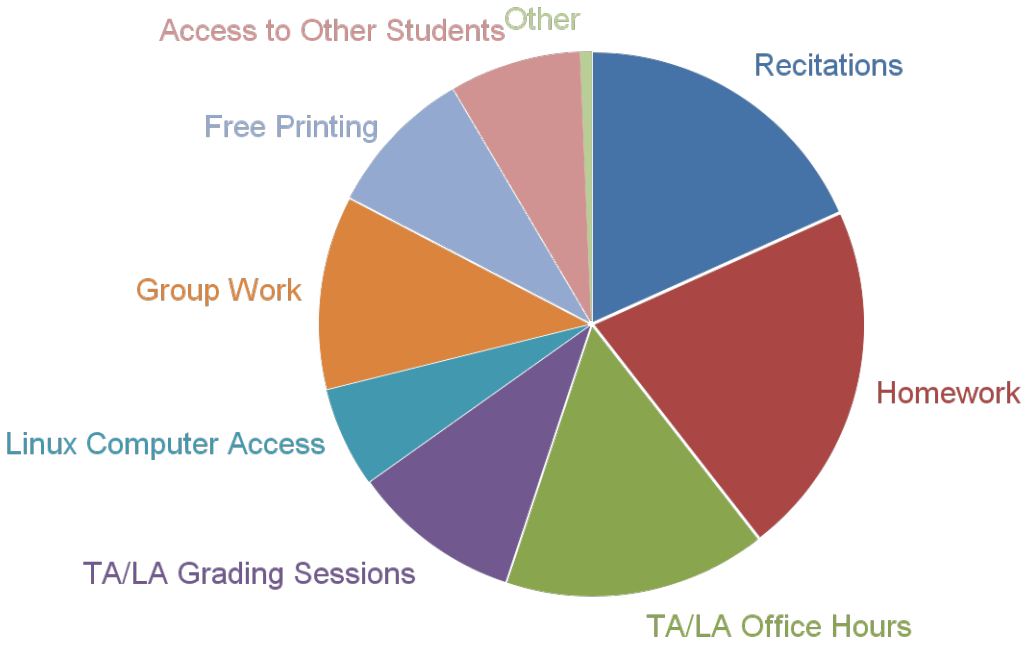
Statistic	Overall Experience with the VM	VM Ease of Use	VM Performance/Speed	VM Utility/Usefulness	VM Help and Support
Min Value	1	1	1	0	1
Max Value	5	5	5	5	5
Mean	3.82	3.92	3.35	3.92	3.65
Variance	0.75	0.88	1.39	1.03	1.24
Standard Deviation	0.87	0.94	1.18	1.01	1.11
Total Responses	249	250	250	251	241
Total Respondents	249	250	250	251	241

Why are you not using the official CU CS VM?



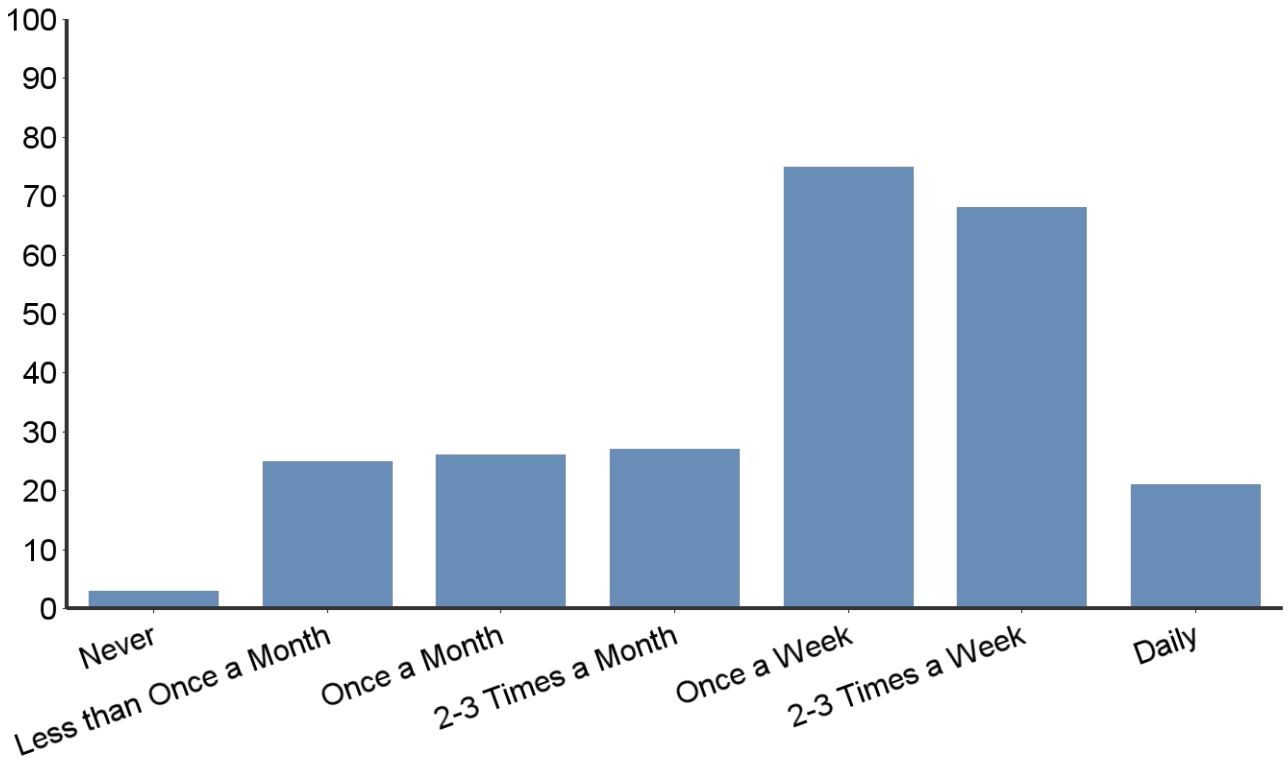
#	Answer	Bar	Response	%
1	I don't need a Linux development environment		30	25.42%
2	I run my own Linux development environment		67	56.78%
3	I am using a separate course-specific VM		9	7.63%
4	I am satisfied using the provided CU Linux labs		5	4.24%
5	I am unable to run the VM on my personal computing device		12	10.17%
6	I lack a personal computing device on which to run the VM		1	0.85%
7	Other		20	16.95%
	Total		144	100.00%

What do you use the CSEL for?



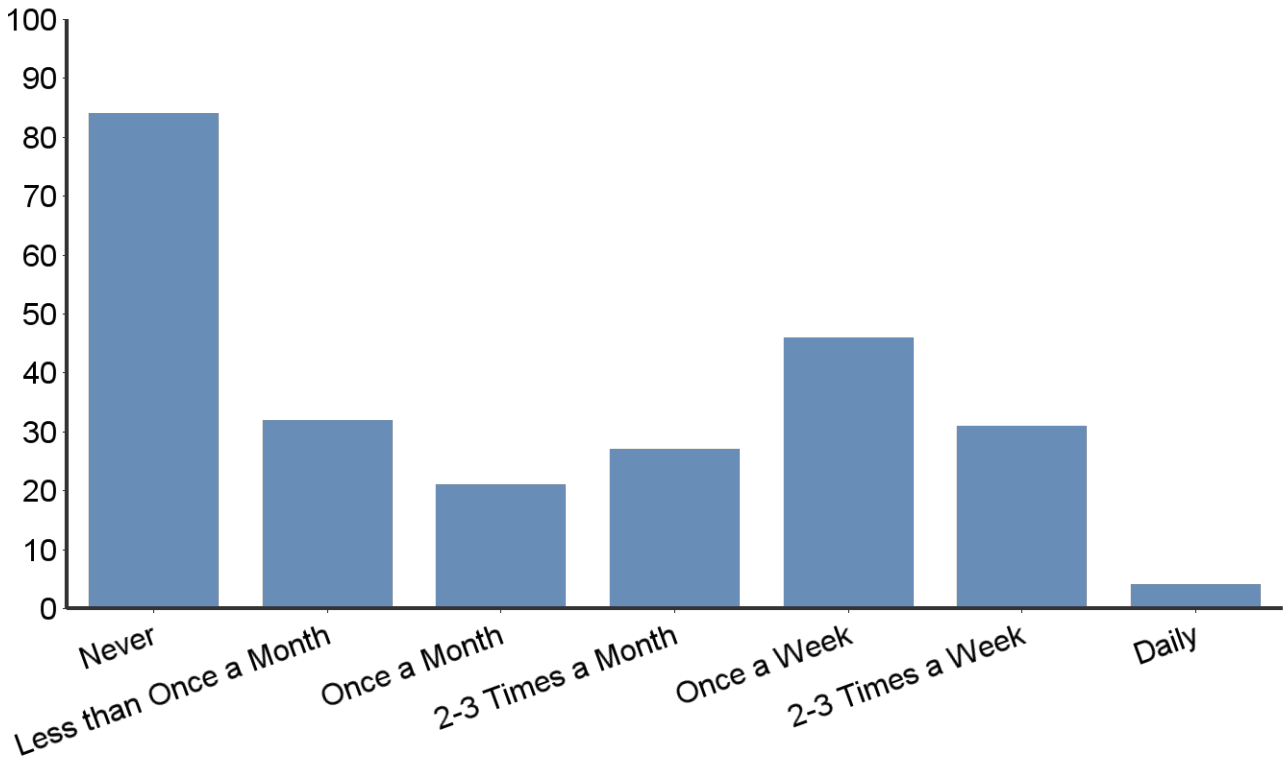
#	Answer	Bar	Response	%
1	Recitations		138	56.33%
2	Homework		160	65.31%
3	TA/LA Office Hours		118	48.16%
4	TA/LA Grading Sessions		76	31.02%
5	Linux Computer Access		45	18.37%
6	Group Work		87	35.51%
7	Free Printing		67	27.35%
8	Access to Other Students		59	24.08%
9	Other		5	2.04%
	Total		755	100.00%

How often do you use the CSEL



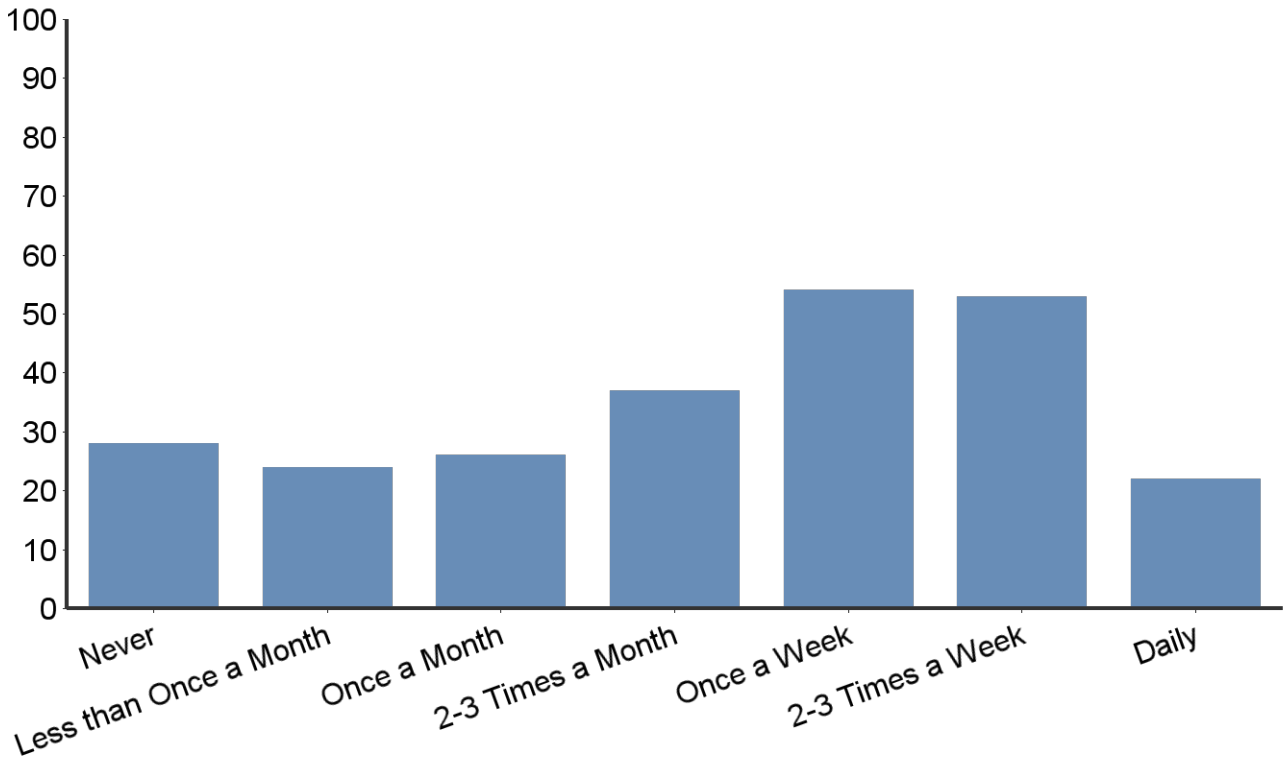
#	Answer	Bar	Response	%
1	Never		3	1.22%
2	Less than Once a Month		25	10.20%
3	Once a Month		26	10.61%
4	2-3 Times a Month		27	11.02%
5	Once a Week		75	30.61%
6	2-3 Times a Week		68	27.76%
7	Daily		21	8.57%
	Total		245	100.00%

How often do you use the desktop computers in the CSEL?



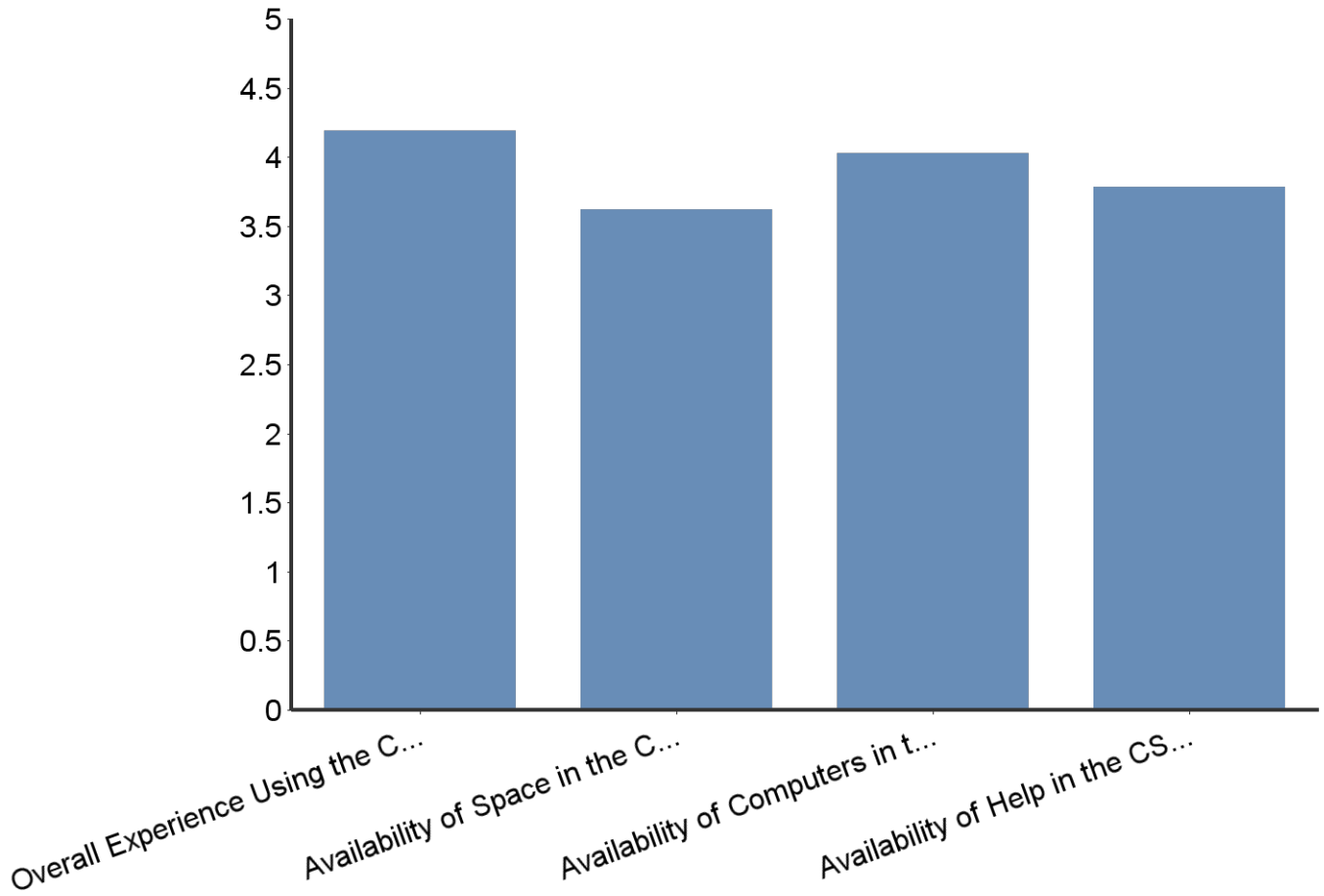
#	Answer	Bar	Response	%
1	Never		84	34.29%
2	Less than Once a Month		32	13.06%
3	Once a Month		21	8.57%
4	2-3 Times a Month		27	11.02%
5	Once a Week		46	18.78%
6	2-3 Times a Week		31	12.65%
7	Daily		4	1.63%
	Total		245	100.00%

How often do you use your laptop or other personal computing device in the CSEL?



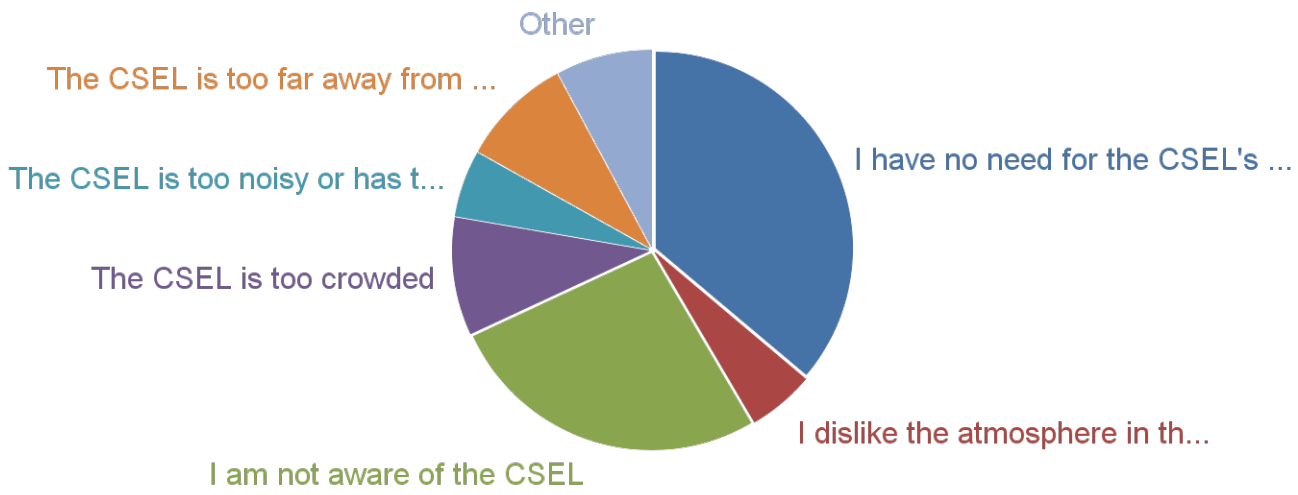
#	Answer	Bar	Response	%
1	Never		28	11.48%
2	Less than Once a Month		24	9.84%
3	Once a Month		26	10.66%
4	2-3 Times a Month		37	15.16%
5	Once a Week		54	22.13%
6	2-3 Times a Week		53	21.72%
7	Daily		22	9.02%
	Total		244	100.00%

Please rate the following from worst (one star) to best (five stars):



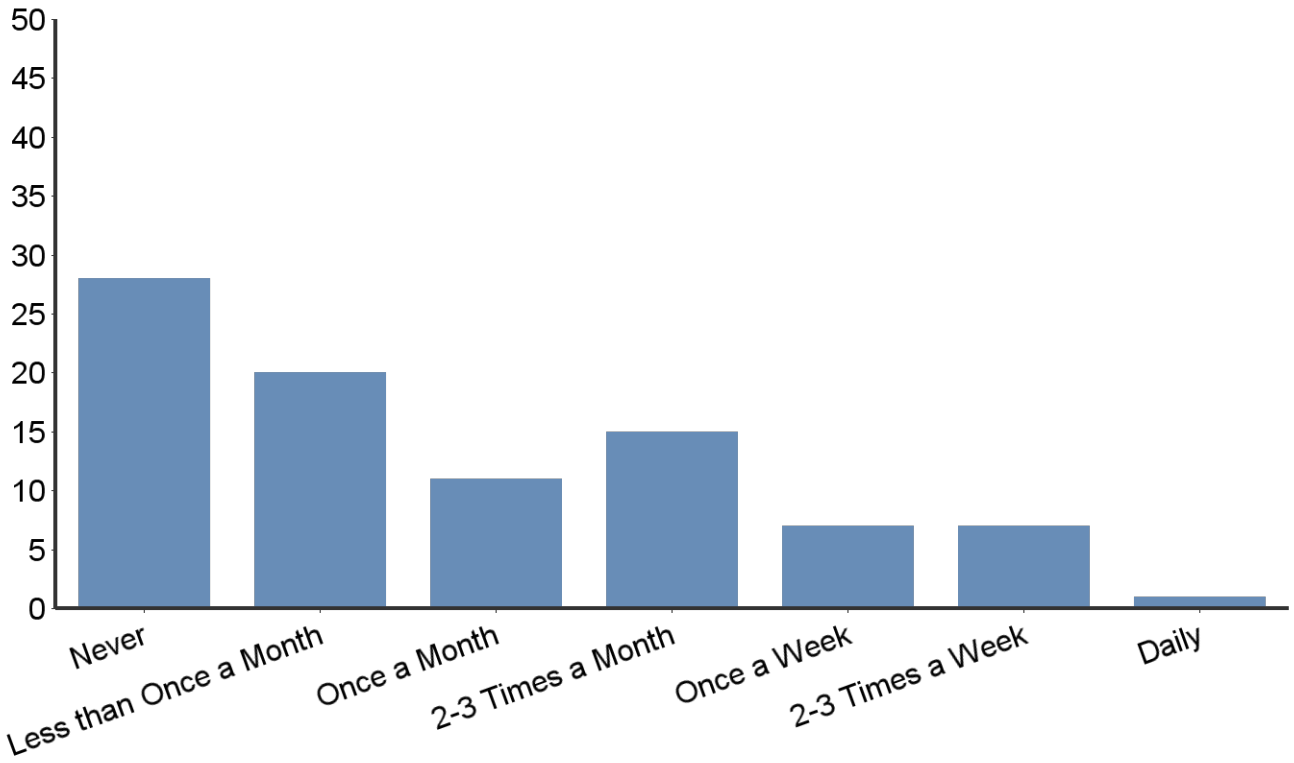
Statistic	Overall Experience Using the CSEL	Availability of Space in the CSEL	Availability of Computers in the CSEL	Availability of Help in the CSEL
Min Value	1	1	1	1
Max Value	5	5	5	5
Mean	4.19	3.62	4.03	3.78
Variance	0.85	1.28	0.96	1.16
Standard Deviation	0.92	1.13	0.98	1.08
Total Responses	238	238	235	236
Total Respondents	238	238	235	236

Why are you not using the CSEL?



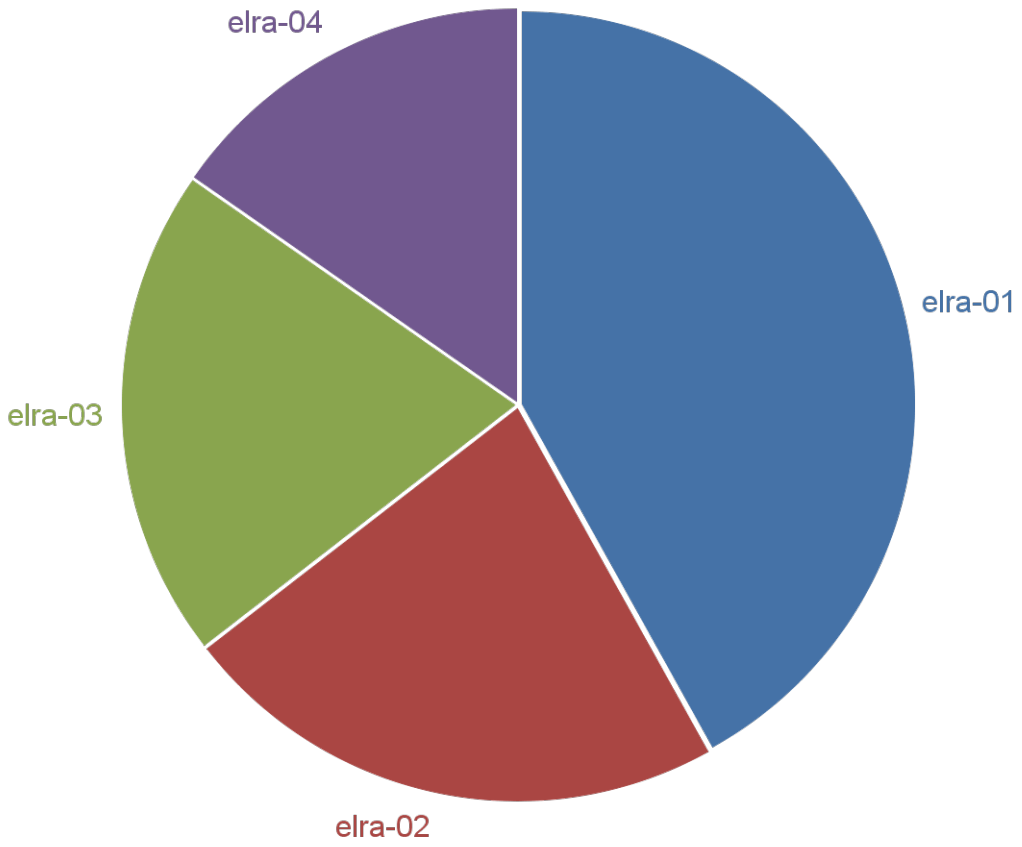
#	Answer	Bar	Response	%
1	I have no need for the CSEL's services		60	47.24%
2	I dislike the atmosphere in the CSEL		9	7.09%
3	I am not aware of the CSEL		44	34.65%
4	The CSEL is too crowded		16	12.60%
5	The CSEL is too noisy or has too many distractions		9	7.09%
6	The CSEL is too far away from where I live/work		15	11.81%
7	Other		13	10.24%
	Total		166	100.00%

How often do you use the ELRA machines?



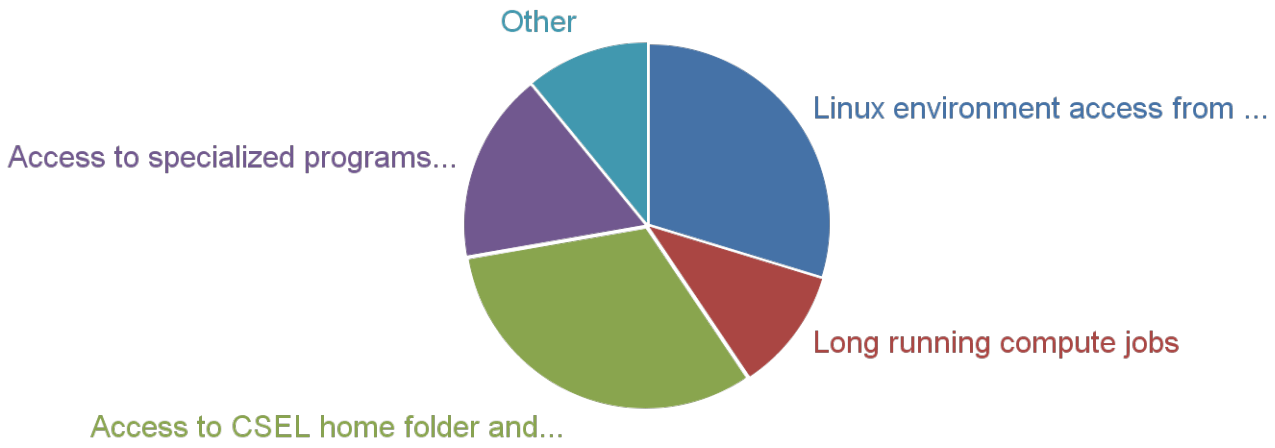
#	Answer	Bar	Response	%
1	Never		28	31.46%
2	Less than Once a Month		20	22.47%
3	Once a Month		11	12.36%
4	2-3 Times a Month		15	16.85%
5	Once a Week		7	7.87%
6	2-3 Times a Week		7	7.87%
7	Daily		1	1.12%
	Total		89	100.00%

Which ELRA machines have you used this semester?



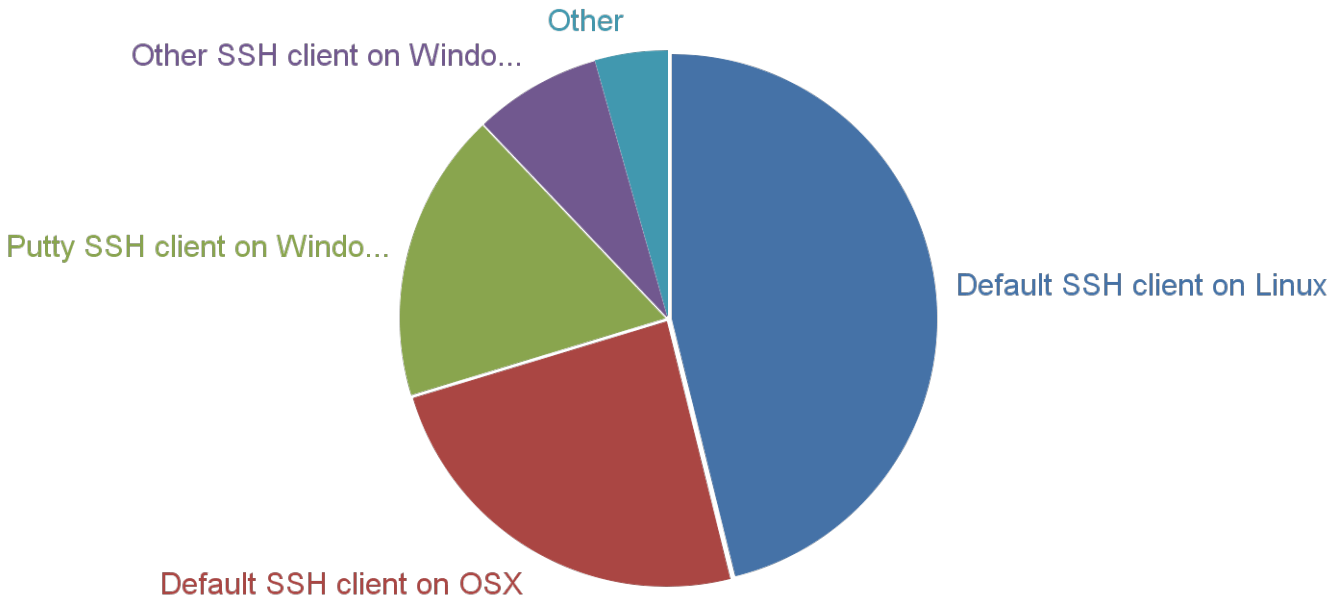
#	Answer	Bar	Response	%
1	elra-01		52	82.54%
2	elra-02		28	44.44%
3	elra-03		25	39.68%
4	elra-04		19	30.16%
	Total		124	100.00%

What do you use the ELRA machines for?



#	Answer	Bar	Response	%
1	Linux environment access from a non-Linux machine		30	46.88%
2	Long running compute jobs		11	17.19%
3	Access to CSEL home folder and file storage		32	50.00%
4	Access to specialized programs (MATLAB, etc)		17	26.56%
5	Other		11	17.19%
	Total		101	100.00%

How do you access the ELRA machines?



#	Answer	Bar	Response	%
1	Default SSH client on Linux		42	64.62%
2	Default SSH client on OSX		22	33.85%
3	Putty SSH client on Windows		16	24.62%
4	Other SSH client on Windows		7	10.77%
5	Other		4	6.15%
	Total		91	100.00%

C Data Report - Comments

Report Attached

Please rate the following from worst (one star) to best (five stars):

Statistic	Overall Experience with the VM	VM Ease of Use	VM Performance/Speed	VM Utility/Usefulness	VM Help and Support
Min Value	1	1	1	0	1
Max Value	5	5	5	5	5
Mean	3.82	3.92	3.35	3.92	3.65
Variance	0.75	0.88	1.39	1.03	1.24
Standard Deviation	0.87	0.94	1.18	1.01	1.11
Total Responses	249	250	250	251	241
Total Respondents	249	250	250	251	241

**I would change the following in the VM:
(Optional)**

There is a lag between saving something on my dropbox on the vm side and that save happening actually and being able to access on other machines. What's up with that? That's dumb. Also
Disable dropbox - you end up replicating your data inside the VM and outside the VM Disable update daemon - if you update a package (like ruby for 3308), you have to downgrade the entire VM Please give me gnome. Please? I can install it, bul hate having to reconfigure the VM every time Build in connection to CSEL CUPS server to allow printing from the VM.
Try a Xubuntu install. It's lighter.
I continued to have problems with one of the updates to get sound on the VM - crashed after the update. So I couldn't use netbeans on the vm and I had to revert to an earlier version of the vm and NEVER update ti. I managed to work around this problem fine but it was a hassle. Otherwise, vm worked great.
Great VM
Add more than 30GB
The method of obtaining the VM (we all did torrent/direct). It took a long time, and the TA was swamped with helping kids, so I wound up doing it myself.
Your Stars don't work on Chrome, windows 7 64-bit
Lower default RAM usage.
Make it more user friendly for people that don't have a good idea of computers yet.
Software and app updating
A better VM
try to make the software as barebones as possible. it eats up a huge chunk of battery life on laptops to run a whole linux session and whatever the laptop has installed. make the vm download barebones, and then suppliment links on how to download specific software that i may or may not use for class. that would shore up any unused software and make the vm faster and use less battery life.
Install SublimeText2 by default and if there is anyway to make it run faster, please do. Also, on the Mac, is there a way to make the left command key the control key for the vm?
Not use it and instead find a IDE for python.
Variants with set IDEs
Only a few options for editor/IDE.
Default browser to Chrome.
I said VM help and support was only a 3 because I've never needed to get any help for it so I can't be certain I know if that's available or not.
If possible, faster boot time would be nice, though it could just be a problem with my laptop.
Revert the VM to the original version provided at the beginning of the semester because it runs faster on systems that have lower available resources.
I would up the speed. I hate using the VM because it is incredibly slow and drains my battery a lot. I ultimately boot camped my mac to ubuntu in order to avoid using it.
Make the mouse work and click where I put the mouse
Use a different linux distribution such as Mint with Cinnamon. Use different VM software such as VMWare, which is more reliable and faster. Add some additional Java IDEs, such as Dr. Java and jGRASP.

Install a scheme interpreter, an R interpreter, maybe some other similar goodies
Occasionally the boot process for the VM leaves me unable to open applications which can be a pain having to reboot so many times.
The VM could use more extensive software libraries and more recent versions of the GCC/Clang.
Try to increase the performance of the VM on more low end machines.
Can it please come with texlive-full installed, please? Or at least texlive-base.
Help students check system capacity/requirements before encouraging hours of pointless download troubleshooting.
I hate Ubuntu's Unity desktop environment, but there's nothing you can do there. I'd also prefer Vmware to Virtualbox.
I hate it
Ubuntu is lame. RHEL 6 or ARCH
Some bios'es have a setting which makes the VM really slow because it prevents the vm from using hardware virtualization. I was able to troubleshoot this on my own last year, but I'm not sure how widely available the info is. If this is a common problem, then it would be helpful if this was discussed on the webpage where the vm can be downloaded.
works fine, do not tell people to use bit torrent that did some funky stuff to my computer.

I have the following problems/complaints regarding the VM: (Optional)

Slow to load, crashes on occasion
I have difficulty updating the software on it
Buggy regarding Full Screen & Seamless Mode sometimes. Lacks some of the more recent Ubuntu enhancements.
Occasional crashing. One instance required a reinstall.
Recommend more RAM as a default, closer to 2 GB instead of the 512. Also make a download and install guide easily accessible on moodle.
It is not usable for graphics class since it can't use the graphics card (without a virtualization layer) as far as I can figure. If dropbox could stop harassing me that'd be nice
Crashed a lot on me for no reason
Deleting all the information on my homework
It runs pretty slow, I often just go to the CSEL and do work there instead because I get too annoyed working with the VM.
This could just be a problem with my particular computer and not so much the VM, but every single Linux kernel since 3.2.54 has not been able to run smoothly. The whole machine takes forever to run anything or recognize input.
Speed
Lack of SSH server/client
None.
It can be very slow and that sometimes creates problems when typing code
Sometimes Dropbox does not sync to the VM, so I have to go through a tedious process of making it work again.
If I leave the VM open and my laptop goes to sleep, when I return to the VM, it is no longer connected to whatever internet connection I was previously connected too and I always have to reboot the VM to access any of the online features. It also runs pretty slow at times, but that may have to do with my laptop.
It often won't context to the internet. And after I updated it the mouse on screen was disconnected from where the computer though it was by half an inch in a different random direction every time I boot up the vm.
Following the distro update, my VM is severly slower to the point where it's unusable even with common current hardware of a intel core i5 and 4gb of ram. The new updated version also causes my system to crash frequently which it never did before all of the updates to incorporate sound and netbeans.
Some pieces of the VM are far too advance for introductory programmers.
Clicks in random location right and to the bottom of where my mouse actually is. It also lags and impedes my work process
The VM is slow, even with a quad-core machine and over time the image becomes slower and slower. VirtualBox can also do some weird things, like constantly loading the VM utilities. It will also sometimes crash for no specific reason. There are fewer issues when running the same operating system with VMWare.
I can't update anything because I don't have admin access.
The new version does not work on my computer and the old version is really slow. Unfortunately, this is a product of having an old machine, I'm sure. Because of this I primarily do my hw in the CSEL on the desktops there.
Certain updates simply would not install and constantly hassled me to install them.

I have to open moodle.com in the VM to be able to download into my Dropbox and use in the VM.
I cant stand it, it is very slow and confusing
I wish we would have gone through a tutorial outlining the basic ccomponents of the VM.
I always have difficulty connecting to a network in the VM. I would make it faster. Also, teachers just throw us into the tool without teaching us about the command line or text editors.
I needed to re-download the VM image twice. It crashed and gave me a blank screen with error when i started it, and never worked again.
There is a lag between saving something on my dropbox on the vm side and that save happening actually and being able to access on other machines. What's up with that? That's dumb. Also, about 4 out of 5 times that I try to start the VM up it comes up with an empty black screen.
Constantly crashes and freezes. Also I have lost some work because it does not actually save to dropbox for some reason.
The Unity desktop evironment is too heavy for VM in my experience. XFCE provides a really light, stable environment to work in and the launcher bar in Unity is incredibly annoying.
problem described above
I don't like how slow it can be. It's also an acquired taste and is hard to learn the linux os.
I ran out of space once I tried to use the virtual machine with large SQL files, and I couldn't find a way to increase the actual storage of the Vm image. I tried cloning it and resizing it, but I ended up with the same amount of space.
I struggled to download the VM originally, because my file corrupted. Then, my laptop died, so I had to download it again, and it wouldn't run correctly on my new PC. The VM froze often,a nd crashed a few times, so I just downloaded NetBeans, and have been using that to complete everything.
It made the rest of my computer run really slow and glitchy until I figured out how to allocate less RAM
The speed of loading
Sometimes the VM is slow or is slow to obtain an internet connection even when my computer is connected.
The VM has trouble reconnecting to a network once it has been disconnected and requires the VM to be restarted.
It sucks
I had 4gb ram at the beginning of the semester. that wasn't enough.
eats up a huge ammount of battery on a laptop.
My original school laptop this semester was a 2011 MacBook Air, and the VM was horrible to use on it. Slow, constant network troubleshooting, and it used ALL of my Air's resources. I started coding in txt files and just checking them on the VM so I could spend as little time on it as possible (and eventually stopped coding all together from the hassle using the VM was, until we began Java with NetBeans).
I couldnt get sound to work, and zipping folders made empty folders when extracted
Installing updates ruined it - never recovered.
That snapshot function deleted alot of my work and it was totally irreversable.
No complaints
After one of the updates I had freezing issues.

I am running Mac OS X 10.5 and sometimes my VM will freeze or crash. Sometimes while opening the VM it will be stuck on the purple screen and will not respond to shutting down.
It is very slow to boot up and shut down and sometimes hangs when I try to shut it down.
My VM would crash frequently and it was hard to me to follow the lectures because at the middle of class, it would crash and I would fall behind
No enough processing power.
Sometimes, the full screen size of the VM shifts and doesn't line up with the cursor on screen and the mouse actually is.
The VM does not import correctly for use with VMWare Player. It would be much appreciated if a version of the VM was prepared for direct use with VMWare.
Not needed.
Says I have 0 memory left
Virtualbox sucks, but again, not your fault.
At times the Dropbox does not work and theVM gets 'confused' and it just kinda stops working.

General VM Comments:
(Optional)

Text Entry
Meh
Nice work overall - using the VM helps keep my primary machine clean when I have to use all the packages.
It works well, but it was hard to install.
I found it difficult to really call the VM my own. Customization is a little difficult, I found.
I like using the vm and the support was great even though I wasn't able to solve the problem.
Its great
Worked fine. I imagine that as I become more experienced in CompSci I will eventually stop using it and just install an IDE on my own OS.
It kills battery life, but its not really a problem.
very helpful .. it can just sometimes be very slow / take a long time to get started.
I'm just picky with the operating system I use. There's nothing particularly wrong with the VM, I just don't like working on a Linux operating system.
WOO
This is a pretty great idea. I like how accessible dropbox is in the VM, and it is a good experience using Linux
great vm. install was smooth and painless on a macbook pro. drains the battery, is slow and unresponsive sometimes, contains a lot of unused software, should link to some sort of linux for beginners tutorial or something of that sort. Overall i had a good experience with the VM, but it needs to be faster and use less battery as i mentioned in the question above.
I do as much programming as I can in Xcode on OS X, and then move it into the VM and make sure it works in Linux. I've done this for Computer Systems, Operating Systems, Computer Performance Modeling, Network Systems and both the computer graphics classes.
Less updating/installing things from command prompt would be a massive improvement
Yeah Ubuntu!!!
Works well to provide an equal experience for everyone.
The VM runs faster and more fluid on my mac laptop. Not sure why.
Install Sublime text editor. It is the "cool new hip" editor nowadays.
The old VM and the new VM should be provided together to accomodate for systems that can't handle the new VM.
Looks pretty coo and some pieces are really helpfulll, relatively confusing as well.
Terrible
Using applications that are natively supported on all three major OSes would be a better solution. For instance, with jGRASP it is possible to program in Python, C/C++, and Java. It is freely available and has a lot of options, yet is not as complicated as NetBeans or Eclipse. http://www.jgrasp.org/index.html
I have never used anything besides the official CU-CS-VM, so I do not have anything to compare it to.

It's an improvement over the environment I coded in for CSCI 1300 in 2011.
I get random update errors and apparently "boot" was zero space now. If I used it more I'm sure this would be a serious problem...
I don't understand the emphasis on VM usage. All programming for this class has been doable on IDLE and NetBeans -- available for all major OSs.
It's worked well since I've been using it, apart from causing some pretty intense slowdown on the host OS (OS X for me) when a session is running. Could easily be my hardware, though.
Thanks for hooking me up with a VM! I knew I would need this eventually! Works great for what I need it for.
NetBeans is confusing at first. There should be an info session on how to use it rather than just diving in and losing a bunch of students.
Its horribly slow and confusing
General? I thought it was a Kernel!

Please rate the following from worst (one star) to best (five stars):

Statistic	Overall Experience Using the CSEL	Availability of Space in the CSEL	Availability of Computers in the CSEL	Availability of Help in the CSEL
Min Value	1	1	1	1
Max Value	5	5	5	5
Mean	4.19	3.62	4.03	3.78
Variance	0.85	1.28	0.96	1.16
Standard Deviation	0.92	1.13	0.98	1.08
Total Responses	238	238	235	236
Total Respondents	238	238	235	236

I would change the following in the CSEL:
(Optional)

Give us an endless supply of whiteboard markers. Everytime I reach for a marker, it's dead. I'm still not sure what system to use (besides the honor system) to allow marker usage without stealing, but it would just be helpful to have more whiteboard markers. I know this would be expensive, but worth it - change out the florescent lights for something else. Something easier on the eyes.
Wish we had more TA's that were a little more helpful.
more space needed for people with their own laptops
There needs to be more space I feel like. I mean, for the most part, it doesn't get crowded, but lately it's kind of overrun. People also need to learn to clean up their trash when their done. The help there, at least for CSCI2270, is great. There is always someone there to help. It's just the space, but only sometimes. Overall, it's a great place to work :)
It would be more helpful if it was more obvious who is an LA/Ta in the CSEL.
Make it bigger--but I suppose that's not really feasible. Maybe set up more tables?
Not quite enough space.
Stars above don't work on Chrome, windows 7 64-bit With the additional Arts and Science students, it is starting to feel really cramped. Some addition of space would be wonderful. More couches for group discussion. The CSCI continuous discussion in CSEL is one of my favorite parts about being a Computer Science major. I am always able to find advice and help on specific topics from others more knowledgeable than myself, and provide my experiences when helpful.
more space would be greatly appreciated
More work space. When help hours for the beginning CSCI classes are going, it's difficult to find a place to work.
Remove office hours from the CSEL, it's too crowded
If at all possible, having more points where people could connect their laptops to the network to take advantage of the internet speeds without taking space by the desktop computers.
It is often very dificult to get time with a TA/LA as there are often close to a dozen people from each class in csel at a time, having two TAs or LAs in the csel at a time for each class would improve this.
Make it bigger, more comfortable!!!
Cleaner
Make more space to study and find a way to keep parts of the CSEL quiet.
I wish that it were easier to change my shell. I had to request a shell change from Matt, the admin, because this info is stored in LDAP and I cannot update it myself.
Make a new one that is bigger
It is very small and during busy times it can become a total zoo. So I wish it could be bigger but that's not an easy thing to change.
It can be very noisy with people talking. Perhaps implement an area that is more like a libray where people have to talk quietly.
A lot of lower level CS class professors hold office hours in the csel, and that usually makes the place way, way too crowded
have more people available to help students. I am shy and so it is hard for me to ask someone I don't know for help. Most likely a personal problem but it would be nice to have more friendly people around. Edit: have more NICE people available for help
It would be nice to have available hdmi's going from the monitors to use the desktop monitors as primary/secondary displays. Also, add a coffee machine!!!
More ta/la please! I'm usually waiting half an hour just to get a simple question answered.

We need more space. Especially since enrollment has been up and we've added the BA in CS, more and more students are using the CSEL as study, meeting, or leisure space. It is always crowded and I've often had to find alternative places to study, since there would be no where to sit or plugin my laptop. I'm not sure if this is a possibility, but maybe a Linux lab can be added to the new Idea Forge in the Fleming Building, then the computer lab in the CSEL can be used as more study/meeting space for students.
The new couches are awesome, thanks for replacing the old ones! But we don't need to waste money on new desktops and screens every year. I would be nice to have bigger monitors, like Dell U3011 or U3014 instead of getting new desktops. I find that I have never needed the power that the csel computers have for the course work I've taken.
Upgrade the hardware in our machines to better run our code.
Have help available for random coding questions, not just specific HW help.
Add outlets for laptops
people who are there to help in shirts that indicate such
Make sure TA/LA are wearing name tags because students don't know who can help them unless they have already met them.
Cleaned more often. Also, we need water to drink.
I sometimes don't know who is a TA/LA. These people (as well as anybody who wants to) should make themselves more available to help others.
Less neckbeards.
more tables without computers
Make it bigger/ add another one. This semester (Fall 2013) has had a ton of students in the CSEL all the time.
-More space! It is super crowded this semester with the new BA. -More empty tables - most of the workspace is taken up with the desktops that I don't see being used as much. -Make it so the monitors/keyboard can be hooked into my laptop as opposed to locked to the PC I don't use -POWER! It is really hard to find a place to work that has easy access to a power plug for a laptop. Standing on chairs to reach stuff in the ceiling or crawling under desks doesn't make my day happy. -Break out space - small 4-6 person rooms where group work could be done -Projector/TV in the conference room at a minimum - it is really hard to do a presentation/group work with everyone hunched over 1 laptop -reservation system for students to be able to book a small group room, or the conference room -Not gonna happen but it would be nice to have natural light. Once you enter that wing for class in the basement/CSEL for work, you can go all day without seeing the outside. Really soul sucking. -Allow us to print from our laptop to the printer. -There seems to be good help for the intro classes, but no assistance with 3000/4000 courses. If the goal is to understand and complete assignments effectively so we understand the concepts, assistance should be available at all levels.
make a window ;)
N/A: I didn't use the CSEL enough to make any fair judgements.
It can get very crammed ... especially during office hours. If there were anyway to increase capacity (the board room area seems relatively unused... but the big table is inconvenient) that would be helpful.
I would like the ability to print from my Linux laptop to the CSEL printer when I'm in CSEL.
the weeks that assignments are due on wednesday and thursday the CSEL is packed and there are not enought TA's or LA's to help. you can ask one question and then not see a TA again for a half hour. Put more TA's in the CSEL on wednesday's and thursday's to allow for more people to be seen.
Have a quiet area, because man nerds get loud. Also maybe have help hours elsewhere because there's no room every time a data structures assignment is due, and it's only gonna get worse with the BA
Markers for use on the whiteboards (usually there are none present) Projector in the CSEL conference room (especially for team collaboration meetings) Consider having more whiteboards!
More room is quickly becoming a necessity I think.
I'd make it bigger, I'd add more furniture, and I'd put some non-Linux machines in it.
Nothing really to change. Just TA's with a lot of people who need help and nobody that can help.
I could improve the WiFi (I realize this isn't very practical)
Windows to the outside world. The other cs kids can deal with it; We need natural sunlight to improve productivity, well being and it's sooooooooo cold all the time. Also some plants would be nifty.

Layout of the Chairs / Tables.
There really needs to be a larger common area, its usually packed with students which deters me from coming in and getting help or just working on homework.
The general layout is very crowded
Aside from general desktop-environment-fanboyism (why isn't everyone running KDE?), I can't think of anything in particular I'd change.
Add ability to dock computers to the monitors and keyboards there
I would ask for more LA's or TA's working at a time. If there were more people in there, I don't think that there would be enough people to help everyone.
more space
I think that having more desktop computers in the CSEL would be more useful than all the couch space that's there now.
More computers if possible.
More space, both in terms of workspace and lounge space, would probably better serve the CSEL's users.
To be honest, I just wish it was a little larger.
Organization. When I was a freshman, I found it intimidating and confusing where to get help and from who.
More whiteboards and more power outlets.
N/A
The LAs should not focus on one student all the time when others need help on a project.
I'm not sure how often some of the furniture is cleaned, clean is nice.
Now that the Macs have been removed from this side of campus, how about putting some in the CSEL?

I have the following problems/complaints regarding the CSEL: (Optional)

needs windows to outside...er natural light.
Some TA's (not naming them) lack the skills required to help others. Some are just plain weird to talk to and hard to approach..
There's always some kid whistling in there. But that's not really you guys' fault.
Computers aren't very reliable.
The TV is never used, maybe show off old Senior Projects, or make it really easy to display to via a website for code-jamming/work/review, or someway of allowing students to show off their current work? Seems like something could be put on it
sometimes the LA or TA will be held up by one student for extended periods of time, and other times i personally have had the TA or LA not spend nearly enough time with me
It gets pretty loud in the main room sometimes, but that's unavoidable.
Too small, usually packed.
It's dirty, couches especially
The noise can make it hard to concentrate. Sometimes it's people working on assignments, other times it's people talking about other things, sometimes nothing related to CS.
The computers often freeze
People are bad at keeping it clean or when they are good about throwing trash away the trash bins get full quickly
When its crowded, ITS CROWNED ALRIGHT
Not enough TA/LA for certain courses
There's not enough markers for the whiteboard or erasers. Add a shelf and/or cabinet to house supplies relevant to the whiteboard. There needs to be a stock of paper next to the printer because it frequently runs out of paper and doesn't get refilled for more than a day or so.
It's bloody loud all the time. But it's supposed to be aspace for that ;)
When it gets crowded with too many students, the WiFi signal will take a long time to connect, or it will disconnect completely.
I couldn't use the CSEL desktops for my SAAS class with ruby on rails. This made recitation much more difficult
none
It's freezing. There is a parsity of whiteboard markers. It should be easier to project from a laptop/desktop screen. All this handwriting of code is sometimes tiresome/ineffective/unproductive.
Unnecessary for recitation - nothing can be done on the desktops.without the VM
I had one desktop freeze in the middle of lab, lost some code. Besides that, great job guys!
The asshole who seems to think it's cool to whistle jaunty toons while the rest of us work from time to time. I know this doesn't help you at all, so sorry about that, but seriously, fuck that guy. Also sometimes it's hard to tell who is and isn't a TA or LA.
more people available to help
TA/LA don't wear name tags

Neckbeards.
I can hardly get my laptop to connect to the wifi in the CSEL. I have no other problems anywhere on campus. Too much noise (personal complaint)
The lighting is too dim (Jk, I am blind.) I have no complaints.
not enought ta's on wednesdays and thursdays.
Printer only works sometimes
Often there are times where all machines in the lab are occupied.
CSEL needs more space and more furniture. It used to be a pretty decent place to go and hang out and due, but the reality is this semester it is entirely too crowded to be both a computer lab and a lounge. The Circuits Lab that the EE department has set aside is easily twice the size of CSEL and has much more equipment and places to sit. Compounding the problem is the fact that the furniture in CSEL is tremendously wasteful of the space that's available. The computers are also a gigantic pain in the ass to work with. Part of this is that they are network booting, part of this is that they are poorly configured, and part of this is that they aren't up to date. The network booting makes them run way slower than necessary. The poorly configured makes them incredibly annoying to deal with - for instance, at least last semester I ran into an issue where the computers couldn't print images because of a misconfiguration for the printer.
With the added Arts & Sciences students CSEL is packed this year. I've been using CSEL for ~3 years now and I've never seen it so busy. It is difficult to find space for a group in CSEL so we often venture to ITLL or DLC for group rooms, and I try to avoid working in CSEL primarily because it is so busy and crowded.
Many of the computers I've used do not have git installed, and so it makes it difficult to develop on them. I usually have to bring my own laptop because I need git.
The WiFi is spotty.
The level of filth is atrocious. Food and dirt everywhere, you'd think we work in a Frat house...
Some people go there and don't do homework. Can get a little loud.
It's pretty crowded and generally loud in the CSEL. I only really go in there if I'm absolutely stuck on something.
I had serious issues with the locale on the machines— no non-ASCII characters were recognized by either gnome-terminal or xterm regardless of what flags I ran them with, variables I set, etc, etc., which is somewhat irritating since I use several non-ASCII characters in my bash prompt and my vim setup.
not enough space
Because of the increase in computer science undergraduate students, I found that it's really hard to find a free space these days during the afternoon.
The printer doesn't work very well...
Sometimes it gets too noisy to work in there.
It may seem petty, but the dry erase markers in the csel seem to ALWAYS be on their last legs. The whiteboards are EXTREMELY helpful right from 1300 on, so it seems silly to me that such a great resource is needlessly crippled.
There has been a couple times that there hasn't been an LA or TA in the help lab when the schedule said there should have been. During those times, I had specific questions and no support in order to ensure my understanding. Very frustrating.
When you're working late and not many people are in there you have to keep throwing things at the lights to trigger them back on.
N/A
Really noisey a lot of the time. There are groups that hang out and just chat rather than actually working on projects. This is cool, but can be distracting as they get louder and louder.
I never able to get any help. Most of the computer science projects makes no sense at all. Since I am not getting any help, not only I am failing the class, but I can't even understand the mistakes I made.
Printing availability (paper is often out).

General CSEL Comments (Optional)

Its nice having a space to work where others are working on the same thing. Also a good noise level for focusing or group projects.
Nice work on the CSEL in general. It's a great place to go to hang out and work with my colleagues.
It would be nice to have a command line print that would be usable over ssh.
Comfy couches.
Really good resource and place to do homework and other CS work
It helps being around everyone working on CS assignments. It's definitely a useful tool that I need to utilize more often!
Make another CSEL
It's a good place where a lot of work can be done. It has helped me find people to work with and it's good to have a place to work.
Great collaborative environment, easy to find kind people who are eager to help with problems.
Its a great environment for random meeting with other people Computer Science classes to get help or to just bounce ideas around.
As I stated above, spend a ton of time in CSEL. It is a wonderful environment, could use a more thorough cleaning on occasion.
More couches in the secondary (less loud) room would be nice
should split up sections into what class you are in. ie, 1300 sits in a different section than 2270 and so on. that way 1300 students could work together while the TA's are answering other questions and the students can continue to work ahead without the TA's help.
The csel is a good resource, however more space is needed with the higher enrollment
Great environment for group interactions
I like the new couches!
To put it mildly, I actively avoid CSEL these days. It's nearly impossible to find a place to work, half of the people there are trying to work and the other half are just being social (and usually loud), and unless I absolutely need the computers there I would rather use any other computer lab on campus to get work done.
I love the whiteboards and think it is a great environment for getting work done.
Matt Monaco is pretty awesome at admining the CSEL - he always installs software that I would like to have :)
Nice facility, I used the computers a lot in the beginning for my Python assignments before I found out how to use Python on my computer without the CS VM.
Nice place, I like the machines
I absolutely love the lab, and its great to have a place to go where everyone is focused on programming.
CSEL IS AWESOME!!!
A window or two to the outside world would be lovely.

It seems like a great place to work. Though I have felt the need for help, I haven't gone to the CSEL for that reason.
The CSEL is great! And Andy is very helpful and knowledgeable.
I think it would be better if TAs for some classes can find other rooms to use as office hour instead of the sitting area for CSEL (like ECCS102, 122).
Nice new couches
Bigger monitors instead of faster computers.
N/A
when i do get help it is useful
I'm extremely glad to have access to the csel, as it provides an excellent on-campus home base for pretty much everything in the major. More and bigger, please!
I should probably use it more.
It is only a good place to go if someone needs a computer to work on their projects.
Seems like an undergraduate space. As a grad student who is not a TA, it feels a little strange to be in there.

Any Final General Comments:
(Optional)

You're awesome, Andy Sayler :)
THIS CLASS IS TOO EASY
Stop using vitual box, and get VMware or something.
its hard to get in if your forget your buffone
Go CS!
CS lab is kind of hot and gross
It would be awesome if the CS department helped fund its students to buy laptops or supplied them with loaner laptops! That would be expensive though.
Computer Science is, for the most part, a wonderful community of intelligent students and passionate professors. I am glad to be a part of it.
The availability of computing resources and free software should be advertised to all CS students.
Please allow more help for people that are new epicaly in lecture I end up feeling stupider after lectures and getting more frustrated at this class. This is little help in lecture if you have a question or very behind a little. It is at the point we're class is now more confusing everyday for new than anything else
Thank you for providing the VM, it makes the learning experience much easier as there is no need to download programs to my own system and have to deal with compatibility errors, missing libraries, etc.
the pace started out very comfortably but once the class hit java the new information came at me a little too quickly. the teacher should have laid the foundation of java better in the beginning
The VM should update the gpp compiler it's using. There were some changes from the current version of c to c++11, which has caused some issues with homework.
NOPE
I think requiring students to use a VM is probematic, I know some people use netbooks. My laptop barely has enough memory to run the VM, and it's silly to run Linux on a VM inside the Linux installed on my latptop.
This is my first year at CU and overall I've been very impressed with the CSEL.
The 4 ELRA machines give different behavior for SSH and their (login) parameters seem to change even during a semester making it difficult to write scripts that automatically connect and run tasks/access files.
There are machines in the lab which do not have convenient access to power outlets nearby. This often results in students laying power cables and trying to stretch them to reach an open machine. I'd strongly suggest considering reviewing placement of power outlets throughout the lab, and perhaps having an exposed power strip next to any machines where there are limited number of outlets. Many students either bring their own machine, or collaborate with others who are using CSEL machines, or are looking to plug in a laptop/tablet/phone for charging while using the CSEL machine.
The HW meetings ruined me. They are ridiculous and made me dislike the class tenfold.
Thanks a ton for making the CS BA a thing. It's the reason I'm here still.
Love the CSEL and CS RESOURCES- just wish the CSEL was bigger.
We need more stable professors to teach crucial classes like Unix Admin and OOP. I don't understand how the one fundamental methodology in all of computing can only be taught by a single professor. It's flabbergasting and literally embarrassing that no one else can teach OOP. I get that there's a huge influx from the College of Arts and Crafts, but the rest of us in engineering who've been doing this for a while are getting shafted on core classes that employers require. And I know this isn't about the foundation program, but you know, this is like the only outlet we have to let the department know. We can complain to Lesley but she's doing her best and has no real power for change which is sad but true. The department has drastically declined in excellence and it's disheartening. It's no wonder we rank #34 according to US News and World Report. I'll be graduating without quality knowledge and my degree will be about as useful as a philosophy degree.
linux is the best :)
=)

For CSCI 2400, coverage of reading topics in exercises is good, but some topics still need more assigned exercises that test knowledge. Caching, for instance. Most of the labs do a good job of covering the required topics. Assignments should test/re-enforce the most important material as well as the material that will be covered on the exams.

I LOVE CS

Before I begin, I'm a grad student taking this course for my own personal gain and not as a course requirement. That being said, I think it would be nice if we could get more 1-on-1 time with the professors and TAs. It's difficult with such a large class to have a general discussion or questions about the material when there's a line of students just trying to get their homework done for a grade. While there is absolutely nothing wrong with that, I feel guilty trying to utilize the office hours for general discussion.

I really like the environment, just wished it was a little bigger than it is now

no

It would be nice to have all of the CS files on a NAS [in the CSEL] instead of github to allow for faster access to course files and VMs.

I was confused about what ELRA was at the beginning of this survey

More la/ta in the fish bowl please! I find myself waiting half an hour just to get a single questing answed

I can't see well and nothing disability services can do helps in class.

I enjoy having Linux machines provided by the department that we can ssh into, but I would like to see Windows machines that students can RDP into as well. I know many other computer science departments at other universities offer both, and I think that the business school offers windows machines business students can RDP into. I wanted access to a Windows machines so that I could test RDP. Thanks!

N/A

I like how the computers in the CSEL saves my work and remembers my preferences.

None. :) Good luck smoothing things out in future semesters. A lot of hassle was generating over a seemingly useless VM requisite.

This class has been spectacular. When I started I had no idea what a programming language was, or anything about how computers operate. The only issues I have had with completing my work this semester are due to my own time managment issues. When I put fourth the effort, I learn and understand the concepts pretty easily. You guys do a good job of accomodating people who have no clue what they are doing. It was a pleasant surprise.

Teach Vi/Vim to students, it's way better than geany which is what we were instructed to use for the python sections of the course.

It would be nice to get one-on-one time with TA/LA

Thanks for providing the elra systems!

Yes. VM is bad, switch to Ubunto please. You want to encourage the students to use Linux-based platform. Why not install a Linux OS on the machines and go through a virtual machine. That windows oon the machine is not used and you are paying for it

I wish we could run node.js on the CSEL computers.

It'd be nice for an elective class to go in-depth about web design. Currently the ATLAS courses wouldn't count towards the degree.

Spend more time explaining Java

good department, if I had more time as a music ed major i would be completing the minor.