CSC 120 Lab 06

Instructions: Please provide screenshots for Questions 1,2,3 and 6.

# 1. Question 1 Install VirtualBox on your system. (5 points)

In this exercise you will be installing Virtual Box on your system. (Windows or Mac). After installing VirtualBox you will be using it for installing a linux operating system (Ubuntu) by creating a Virtual Machine in Virtual Box. (Read online about what a virtual machine is).

**VirtualBox Download link** <https://www.virtualbox.org/wiki/Downloads>

**2. Question 2 Install Ubuntu 20.04 as a virtual machine using VirtualBox.**

# (25 points)

**Step 0:** Open VirtualBox on your machine.

**Step 1:** Download the ISO for Ubuntu 20.04 to install it using Virtual Box.

Ubuntu 20.04 ISO Download Link <https://ubuntu.com/download/desktop>

**Step 2:** Read more about what an ISO is below.

**Note:** You just need to download an ISO for this exercise and not burn or mount one. Reading : <https://www.lifewire.com/iso-file-2625923>

**Step 3:** Follow the steps provided in the tutorial below to install Ubuntu 20.04 using VirtualBox.

Ubuntu installation Video link: <https://youtu.be/3qcK_Bwa0sU>

Ubuntu Installation Screenshots Link: <https://itsfoss.com/install-linux-in-virtualbox/>

**Note:** The above tutorial is for installing Ubuntu 17.04, but the steps are still the same.

**Step 4** Paste a screenshot of the virtual machine by opening the terminal and typing “whoami”

A picture containing text, monitor, computer, screenshot

Description automatically generated

# 3. Question 3 Running basic commands on the terminal. Paste the screenshots of the output for each sub-question (30 points)

1. After installing Ubuntu on Virtual Box, open Virtual Box and run the virtual machine using the play button.
2. Then open the terminal by typing terminal in the search box.

|  |  |
| --- | --- |
| If you are unable to install Virtual Box, paste screenshots of the errors. In that case use the | |
| following link to run basic linux commands online |  |

[Run Linux Commands Online](https://cocalc.com/projects/1783e94b-6c31-4ed2-9256-ead03a3f455f/files/Welcome%20to%20CoCalc.term?anonymous=terminal&session=default)

1. Open the terminal and type “mkdir CSC\_!20”. Read more about how to create a directory using mkdir. Paste the screenshot of the command and the output below.

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Description automatically generated

1. Type the “ls” command on the terminal. Then try the “ls -l” command. Read online more about what an ls command is and how to use it. Write a brief answer about how and when to use it.

<https://www.youtube.com/watch?v=dQ8JgDUS8DA> Ls is a linux shell command that lists directory contents of files and directories. To use the ls command, you can type ls in the terminal and this will bring up contents of home directory. Typing “ls -l” list out files in the home directory in long format (gives extra details such as user, size, rights, date, and time).

1. Use the cd command to navigate to the Desktop directory or any other directory of your choice. Read online more about what a cd command is and how to use it. Write a brief answer about how and when to use it.

<https://www.youtube.com/watch?v=FTTr2bjI2UM> The cd command allows you to change your directory. Typing cd followed by a space followed by a character such as ~ will take you to the home directory. Typing “/” will take you to the root directory. And “..” would take you to the parent directory.

1. In Linux based operating systems, there is a command known as “sudo” that gives super user privileges. Read more about the sudo command and summarize your observations.

<https://www.youtube.com/watch?v=NV55X0MvVEo>

Sudo stands for “super user do”. Gives extra privileges to administrator.

1. In order to install software on Ubuntu using the command line, you can use the apt package manager (or apt-get). Read more about installing packages using apt (or apt-get) and install the vlc player on your VM. What was the command that you used/. You will also need to use sudo.

<https://www.youtube.com/watch?v=VTMP1lZCkXs>

Sudo apt-get install vlc

1. Type the pwd command. What is the output. What does the pwd command do?

The output is /home/shawn

Pwd stands for print working directory. This command tells you where in the file system you are currently located.

# 4. Question 4 Exploration (10 points)

Explain the difference between a Virtual Machine and the Host Operating System. Research online about how VM’s are used by technology companies for cloud computing today. Answer in 1-2 paragraphs.

<https://www.vmware.com/topics/glossary/content/virtual-machine> A virtual machine uses software instead of a physical computer to run programs and deploy apps. Virtual machines allow technology companies to run and use one or more virtual networks, different operating systems and applications which improves efficiency.

whhttps://www.jigsawacademy.com/blogs/cloud-computing/virtual-machine-in-cloud-computing The main properties of a virtual machine are end to end isolation (helps in preserving performance at hardware level), hardware independence, quick partitioning (quickly running multiple operating systems on one physical machine), and enabled encapsulation (easily saves entire state of VM to files). Microsoft for example, has a could service provider called Azure which offers a virtual machine service. This allocates many images in the cloud platform and makes the deployment quick and easy.

# 5. Question 5 Conceptual Question

* (+5 points ) Explain the concept of a process. In operating systems.

<https://www.tutorialspoint.com/operating_system/os_processes.htm>

A process is a program in execution. This execution must progress in a sequential fashion. The operating system helps to create, schedule, and terminates various processes used by the CPU.

* (+5 points) What is the distinction between application software and system software? Give an example of each

<https://www.businessinsider.in/difference-between-application-software-and-system-software/articleshow/69523128.cms> Application software helps perform a specific set of functions and is developed in a high-level language. Application software runs as and when the user requests it, is user specific, and is not needed to run the system as a whole. Some examples of application software are photoshop and MS Office.

System software is meant to manage the system and is developed in a low-level language. System software automatically starts running once the system is turned on, a system cannot start without system software. An example of system software is Windows Operating System.

# 6. Question 6 Programming Question (20 points)

Given the string

SCORES = [40,91,85,15]

Write a program to find all the pairs of scores in the above list. The output should be

40,91

40,85

40,15 91.85 91,15

85,15

<https://colab.research.google.com/drive/1bwU7hdwJJPni1Do2faekwrJoKljWJcpX?usp=sharing>

Graphical user interface, text, application, email

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# Extra Credit Challenge Question (20 points)

Given the string,

## s = "i\_love\_programming\_in\_python\_and\_i\_will\_alzways\_program"

**Find all the unique characters in this string. You can use dictionaries or two for loops. A unique character is one which appears only once in the given string. For example, z or v**

https://colab.research.google.com/drive/1szFirnqIkXFIGO8Kci\_AySSC484QJBlQ?usp=sharing Graphical user interface, text, application, email

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# Extra Linux Commands for interested students (No credit)

These questions have been created for students who want to learn more about how to use linux. This will help you become comfortable with the terminal and approve as an asset during system administration work or working on remote servers.

1. Learn how to use the mkdir command to create a directory from terminal
2. Read about man pages and how to use them.
3. Learn how to see the permissions on a file using the ls -l command.
4. Learn how to set permissions on a file using the chmod command.
5. Learn how to copy files from one folder to another using cp.
6. Learn how to move a file or directory from one folder to another using mv command
7. Read more about bash scripting and why it is useful.
8. Read more about using regular expressions.
9. Read more about using the grep command
10. Learn how to use the file command
11. Learn how to use the redirect operator > to redirect the output
12. Learn how to use the pipe operator “!” to chain commands.

**Instructions: Upload the file with the screenshot on Blackboard with your firstname\_lastname.docx**