

King Saud University
College of Computer and Information Sciences
CSC 227: Operating Systems – Spring 2019
Homework 1
Due Date: Sunday 3 March 2019

Part I:

The use of Virtualization nowadays is widespread. A user can run multiple virtual machines with different guest operating systems in one physical machine that's operated by a host operating system.

You are asked to do the following:

- 1- Install Virtual Box, which is a virtual machine manager (VMM). You can find it at <http://www.virtualbox.org/>
- 2- Download and install command-line based Ubuntu Server 4.4 which can be found at <http://people.westminstercollege.edu/faculty/ggagne/osc10e/vm/index.html>
- 3- Follow the provided instruction in the above link to login, and then create a new user and use your first name initial and last name as the username. For example: *Ahamd Alali* would use *aalali* as his username.

Hint: use the following command to create the new user: `sudo adduser aalali`

- 4- Log in as the user you created and use Linux command-line to show the logged in user and the time the system was booted. (*Hint*: you can use the command *who* to obtain such information. To learn more about how to use a Linux command, you can read the man page of that command by executing the following:

`man command`

For example, you can learn how the command *who* works by executing:

`man who`

Write a brief description of about your experience in Part I which include:

- Description of the specifications of your VM including: number of cores, size of RAM, size of hard disk.
- Any difficulties you have faced.

- Screenshots of Step 4.

Part II:

Find the following information about your virtual machine:

- Size of Memory in Kilobytes.
- How much memory is used in Kilobytes.
- How much free space is left in the memory in Kilobytes.
- The size of the swap and how much of the swap space is used in Kilobytes.
- Find 3 processes run by the logged in user, and report **their name, PID, how much memory and CPU percentage** were they using at the time you found them.

(*Hint*: you can use the command **top** to find this information. Lookup its man page to use the appropriate options.)

You MUST Supplement your answer with screenshots with your answer.

Part III:

Using the installed Linux operating system (Part I), write a simple program that uses at least **THREE** types of system calls. Then, use ***ltrace*** with proper parameters to

- Show the list of system calls used.
- Identify one system call for each type of system call you used.

(*Hint*: ask ***ltrace*** to display system calls, and hide library calls)

You MUST Supplement your answer with screenshots with your answer.