# Assignment 1 Answers

## Assignment #1 CS140U Answers

### INSTRUCTIONS:

==========

Question 1

==========

Briefly explain what an Operating System is.

---------- Answer ----------

An operating system is the low-level software that schedules tasks, allocates storage, and handles the interfaces to hardware such as printers, disk drives, screen, keyboard and mouse. For the most part, it is the software layer that does things in the background for users and/or other computer programs being run.

==========

Question 2

==========

What does it mean to say, "UNIX is a multi-user Operating System?"

---------- Answer ----------

Effectively, when we say that UNIX is a multi-user Operating System, we are saying that multiple users, which are often other human operators, can be using the same computer at the same time. In order to preserve this

environment, UNIX has the ability to make both share data as well as keep it private, depending on the desires of each user within the system.

==========

Question 3

==========

What does it mean to say, "UNIX is a multi-tasking Operating System?"

---------- Answer ----------

When we say that UNIX is a multi-tasking Operating System, we effectively mean that a computer running UNIX, is capable of simultaneously running several computer programs or processes at once, by one or more users, including itself.

==========

Question 4

==========

What does it mean to say, "UNIX is a portable Operating System?"

---------- Answer ----------

To say that UNIX is a portable Operating System, simply means that it can be found on many different kinds of machines and their hardware. Moreover, this UNIX Operating System is designed to effectively abstract the details of the underlying hardware.

==========

Question 5

==========

Why is UNIX portable?

---------- Answer ----------

There are a couple of factors that contribute toward the reason of UNIX being portable. Firstly, UNIX was initially developed by researchers who needed a tool to help them with their projects. As a result, this effort was released to universities either for free, or a nominal cost, which certainly gained a lot of attention and momentum. Having a common tool among universities help perpetuate its continued use. So much so, that other students and individuals on the internet began enhancing it, by adding their own tweaks and adjustments. If I were to make an analogy, it is kind of like when you go to a concert and someone begins to toss a beach ball in the air, and people continue to "push" the ball back up and onto someone else, effectively keeping it in motion. Secondly, with other commercial operating systems at the time such as DOS, Microsoft Windows, Apple OS etc., UNIX's cost of effectively costing nothing, added significantly to its popularity. As new/different hardware (computers) became available, the need to keep the popular UNIX system was present and as such, people all over the world helped the cause by helping with the "port" of it to the newer hardware. Also it was written using the high level C programming language.

==========

Question 6

==========

What are the three major components of any UNIX system (UNIX as an Operating System)?

---------- Answer ----------

The three main components of a UNIX Operating System are, The Kernel which is effectively the guts of what the OS uses to perform its tasks, a Development

environment which allows for the recreation and/or alteration of the OS, and finally the commands, which is a library of usefull utilties to interact with the system. Arguably, there is a fourth major component which IMHO, really helped differentiate UNIX from other OS's, and that is the built in documentation. Not only was the source code present for inspection, but user documents for all of the commands themselves, along with the development environment were included as well.

==========

Question 7

==========

What are the names of the two prominent versions of UNIX, according to our text book?

---------- Answer ----------

According to the text book, the two most prominent versions of UNIX begin with a descendent of AT&T's Bell Labs' UNIX System V (SVR4) and the one which was developed at University of California at Berkeley known as the Berkeley Software Distribution (BSD).

==========

Question 8

==========

Who (names) of people who designed the original UNIX?

---------- Answer ----------

Predominately, both Ken Thompson and Dennis Ritchie from AT&T's Bell Labs' research center, designed the original version of UNIX.

==========

Question 9

==========

What are the two different ways in which a user can interact (interface/work) with UNIX?

---------- Answer ----------

There are two ways in which a user can interact with UNIX, via a Text-Driven interface known as a shell, and/or through a Graphical User Interface (GUI) environment similar to Windows or Apple's iOS. Moreover, with regards to the text-driven (shell) method, these interactions can take place either locally on the console of the UNIX server itself, or remotely through the use of an established connection through the use of applications such as telnet/PuTTY.

==========

Question 10

==========

What is a UNIX account?

---------- Answer ----------

A UNIX account is the "credentials" that are given to a user wishing to access the system. With these credentials, a unique identity is established within the system and is used to track ownership of files and computer processes (or resources) that is being used on their behalf. Once established, the account has the ability to interact with the system through a shell.

==========

Question 11

==========

What is the username of the most powerful account in a UNIX system (the superuser)?

---------- Answer ----------

In UNIX, the username "root" without the quotes, is the most powerful account. This account contains the highest level of permissions and privileges within the entire system. As such, it is usually restricted to a very select few individuals.

==========

Question 12

==========

What does it mean to "login" to UNIX? What steps do you usually follow for this procedure?

---------- Answer ----------

To "login" to UNIX, effectively means to begin an interactive session with the Operating System. This can be accomplished by one of three means. The first method, is to simply be at the console, or machine itself that is running the UNIX OS. Usually, this machine will have a keyboard and monitor present and waiting for someone to login. To do this, you would simply enter your established username followed by the password for that account. Alternatively, and perhaps more common, is to create a telnet session with the UNIX computer. This telnet session is a computer program that makes a connection to the computer remotely and very closely matches the input/output that you would see if you were sitting locally to the UNIX machine itself. Lastly, and most common method, is to invoke the use of a terminal emulation

software program such as PuTTY, which not only works like the telnet method mentioned before, but adds alot of features such as logging to your established connection.

==========

Question 13

==========

What is a Shell?

---------- Answer ----------

Quite simply a shell is the interface between the user and the operating system itself. It is a generic name/term that provides a text based interface for the interaction to occur within. Also, it is a high level programming language and a command interpreter

==========

Question 14

==========

What is a login Shell?

---------- Answer ----------

Similar to a shell, the login shell, is a shell process that is run as part of the login sequence that occurs after an user has logged into the system. As part of this process, various customizations can occurr which tailor the environment to that user's preferences. For example, changing the UNIX prompt to include the current date time stamp.

==========

## Question 15

==========

What has to be done to change the terminal emulation if it is not correct?

---------- Answer ----------

To change the terminal emulation if it is not correct [desired], one can make changes to either the UNIX shell they are connected to, or, make changes to the telnet/PuTTY software used which makes the connection. The key to having it successful, or, "correct" is making sure that each side of the connection is using the same settings. In order to change it on the UNIX side of the connection, the environment variable "TERM" (without quotes) needs to be set to a particular terminal emulation value such as "vt100" (without quotes). Effectively, this process is used to negotiate how various input/output operations are processed or translated from one machine to the other.


*Assignment 1 Key*