**TASK # 1:** Answer the following questions.

**PART 1:** In Linux operating system, describe the kernel.

**ANSWER:**

The Linux kernel is the main component of a Linux operating system (OS) and is the core interface between a computer’s hardware and its processes. It communicates between the two, managing resources as efficiently as possible.

The kernel has four jobs:

1. **Memory management:** Keep track of how much memory is used to store what, and where
2. **Process management:** Determine which processes can use the CPU, when, and for how long.
3. **Device drivers:** Act as mediator/interpreter between the hardware and processes
4. **System calls and security:** Receive requests for service from the processes.

**PART # 2:** In Linux desktop environment, describe the benefits of virtual desktops.

**ANSWER:**

Desktop virtualization is an increasingly important technology for many organizations. A virtual desktop or virtual desktop infrastructure (VDI) means that a user’s desktop environment is stored remotely on a server, rather than on a local PC or other client computing device. Desktop virtualization software separates the desktop operating systems, applications and data from the hardware client, storing this “virtual desktop” on a remote server. The remote server that runs and supports virtual desktops uses software called a hypervisor to create a “virtual machine” that simulates the user’s desktop environment and capabilities. In a virtual desktop environment, users access their personal desktop remotely, over the Internet, from any client device.

Desktop virtualization is a valuable technology platform and solves several business problems. With the many benefits desktop virtualization has to offer for an environment, there are four prominent categories that stand out:

1. **Cost Savings**
2. **Simplified Management**
3. **Enhanced Security**
4. **Increased Productivity**

**PART # 3:**  While GUI based tools do exist in Linux, what is the purpose of using the command line interface, i.e. shell?

**ANSWER:**

A Command Line Interface is a powerful way of user interacting with an operating system. One of the first CLIs was the MS-DOS. It was the operating system for the original personal digital computer (PC), which had been built in the 1980s.

Due to the following reasons command line interface are used:

* If the user knows the correct commands then this type of interface can be much faster than any other type of interface.
* This type of interface needs much less memory (Random Access Memory) in order to use compared to other types of user interfaces.
* This type of interface does not use as much CPU processing time as others
* A low resolution, cheaper monitor can be used with this type of interface.
* A CLI does not require Windows to run.

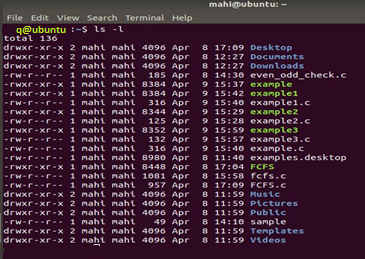
**PART # 4:** Use one of the options with the **ls** command, and describe its usage.

**ANSWER:**

ls command is used to view the contents of a directory. By default, this command will display the contents of your current directory.

To display total information about Files/Directories(ls -l):

**EXAMPLE:**

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**TASK # 2:** By using the command line shell interface, practice the commands given in this lab. Write briefly about the usage of each command.

**ANSWER:**

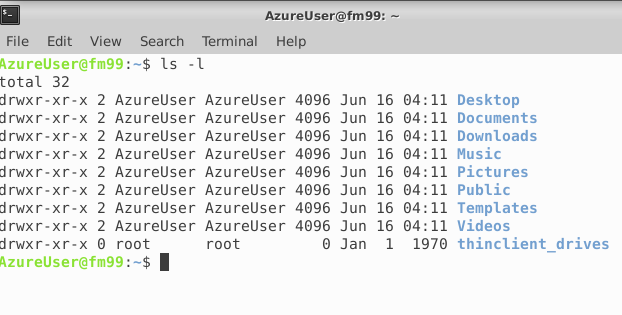
**ls command**:

It is used to list all the contents in the current working directory.

**Syntax:**

$ ls – options <arguments>

**Example:**



**date Command:**

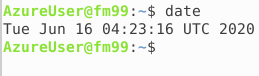
This command is used to display the current date and time.

**Syntax:**

$date

$date +%ch

**Example:**



**echo Command:**

Writes all its parameters to standard output, separated by spaces.

**Syntax:**

$echo –<options>

**Example:**

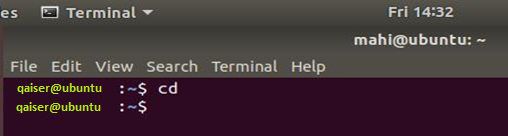
**cd Command:**

Changes the directory.

**Syntax:**

$cd [parameter]

**Example:**



**man Command:**

This command is used to display text-only manual pages.

**Syntax:**

$man –<options>

**Example:**



**clear Command:**

This command is used to clear the terminal screen.

**Syntax:**

$clear

**Example:**

**exit Command:**

Shell sessions can generally be terminated using this command.

**Syntax:**

$exit

**TASK # 3:** By using gedit, open a text editor and write the C program given below. Save the written file as “hello.c”. In order to compile and execute the output file, do the following:

$ gcc - o hello hello.c

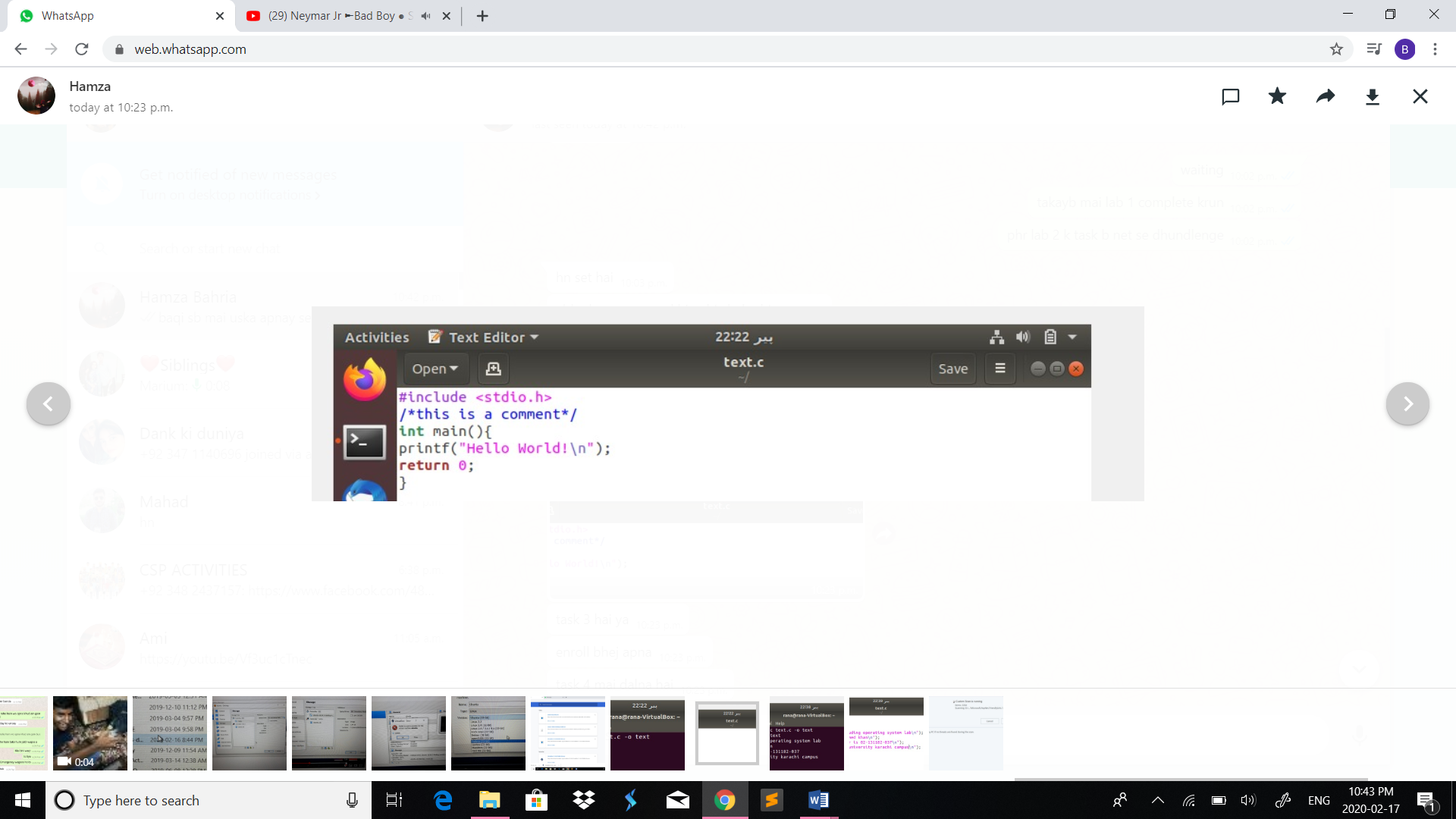
$ ./hello

Write down the output of the program below (provide snapshot).

**Example code:**

|  |
| --- |
| #include <stdio.h>  */\* This is a comment \*/*  int main()  {  printf("Hello world!\n");  return 0;  } |

**SOLUTION:**



#include <stdio.h>

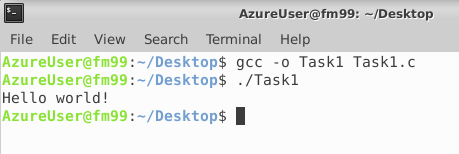
int main()

{

printf("Hello world!\n");

return 0;

}



**TASK # 4:** Make changes within the above program to display a new output text as given below. Write down the developed program.

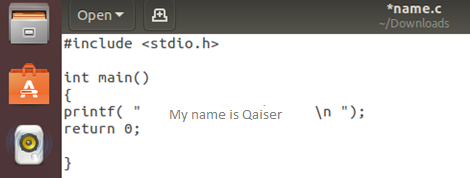
Hello World! I am studying Operating Systems.

My name is “Enter your name”.

My registration number is “Enter your registration number”.

I belong to Bahria University Karachi Campus.

**SOLUTION:**

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