Assignment No 2

Title: Shell Scripting

Theory:

a) What is Shell?

A Shell provides you with an interface to the Unix system. It gathers input from you and executes programs based on that input. When a program finish executing, it displays that program's output. Shell is an environment in which we can run our commands, programs, and shell scripts. There are different flavours of a shell, just as there are different flavours of operating systems. Each flavour of shell has its own set of recognized commands and functions A Shell reads your input after you press Enter. It determines the command you want executed by looking at the first word of your input. A word is an unbroken set of characters. Spaces and tabs separate words.

b) Types of shell

The shell is mainly of two types, then these two types are further categorized; types of shell are:

- Bourne Shell
  - Bourne shell is known as the first shell to be introduced, it is represented by “sh”. This shell got popular because of its quite compact nature.
  - It was made the default shell for the SOLARIS operating system and was used as a Solaris administration script. It has very high-speed operations
  - Bourne’s shell was not able to handle logical and arithmetic operations. It was less interactive because of the lack of comprehensive features. Also, it is not able to recall previously used commands.
  - The Bourne shell can be further divided into 5 types.
    - Bourne shell (sh)
    - Korn Shell (ksh)
    - Bourne Again shell (bash)
    - POSIX shell (sh)

- C Shell ○ The C shell was designed by Bill Joy at the University of California. It is represented using “csh”.
  - The C shell was designed with the purpose of supporting programming languages.
  - It was specifically designed to support in-built features like solving arithmetic operations and syntax of programming languages like C.
  - Unlike Bourne and other Linux shells, the C shell can maintain and history of previously used commands, and those commands can be used whenever required.
  - Shell is the most important and powerful tool in the system. Without a shell, it’s impossible to utilize the system’s features and functionality to its fullest.

Code:

2a) Write a shell script to check user is root user or not.

```
#!/bin/sh

#Author: Chinmay Pohankar
#Date: Jan 29, 2023

if [ `whoami` != root ]; then
    echo "you are not a root user!"
    exit
else
    echo "you are a root user!"
fi
```

Output:

```
cgp@cgp-VirtualBox:~/CCL/Assignments/Assignment 2$ bash 2a.sh
you are not a root user!
cgp@cgp-VirtualBox:~/CCL/Assignments/Assignment 2$ sudo bash 2a.sh
[sudo] password for cgp:
you are a root user!
```

2b) Write a shell script to install any software (ex: java or python)

```
#!/bin/sh

# Author: Chinmay Pohankar
# Date : Jan 29, 2023

printf "Enter a package name: "
read packageName

if [ "$packageName --version" -ne 0 ]; then
    sudo apt-get update
    sudo apt-get install $packageName
else
    $packageName --version
    echo "Package already installed"
    exit
fi
```

Output:

```
cgp@cgp-VirtualBox:~/CCL/Assignments/Assignment 2$ bash 2b.sh
Enter a package name: python3
2b.sh: line 9: [: python3 --version: integer expression expected
Python 3.10.4
Package already installed
```

2c) Write a shell script to check disk usage of the system. This script should run every day at 8:00 AM.

```
# !/bin/sh
# Author : Chinmay Pohankar
# Date : Jan 29, 2023

df -Ph | grep -vE '/Filesystem|tmpfs|cdrom' | awk '{ print $5,$1 }' |

while read output;
do
echo $output
used=$(echo $output | awk '{print $1}' | sed s/%//g)
partition=$(echo $output | awk '{print $2}')
done

# 0 8 * * * sudo ./2c.sh > /dev/null 2>&1
```

Output:

```
cgp@cgp-VirtualBox:~$ bash 2c.sh
Use% Filesystem
80% /dev/sda3
2% /dev/sda2
```

2d) write a shell script to take mysql database server backup. This script should run weekly on every Sunday at 11:00 PM.

```
#!/bin/sh

# Author : Chinmay Pohankar
# Date : Jan 29, 2023

echo "starting database backup"
db_backup="mydb.gz"
sudo mysqldump -uroot -p mysql | gzip -c > ./${db_backup}
if [ "$?" -eq 0 ]; then
    echo "db backup complete"
else
    echo "db backup failed"
fi

# 0 23 * * 0 sudo ./2d.sh > /dev/null 2>&1
```

Output:

```
cgp@cgp-VirtualBox:~/CCL/Assignments/Assignment 2$ bash 2d.sh
starting database backup
[sudo] password for cgp:
Enter password:
db backup complete
```

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