**Lab Assignment 1**

Name: Vivek Sapkal | Roll No.: B22AI066

Q1. Write a program that creates a new text file with random texts every hour while running in background.

* Code:

#!/bin/bash

interval=3600

while true; do

random\_name=$(date +%s%N | md5sum | head -c 5)

touch "${random\_name}.txt"

head -c 100 /dev/urandom | tr -dc 'a-zA-Z0-9' > ${random\_name}.txt

sleep $interval

done &

* Description:
* The first line‘#!/bin/bash’ specifies that the script should be interpreted and executed using the Bash shell.
* The interval is set to 3600 seconds( 1 hour ) and ‘while true’ creates an infinite loop.
* The next line creates a random file name by combining the current timestamp in nanoseconds, calculating its MD5 checksum, and taking the first 5 characters.
* Touch command creates a new empty text file with the generated random name.
* The next line generates 100 bytes of random characters using ‘dev/urandom’ device and then ‘tr -dc 'a-zA-Z0-9’ command only keeps the alphanumeric characters and then they are written to our newly generated text file.
* sleep command pauses script execution for a specified interval( 1 hour).
* Last line ‘done &’ runs the loop in background allowing concurrent execution.

2. Change the file permissions and discuss each scenario for various permission levels.

* Types of file permissions are as follows:
* r (read): Allowed to read the file.
* w (write): Allowed to modify the file.
* x (execute): Allowed to execute the file (if it's a script or executable).

1. Read, Write and Execute for owner only:

Only the owner will be able to read, write or execute the file.

chmod u=rwx,g=,o= filename

1. Read and Execute for owner and Read only for group:

The user will be able to read and execute and the group will be able to read the file.

chmod u=rx,g=r,o= filename

1. Read and Write owner and group and read only for others:

Owner and group will be able to read and write the file and others can only read the file.

chmod u=rw,g=rw,o=r filename

1. Read and Execute for everyone and write for owner only:

Everyone will be able to read and execute the file but only the owner can write to the file.

chmod a=rx,u+w filename

Similarly there can be many more scenarios with different permissions for owner, group and others.

3. Write a program to automatically restart a background process if the process is stopped.

* Code:

#!/bin/bash

while true; do

if ! pgrep -x "myscript.sh" > /dev/null; then

./myscript.sh &

fi

sleep 60

done &

* Description:
* The first line‘#!/bin/bash’ specifies that the script should be interpreted and executed using the Bash shell.
* In the next line ’while true’ creates an infinite loop.
* The next line checks whether a process named ‘myscript.sh’ is running. Here ‘pgrep’ searches for the process name, ‘-x’ ensures exact match and ‘> /dev/null’ redirects the output to null to suppress it.
* If the process is not running then it is restarted in the background by command ‘myscript.sh &’.
* sleep command pauses script execution for a specified interval( 60 seconds).
* Last line ‘done &’ runs the loop in background allowing concurrent execution.