Lab Assignment 1

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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`

2) 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`

3) 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`

4) 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.