Linux assignment –8

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1. **What is a user-defined function in shell scripting? Explain with an example.**

Ans: usser defined function is the block of code written by the user to perform the scripttask. Isted of writting the same code repeatedtly we use the user defind fuction in the shell scripting language.

Example:
```
#!/bin/bash
  greet() {
echo "Hello, Welcome "
  }
greet
```

Here the user defind a function called greet which print the specific words. When user want to this process repeatedly he will call the fuction how much time he want.

2. **Write a bash script with a function that multiplies two integer numbers.**

Ans:
```
#!/bin/bash
 multiply() {
 result=$(( $1 * $2 ))
echo "The product is: $result }
 echo "Enter first number:"
 read a
echo "Enter second number:"
read b
multiply $a $b
```

3. **Explain how arrays (1D, 2D, and 3D) are declared in bash scripting**

Ans: in the bash programming the the array is used to store the multi values through insertionsion in a single variable which may use 1d 2d 3d array can be simulate using the required loop

1d array

```
Arr =(10 ,20 ,30, 40)

${arr[ 1]}
```

2d array

```
arr[0,0]=1

arr[0,1]=2

arr[1,0]=3

arr[1,1]=4

echo ${arr[1,1]}
```

3D Array

You can use multindex variables likes arr[x,y,z]=value, but they are treated as stringkeys, not true 3D arrays.

4. **Write a shell script to display elements of an array.**

Ans;

```
#!/bin/bash

Arr =(apple ,banana ,mango ,orange)

echo "array elements are :"

for item in "${arr[@]}"

do

echo $item

Done
```

Here the array store the name of the. Fruires by using the loop statement we can inserted and printed the array.

5. **What is the purpose of cron in Linux?**

Ans:

The corn service in klinux is used tio schedule task to run the automatically at secific time line or intervals it will helpfull for the automating repetivative job like backups and cleanups

The tasks are defineded inside a **cron tab file**which will tells the system that in which it what we have to do . Cron make system management easir by running thing autoomatically without any user interaction.

6. **Write a cron job to run a backup script every day at midnight.**

Ans:

To run the bckup job at erey night we add the below line in the controll corn tab.

(0 0 * * * /home/user/backup.sh.).

Here

0 0 minute and hour

* * * every day, every month, every year

/home/user/backup.sh path to the bash script to execute

This ewill backup script runs automatically at 12.00 am every day.

7. **How do you schedule a one-time job using at command?**

Ans: the “at” is specially used to shedukle the time to execute the specific command within the time intervals and it will happens only once.

Example: at 10:00pm

Here the after. Entering the enter after the enter what commad we will write it will happen in the given time intervals

at 1.00pm

sh /home/user/cleanup.sh

After this we have to save the command by clicking thee ctrl+d

8. **Write a script to display disk usage using df and du.**

Ans:

```
#!/bin/bash
echo "disk space usage "
 df -h
```

```
  echo ""
  echo "directory usage "
  du -h --max-depth=1
```

Here

df -h it will shows thetotal disk space and free uped space in readable formate.

du -h --max-depth=1 it will shows the size of each folder in current directorys

9. . How can you log the output of a script using the tee command?

Ans: tee command is used to see the output and also save it in a specific files or other things at the same time intervasl.

```
#!/bin/bash
  echo "system information " | tee systemlog.txt
  date | tee -a systemlog.txt
  df -h | tee -a systemlog.txt
```

The -a option append the output insted of over wirting the file .

10. Explain with an example how shell scripting can automate system administration tasks.

Ans: Shell scripting is used to makew system administration tasks which are usually repetiative and time-consuming.

For exampl , admin write a script that automatically backs up files,and clears old logs, updates packages, or monitors disk space.

#!/bin/bash

```
backup_dir="/backup"
src_dir="/home/user"
cp -r $src_dir $backup_dir
echo "backup completed successfully on $(date)"
```