Linux Programming: Assignment-8

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

Answer: A function is a block of reusable code defined by the user.

Example**:**

```
my_function () {
  echo "This is a function"
}
my_function
```

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

Answer:

```
multiply () {
  result=$(($1 * $2))
  echo "Product: $result"
}
multiply 5 10
```

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

Answer:

```
# 1D array
arr= (10 20 30)

# 2D array (using nested arrays or indexing)
arr2D [0,0] =1
arr2D [0,1] =2

# 3D array (simulated using associative arrays)
declare -A arr3D
arr3D [0,0,0] =5
```

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

Answer:

```
arr= (10 20 30 40)
for I in "${arr [@]}"
do
  echo $i
done
```

5. What is the purpose of cron in Linux?

Answer:

Cron is a job scheduler used to execute commands or scripts automatically at specified intervals.

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

Answer:

```
0 0 * * * /home/user/backup.sh
```

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

Answer:

```
at 10:00 PM
bash /home/user/task.sh
Ctrl + D
```

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

Answer:

```
echo "Disk Free Space:"
df -h
echo "Disk Usage by Directory:"
du -sh *
```

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

Answer:

```
echo "Logging system status..." | tee log.txt
df -h | tee -a log.txt
```

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

Answer:

Shell scripts can automate repetitive admin tasks such as backups, monitoring, and cleanup.

Example:

tar -czf backup_$(date +%F). tar.gz /home/user/data

echo "Backup completed successfully!"

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