Linux Assignment 8: Functions, Arrays, and Automation

1. What is a user-defined function in shell scripting? Explain with an example. (CO4)

A user-defined function in shell scripting is a block of code that performs a specific task and that can be reused multiple times in the script.

Example:

```
#!/bin/bash
greet(){
   echo "Hello, $1!"
}

greet Priyanshu
```

Terminal Output (Revised):

```
Aarit@Aarit:~$ gedit greet.sh
Aarit@Aarit:~$ chmod +x greet.sh
Aarit@Aarit:~$ ./greet.sh
Hello, Priyanshu!
Aarit@Aarit:~$
```

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2. Write a bash script with a function that multiplies two integer numbers. (CO4)

```
#!/bin/bash
multiply(){
   result=$(($1 * $2))
   echo "The product is: $result"
```

}

multiply 5 7

Terminal Output (Revised):

Aarit@Aarit:~$ gedit multiply.sh

Aarit@Aarit:~$ chmod +x multiply.sh

Aarit@Aarit:~$ ./multiply.sh

The product is: 35

Aarit@Aarit:~$

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3. Explain how arrays (1D, 2D, and 3D) are declared in bash scripting. (CO4)

* **1D Array:**

  ```bash
  fruits=("apple" "banana" "cherry")
  ```

* **2D Array:**

  ```bash
  matrix[0,0]=1
  matrix[0,1]=2
  matrix[1,0]=3
  matrix[1,1]=4
  ```

* **3D Array:**

  ```bash
  cube[0,0,0]=10
  ```

```
cube[0,0,1]=20
cube[0,1,0]=30
```

---

4. Write a shell script to display elements of an array. (CO4)

```
#!/bin/bash

fruits=("apple" "banana" "cherry" "mango")
echo "The elements of the array are:"

for item in "${fruits[@]}"
do
  echo "$item"
done
```

Terminal Output (Revised):

```
Aarit@Aarit:~$ gedit display.sh
Aarit@Aarit:~$ chmod +x display.sh
Aarit@Aarit:~$ ./display.sh
The elements of the array are:
apple
banana
cherry
mango
Aarit@Aarit:~$
```

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5. What is the purpose of cron in Linux? (CO4)

The purpose of cron in Linux is to automate tasks by scheduling commands or scripts to run at specific time or intervals. It helps run tasks automatically like backups, updates or sending reports without doing them manually.

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6. Write a cron job to run a backup script every day at midnight. (CO4)

A cron job to run a backup script every day at midnight is: