Assignment : 7
Linux Programming

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1. **What is a bash shell script? Give one example**
   It's a plain text file containing a sequence of commands for the **Bash interpreter** to execute, used to automate tasks in a Unix-like environment.
   - **Example:**
   ```
   #!/bin/bash
   echo "Disk space: $(df -h /)"
   ```

2. **Write a simple shell script to print "Hello World".**
   ```
   #!/bin/bash echo
   "Hello World"
   ```

3. **What is the purpose of comments (#) in a shell script?**
   The hash symbol (#) marks text that should be **ignored** by the shell. It's used for documentation, increasing readability, and temporarily disabling code lines.
   Example:
   ```
   #!/bin/bash
   # Check if the log directory exists before running cleanup.
   If [ -d "$LOG_DIR" ]; then
    # Remove files older than 30 days to free up disk space.
    Find "$LOG_DIR" -type f -mtime +30 -delete
   Fi
   ```

4. **How do you declare variables (int, float, double, string, Boolean, and char**
   In a shell script?
   Bash variables are **untyped** (treated as strings). You declare them by simple assignment.
   - **String/Char:** NAME="Alice"
   - **Boolean :** Variables that represent true/false values (using strings)
   - **Integer:** COUNT=10 (Math is done using arithmetic expansion: SUM=$((A + B)))
   - **Float/Double:** Not natively supported; requires external tools like **bc**

5. **Write a shell script to display the current date and time.**
   ```
   #!/bin/bash
   echo "Current Time: $(date)"
   ```

6. **Explain the difference between a constant and a variable.**

Variable (Mutable)

- **Definition:** A named storage location whose value **can be changed** (reassigned) during the script's execution.
- **Declaration:** Simple assignment. `MY_VAR="initial value"`

```
# Later in the script, you can change it:
MY_VAR="new value"
```

- **Use:** Storing dynamic data like counters, user input, temporary calculation results, or loop indices.

Constant (Read-only Variable)

- **Definition:** A named storage location whose value, once set, **cannot be changed** (reassigned or unset) during the script's execution.
- **Declaration:** Use the built-in **readonly** command (or declare -r). `readonly CONFIG_PATH="/etc/app/config.conf"`
```
# Attempting to change this will result in an error:
# CONFIG_PATH="/tmp/new_path"
# Bash will output: 'CONFIG_PATH: readonly variable'
```
- **Use:** Storing fixed configuration settings, file paths, application names, version numbers, or mathematical values that must remain consistent throughout the script's lifespan.

7. **Write a shell script to read two integer number from the user and compute the Sum of both the number**

..
```
#!/bin/bash
echo "Enter two
numbers:" read num1 num2
sum=$((num1 + num2)) echo
"Sum: $sum"
```

8. **What is the use of the source command shell scripting?**
   The source (or .) command **executes a script in the *current* shell**, not a subshell. This is primarily used to load configuration files or functions so they permanently affect the current environment (like your terminal session).

9. **How can you debug a shell script? (Give two methods)**
   - **Tracing (-x):** Run the script with bash -x ./script.sh or use set -x inside the script. This prints every command before execution.
   - **Syntax Check (-n):** Run with bash -n ./script.sh. This checks the script for syntax errors without actually running any commands.

10. **Write a bash script to create and delete a file.**
```
#!/bin/bash
FILE="temp_file.dat"
# Create the file
touch "$FILE" echo
"Created $FILE"
# Delete the file rm
-f "$FILE" echo
"Deleted $FILE"
```