🐚 Linux (UNIX) Shell Scripting for Automation

Learn how to automate tasks using shell scripts
with practical syntax and examples.

✅ What is Shell Scripting?

- A shell script is a text file with a sequence of shell commands
- Common shells: `bash`, `sh`, `zsh`
- Used for **automation**, system tasks, backups, batch jobs

🛠️ Writing a Script

1. Create a file: `script.sh`
2. Add shebang: `#!/bin/bash`
3. Make it executable: `chmod +x script.sh`
4. Run: `./script.sh`

Or, you can skip the step 2 and 3:

1. Run: `bash ./script.sh`

🧮 Variables

```
name="Alice"
echo "Hello, $name"
```

- No space around `=`
- Use `$` to access

🔁 Conditionals

```
if [ "$a" -eq 5 ]; then
  echo "a is 5"
elif [ "$a" -gt 5 ]; then
  echo "a is greater than 5"
else
  echo "a is less than 5"
fi
```

🔂 Loops

For Loop

```
for i in 1 2 3; do
  echo "Number $i"
done
```

While Loop

```
count=1
while [ $count -le 5 ]; do
  echo $count
  ((count++))
done
```

🔧 Functions

```
greet() {
  echo "Hello, $1"
}

greet "Bob"
```

- `$1`, `$2`, … are positional parameters

📁 File and Directory

```
mkdir myfolder
cd myfolder
touch file.txt
rm file.txt
```

📤 Redirects and Pipes

```
echo "Log entry" >> log.txt
cat file.txt | grep "error"
```

- `>` overwrite, `>>` append
- `|` passes output to next command

🧪 Automation Example: Backup

```
#!/bin/bash
src="/home/user/docs"
dest="/backup/docs_$(date +%F).tar.gz"
tar -czf $dest $src
echo "Backup saved to $dest"
```

⏰ Cron Jobs

Run scripts at scheduled times

```
crontab -e
```

Example: run daily at 2 AM

```
0 2 * * * /path/to/script.sh
```

📚 Useful Built-ins

- `$#` – number of arguments
- `$@` – all arguments
- `$$` – PID of script
- `$?` – exit code of last command

Best Practices

- Quote variables: `"$var"`
- Use `set -e` to stop on errors
- Use logging
- Use meaningful variable names
- Test before automating

🎯 Summary

- Shell scripting is great for automating Unix tasks
- Learn variables, loops, conditionals, and functions
- Use cron for scheduled automation

🚀 You're Ready

Automate with shell scripting!