Assignment 1 — Log Analytics & Backup Automation

Build a Bash automation pipeline to process, summarize, and archive server logs. You'll generate analytics (CSV and TXT reports), rotate/compress logs, verify integrity, and schedule tasks. Focus on modular scripts, clear CLI flags, and robust error handling. No sudo required.

Prerequisites

1. Familiarity with basic Linux shell commands and Bash scripting.
2. Tools needed: grep, awk, sed, sort, uniq, cut, tar, gzip, sha256sum, date.
3. cron or systemd user timers must be available.
4. Writable home directory; no admin privileges required.

Setup

Create folders and sample logs:

```
mkdir -p ~/loglab/raw ~/loglab/archive ~/loglab/reports
cat > ~/loglab/raw/access.log <<'EOF'
192.168.1.10 - - [28/Oct/2025:10:01:12 +0530] "GET /index.html 200" 512
10.0.0.5 - - [28/Oct/2025:10:01:15 +0530] "POST /login 302" 128
EOF
```

Make scripts executable:

```
touch ~/loglab/log_report.sh ~/loglab/verify_archive.sh ~/loglab/run_daily.sh
chmod +x ~/loglab/*.sh
```

Assignment Tasks

1. Write log_report.sh to parse logs, extract analytics, and save reports.
2. Rotate, compress, and checksum archives automatically.
3. Implement verify_archive.sh to validate checksums.
4. Schedule execution with cron or systemd.
5. Retain last 7 archives only.

Marks Distribution

1. Parsing & reports: 30
2. Rotation & compression: 20
3. Checksum verification: 15
4. Scheduling automation: 15
5. Code clarity & robustness: 15
6. README: 5

Stretch Goals (20 Marks)

1. Add daily trend comparison.
2. Generate JSON output.

3 Optional email reporting.