Inside iot_logger, create logs/temperature.log and scripts/sensor_script.py.

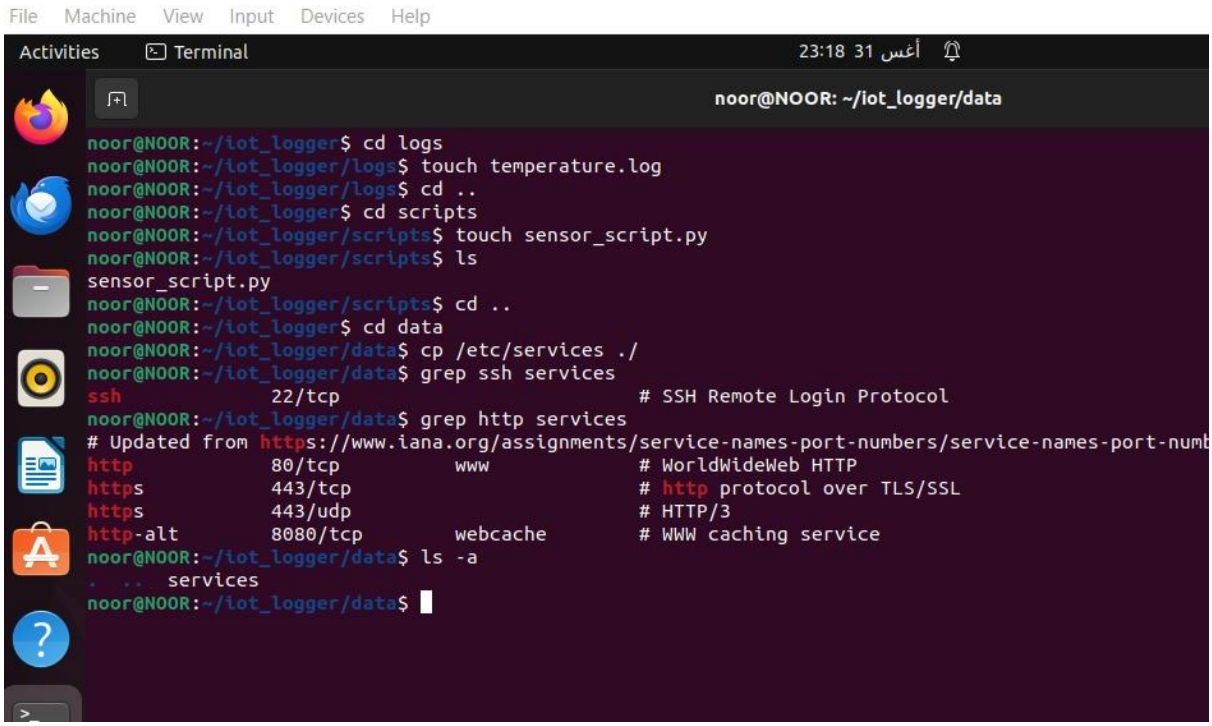
Copy /etc/services into data and search for patterns like ssh or http.

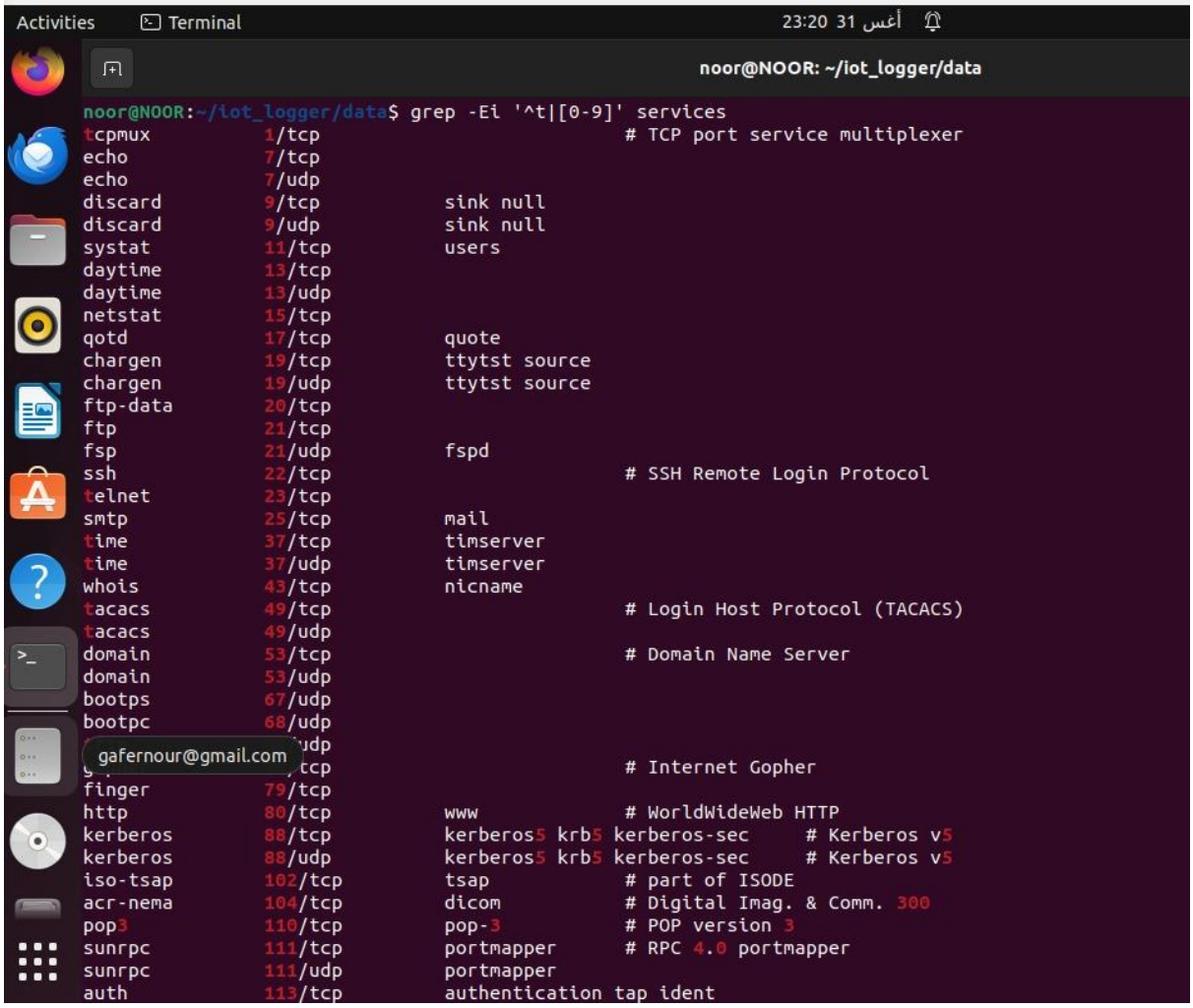
Use regex to find lines starting with t or containing numbers.

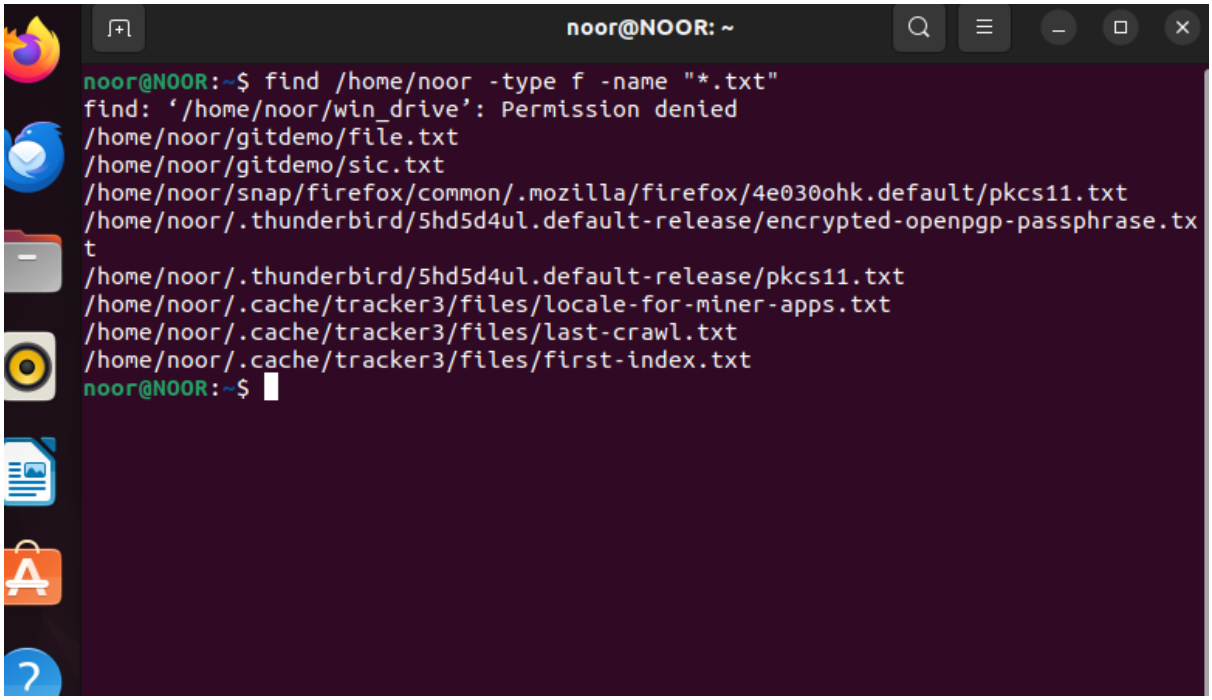
Locate .txt files in /home/<username> and remove temporary ones if needed.

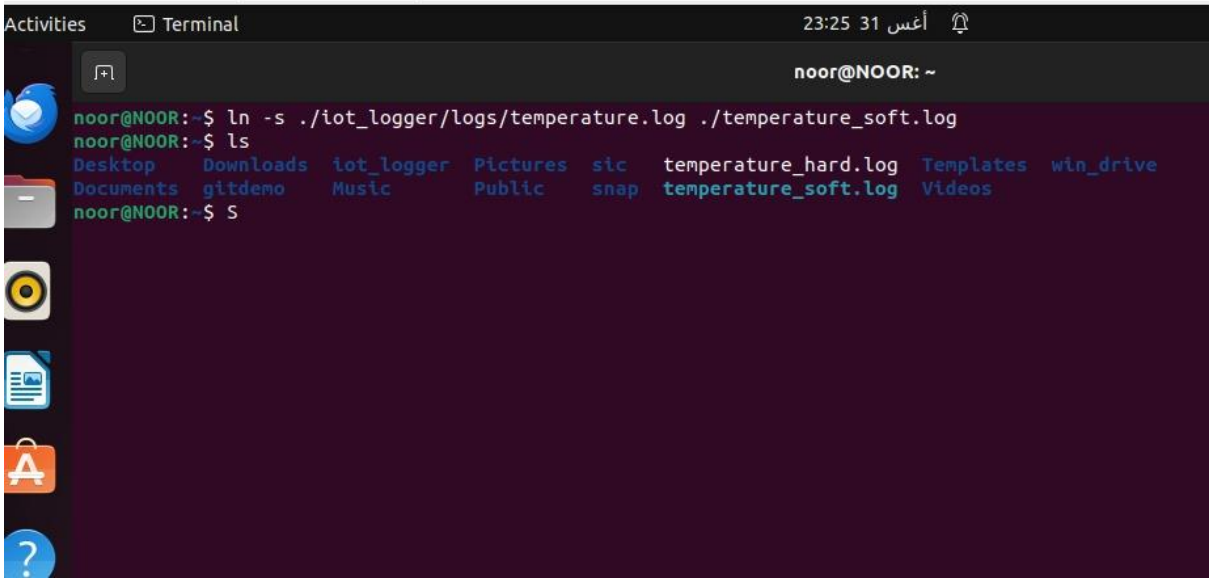
Create hard and symbolic links for temperature.log.

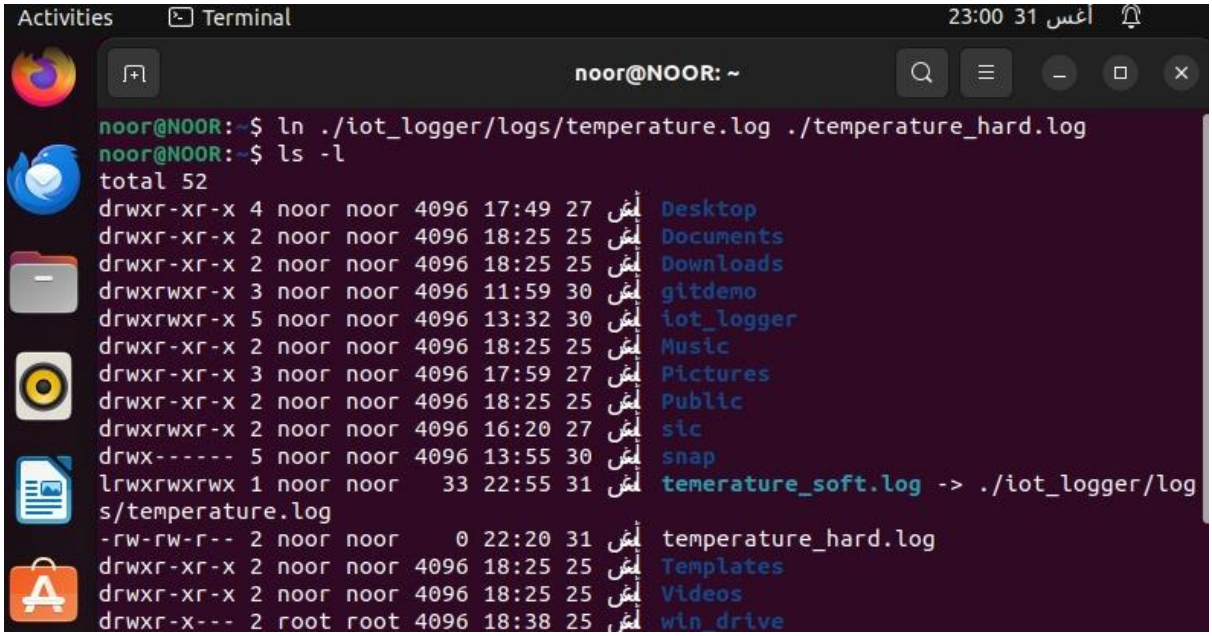
Display directory structure to confirm organization

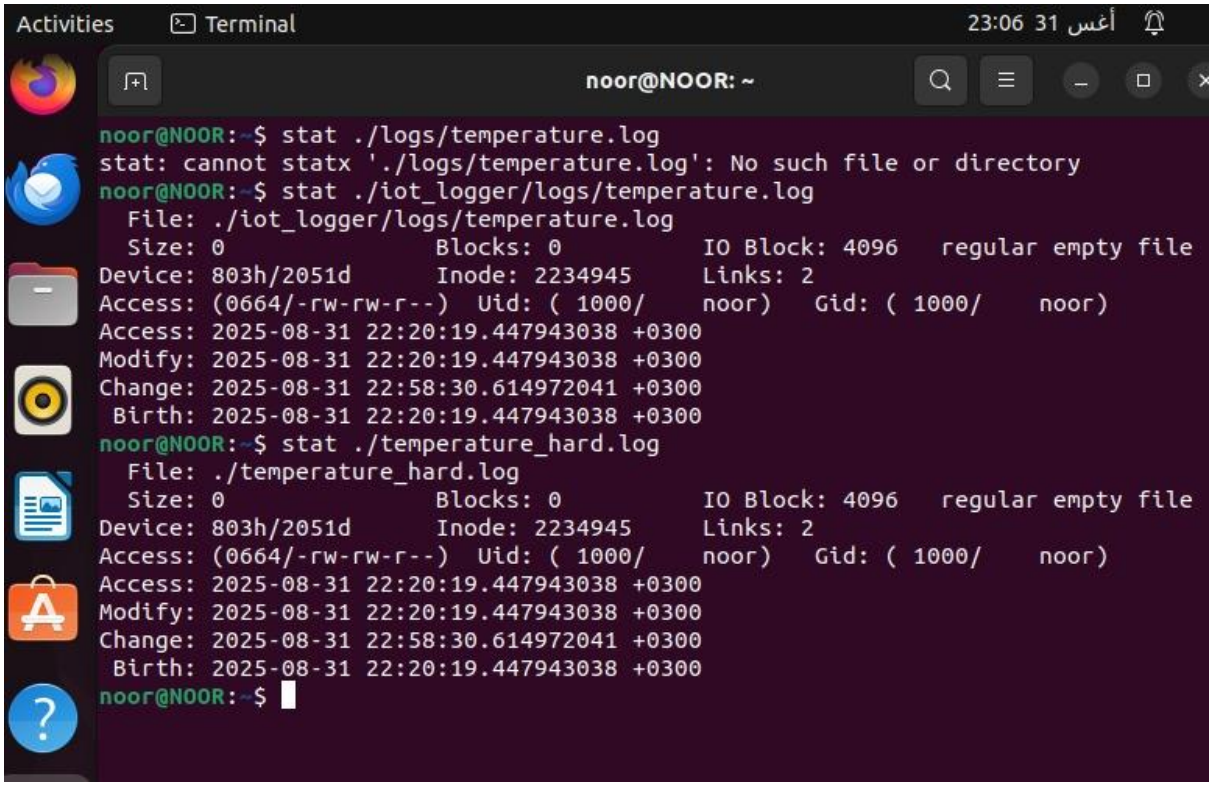


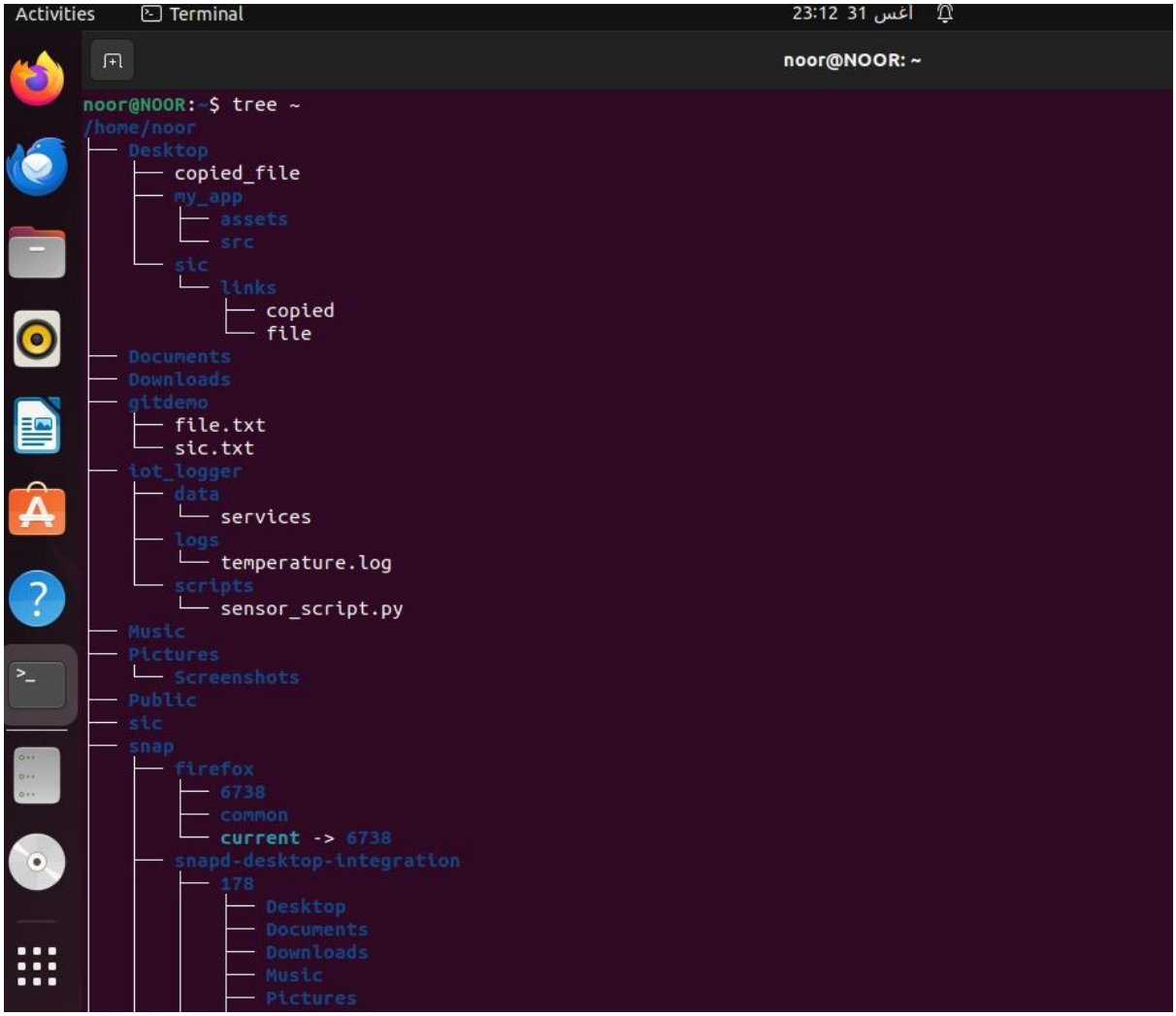

Activities
Terminal
23:20 31 أغس
noor@NOOR: ~/iot_logger/data
noor@NOOR:~/iot_logger/data$ grep -Ei '^t|[0-9]' services
tcpmux 1/tcp # TCP port service multiplexer
echo 7/tcp
echo 7/udp
discard 9/tcp sink null
discard 9/udp sink null
systat 11/tcp users
daytime 13/tcp
daytime 13/udp
netstat 15/tcp
qotd 17/tcp quote
chargen 19/tcp ttytst source
chargen 19/udp ttytst source
ftp-data 20/tcp
ftp 21/tcp
fsp 21/udp fspd
ssh 22/tcp # SSH Remote Login Protocol
telnet 23/tcp
smtp 25/tcp mail
time 37/tcp timserver
time 37/udp timserver
whois 43/tcp nicname
tacacs 49/tcp # Login Host Protocol (TACACS)
tacacs 49/udp
domain 53/tcp # Domain Name Server
domain 53/udp
bootps 67/udp
bootpc 68/udp
gafernour@gmail.com
finger 79/tcp
http 80/tcp www # WorldWideWeb HTTP
kerberos 88/tcp kerberos5 krb5 kerberos-sec # Kerberos v5
kerberos 88/udp kerberos5 krb5 kerberos-sec # Kerberos v5
iso-tsap 102/tcp tsap # part of ISODE
acr-nema 104/tcp dicom # Digital Imag. & Comm. 300
pop3 110/tcp pop-3 # POP version 3
sunrpc 111/tcp portmapper # RPC 4.0 portmapper
sunrpc 111/udp portmapper
auth 113/tcp authentication tap ident

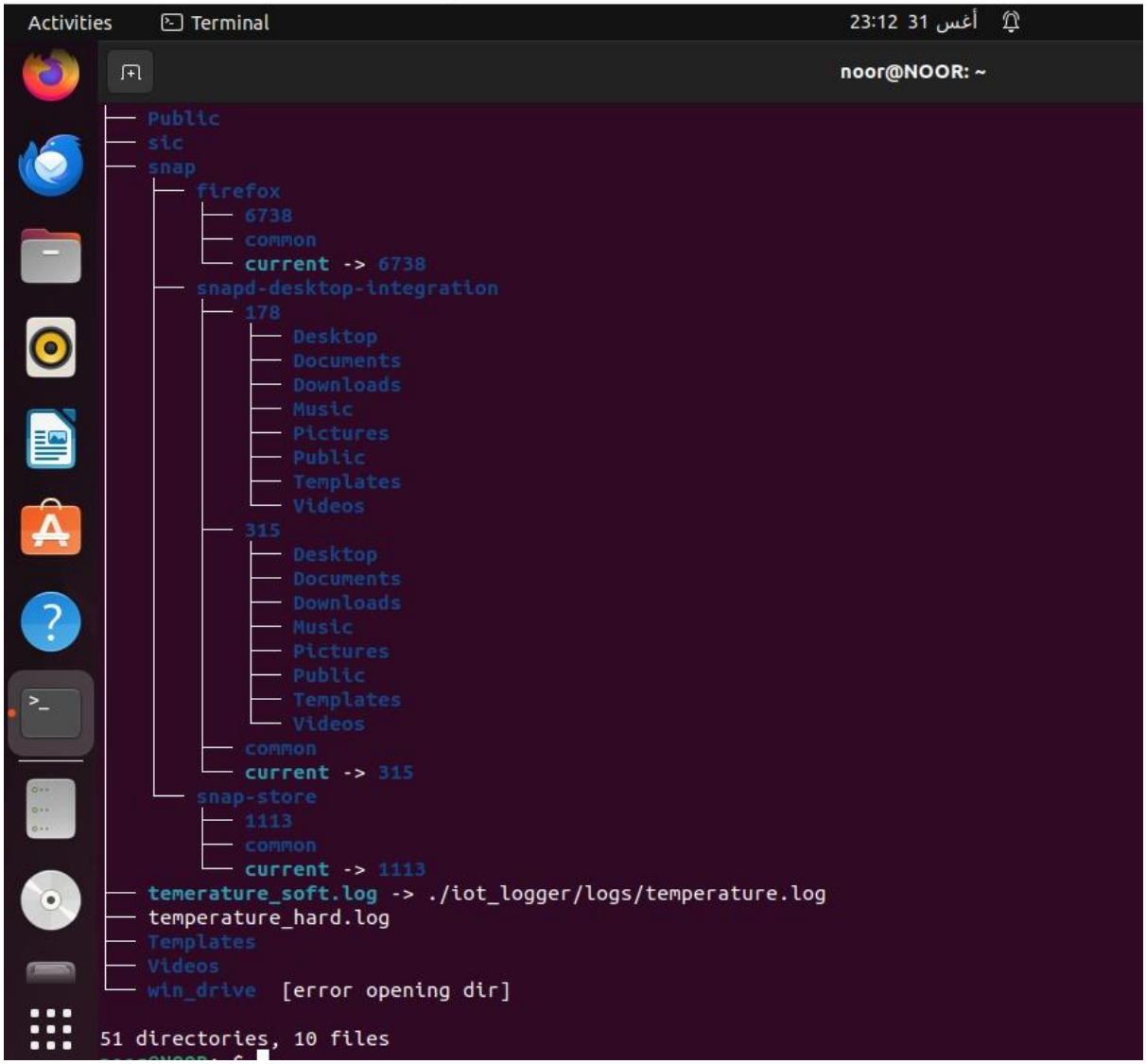

noor@NOOR: ~
noor@NOOR:~$ find /home/noor -type f -name "*.txt"
find: ‘/home/noor/win_drive’: Permission denied
/home/noor/gitdemo/file.txt
/home/noor/gitdemo/sic.txt
/home/noor/snap/firefox/common/.mozilla/firefox/4e030ohk.default/pkcs11.txt
/home/noor/.thunderbird/5hd5d4ul.default-release/encrypted-openpgp-passphrase.tx
t
/home/noor/.thunderbird/5hd5d4ul.default-release/pkcs11.txt
/home/noor/.cache/tracker3/files/locale-for-miner-apps.txt
/home/noor/.cache/tracker3/files/last-crawl.txt
/home/noor/.cache/tracker3/files/first-index.txt
noor@NOOR:~$


Activities
Terminal
23:25 31 أغس
noor@NOOR: ~
noor@NOOR:~$ ln -s ./iot_logger/logs/temperature.log ./temperature_soft.log
noor@NOOR:~$ ls
Desktop Downloads iot_logger Pictures sic temperature_hard.log Templates win_drive
Documents gitdemo Music Public snap temperature_soft.log Videos
noor@NOOR:~$ s


Activities
Terminal
23:00 31 أغس
noor@NOOR: ~
noor@NOOR:~$ ln ./iot_logger/logs/temperature.log ./temperature_hard.log
noor@NOOR:~$ ls -l
total 52
drwxr-xr-x 4 noor noor 4096 17:49 27 أغس Desktop
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Documents
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Downloads
drwxrwxr-x 3 noor noor 4096 11:59 30 أغس gitdemo
drwxrwxr-x 5 noor noor 4096 13:32 30 أغس iot_logger
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Music
drwxr-xr-x 3 noor noor 4096 17:59 27 أغس Pictures
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Public
drwxrwxr-x 2 noor noor 4096 16:20 27 أغس sic
drwx------ 5 noor noor 4096 13:55 30 أغس snap
lrwxrwxrwx 1 noor noor 33 22:55 31 أغس temerature_soft.log -> ./iot_logger/log
s/temperature.log
-rw-rw-r-- 2 noor noor 0 22:20 31 أغس temperature_hard.log
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Templates
drwxr-xr-x 2 noor noor 4096 18:25 25 أغس Videos
drwxr-x--- 2 root root 4096 18:38 25 أغس win_drive


Activities
Terminal
23:06 31 أغس
noor@NOOR: ~
noor@NOOR:~$ stat ./logs/temperature.log
stat: cannot statx './logs/temperature.log': No such file or directory
noor@NOOR:~$ stat ./iot_logger/logs/temperature.log
File: ./iot_logger/logs/temperature.log
Size: 0 Blocks: 0 IO Block: 4096 regular empty file
Device: 803h/2051d Inode: 2234945 Links: 2
Access: (0664/-rw-rw-r--) Uid: (1000/ noor) Gid: (1000/ noor)
Access: 2025-08-31 22:20:19.447943038 +0300
Modify: 2025-08-31 22:20:19.447943038 +0300
Change: 2025-08-31 22:58:30.614972041 +0300
Birth: 2025-08-31 22:20:19.447943038 +0300
noor@NOOR:~$ stat ./temperature_hard.log
File: ./temperature_hard.log
Size: 0 Blocks: 0 IO Block: 4096 regular empty file
Device: 803h/2051d Inode: 2234945 Links: 2
Access: (0664/-rw-rw-r--) Uid: (1000/ noor) Gid: (1000/ noor)
Access: 2025-08-31 22:20:19.447943038 +0300
Modify: 2025-08-31 22:20:19.447943038 +0300
Change: 2025-08-31 22:58:30.614972041 +0300
Birth: 2025-08-31 22:20:19.447943038 +0300
noor@NOOR:~$


Activities
Terminal
23:12 31 اغس
noor@NOOR: ~
noor@NOOR:~$ tree ~
/home/noor
├── Desktop
│   ├── copied_file
│   ├── my_app
│   │   ├── assets
│   │   └── src
│   └── sic
│   └── links
│   ├── copied
│   └── file
├── Documents
├── Downloads
├── gitdemo
│   ├── file.txt
│   └── sic.txt
├── iot_logger
│   ├── data
│   │   └── services
│   ├── logs
│   │   └── temperature.log
│   └── scripts
│   └── sensor_script.py
├── Music
├── Pictures
│   └── Screenshots
├── Public
├── sic
├── snap
│   ├── firefox
│   │   ├── 6738
│   │   ├── common
│   │   └── current -> 6738
│   ├── snapd-desktop-integration
│   │   ├── 178
│   │   │   ├── Desktop
│   │   │   ├── Documents
│   │   │   ├── Downloads
│   │   │   ├── Music
│   │   │   ├── Pictures



Explain the different types of files in Linux (regular, directory, symbolic link, device, etc.) and how to check them with commands.

Linux treats everything as a file but there is different types

Regular file (-) : store data such as text images and they have extensions like .txt .jpg but the extensions are not mandatory in Linux ex: touch newfile.txt

Directory file (d) : special files that store other files and help organize files and all directories are created under the / root directory ex: mkdir newdirectory

Symbolic link (l): create a pointer to the original file and can link to directories or files on different filesystems ex: ln -s originalfile softlink

Special files: block or character special files represent device files such as hard drive and keyboards

How to check them with commands : ls -l shows type of the file like (- , d , l ,b)

Or by file filename shows the type like text file , ELF executable

What is the difference between a hard link and a symbolic link? Give real examples of when to use each

Hard link : directly point to the inode of he file as the original file and deleting the original file doesn't affect the hard link

Symbolic link (soft link) : is like a shortcut for the original file and it points to the original file so if the original file is deleted the symbolic link becomes broken

Use hard link when you need to make backup version for the file with the same content

Use symbolic link when you want to make a shortcut

Is rmdir the same as rm -r when deleting directories? Explain.

rmdir : removes empty directories only

rm -r : recursively removes the directory and all its content