



National Textile University

Department of Computer Science

Subject:

Operating Systems

Submitted To:

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23-NTU-CS-1135

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Week 1- Home tasks

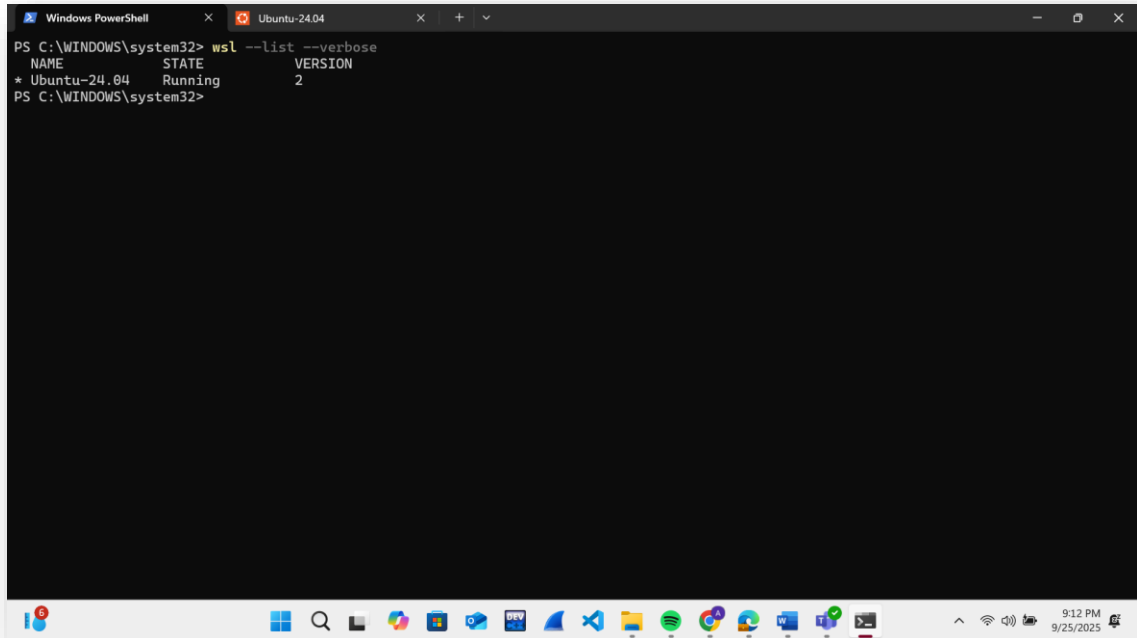
Semester:

5th

Week 1 Home tasks:

Part A: WSL2 & Ubuntu Setup

1. Verify WSL2 and Ubuntu installation



A screenshot of a Windows PowerShell terminal window. The title bar shows two tabs: 'Windows PowerShell' and 'Ubuntu-24.04'. The terminal content shows the command `wsl --list --verbose` being executed, which returns a table of installed WSL instances. The table has three columns: NAME, STATE, and VERSION. One instance is listed: 'Ubuntu-24.04' with a state of 'Running' and a version of '2'. The prompt is `PS C:\WINDOWS\system32>`. The Windows taskbar is visible at the bottom with various application icons and a system clock showing 9:12 PM on 9/25/2025.

```
PS C:\WINDOWS\system32> wsl --list --verbose
NAME                STATE              VERSION
* Ubuntu-24.04      Running            2
PS C:\WINDOWS\system32>
```

2. Update Ubuntu Environment

```
alishba@DESKTOP-S3K0VAS: $ sudo apt update && sudo apt upgrade -y
[sudo] password for alishba:
Sorry, try again.
[sudo] password for alishba:
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
17 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
The following packages will be upgraded:
  dpkg dpkg-dev landscape-client landscape-common libc-bin libc-dev-bin libc-devtools libc6 libc6-dev libdpkg-perl
  libpam-modules libpam-modules-bin libpam-runtime libpam0g linux-libc-dev locales systemd-hwe-hwdb
17 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
14 standard LTS security updates
Need to get 221 kB/15.6 MB of archives.
After this operation, 17.4 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 systemd-hwe-hwdb all 255.1.5 [3518 B]
Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-client amd64 24.02-0ubuntu5.6 [124 kB]
Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-common amd64 24.02-0ubuntu5.6 [93.2 kB]
Fetched 221 kB in 7s (31.5 kB/s)
Preconfiguring packages ...
(Reading database ... 46649 files and directories currently installed.)
```

```
(Reading database ... 46649 files and directories currently installed.)
Preparing to unpack .../libpam-runtime_1.5.3-5ubuntu5.5_all.deb ...
Unpacking libpam-runtime (1.5.3-5ubuntu5.5) over (1.5.3-5ubuntu5.4) ...
Setting up libpam-runtime (1.5.3-5ubuntu5.5) ...
(Reading database ... 46649 files and directories currently installed.)
Preparing to unpack .../0-locales_2.39-0ubuntu8.6_all.deb ...
Unpacking locales (2.39-0ubuntu8.6) over (2.39-0ubuntu8.5) ...
Preparing to unpack .../1-systemd-hwe-hwdb_255.1.5_all.deb ...
Unpacking systemd-hwe-hwdb (255.1.5) over (255.1.4) ...
Preparing to unpack .../2-dpkg-dev_1.22.6ubuntu6.5_all.deb ...
Unpacking dpkg-dev (1.22.6ubuntu6.5) over (1.22.6ubuntu6.2) ...
Preparing to unpack .../3-libdpkg-perl_1.22.6ubuntu6.5_all.deb ...
Unpacking libdpkg-perl (1.22.6ubuntu6.5) over (1.22.6ubuntu6.2) ...
Preparing to unpack .../4-landscape-client_24.02-0ubuntu5.6_amd64.deb ...
Unpacking landscape-client (24.02-0ubuntu5.6) over (24.02-0ubuntu5.3) ...
Preparing to unpack .../5-landscape-common_24.02-0ubuntu5.6_amd64.deb ...
Unpacking landscape-common (24.02-0ubuntu5.6) over (24.02-0ubuntu5.3) ...
Setting up linux-libc-dev:amd64 (6.8.0-84.84) ...
Setting up locales (2.39-0ubuntu8.6) ...
Generating locales (this might take a while)...
Generation complete.
Setting up landscape-common (24.02-0ubuntu5.6) ...
Setting up landscape-client (24.02-0ubuntu5.6) ...
Setting up libdpkg-perl (1.22.6ubuntu6.5) ...
Setting up systemd-hwe-hwdb (255.1.5) ...
Setting up libc-dev-bin (2.39-0ubuntu8.6) ...
Setting up libc-devtools (2.39-0ubuntu8.6) ...
Setting up dpkg-dev (1.22.6ubuntu6.5) ...
Setting up libc6-dev:amd64 (2.39-0ubuntu8.6) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for udev (255.4-1ubuntu8.10) ...
Processing triggers for libc-bin (2.39-0ubuntu8.6) ...
```

Part B: Git & Github SSH Setup

1. Configure Git

```
alishba@DESKTOP-S3K0VA5: ~$ git config --help

--bool            value is "true" or "false"
--int             value is decimal number
--bool-or-int     value is --bool or --int
--bool-or-str     value is --bool or string
--path            value is a path (file or directory name)
--expiry-date     value is an expiry date

Other
-z, --[no-]null    terminate values with NUL byte
--[no-]name-only  show variable names only
--[no-]includes   respect include directives on lookup
--[no-]show-origin show origin of config (file, standard input, blob, command line)
--[no-]show-scope show scope of config (worktree, local, global, system, command)
--[no-]default <value>
                    with --get, use default value when missing entry

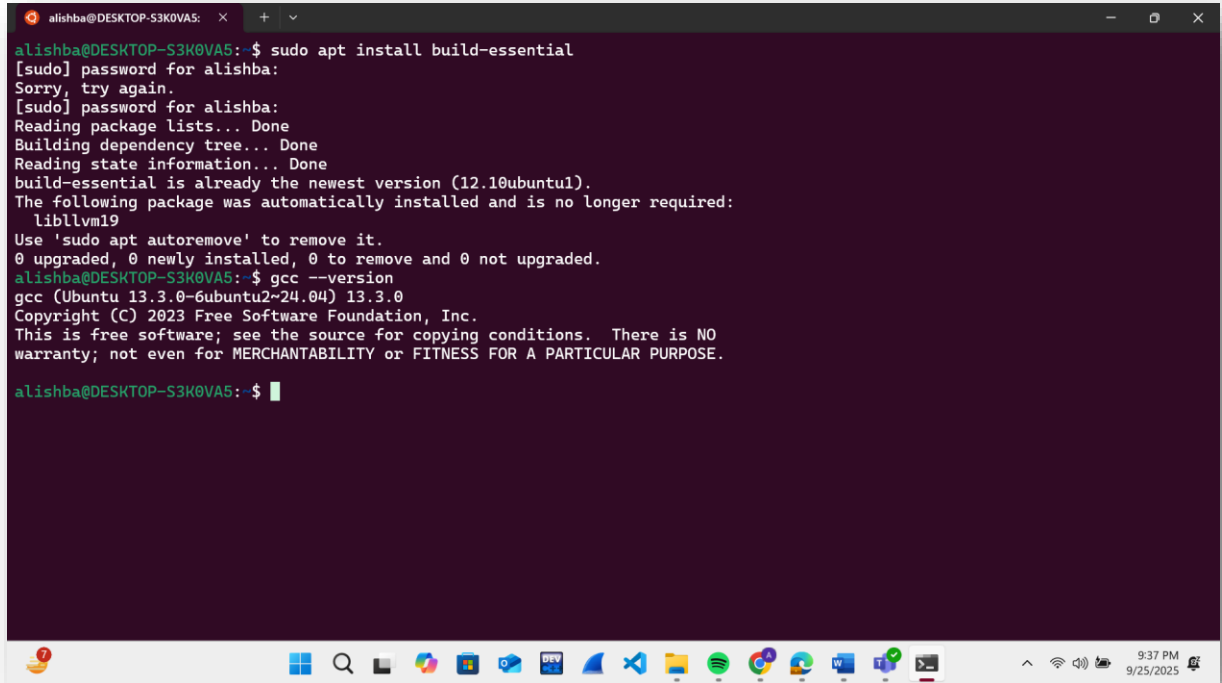
alishba@DESKTOP-S3K0VA5:~$ git config --global user.email alishbariasat123@gmail.com
alishba@DESKTOP-S3K0VA5:~$ git config --list
user.name=Alishba Alvi
user.email=alishbariasat123@gmail.com
alishba@DESKTOP-S3K0VA5:~$ ssh-keygen -t ed25519
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/alishba/.ssh/id_ed25519):
Created directory '/home/alishba/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/alishba/.ssh/id_ed25519
Your public key has been saved in /home/alishba/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:r0Lt30eGL1tPHXn8XLYzqxyL5pPTrEoWqV7lID1qzKE alishba@DESKTOP-S3K0VA5
The key's randomart image is:
+--[ED25519 256]--+
|
```

2. Generate SSH Keys & Test Connection

```
alishba@DESKTOP-S3K0VA5: x + v
The key's randomart image is:
+--[ED25519 256]--+
|
|  . . .
| oS* o o=
| +.= B o +*
| .E.* + ==..++
| . oo +..*==o +
| ..oo..*B++o.
|
+-----[SHA256]-----+
alishba@DESKTOP-S3K0VA5:~$ cd ~/.ssh/
alishba@DESKTOP-S3K0VA5:~/.ssh$ ls
id_ed25519 id_ed25519.pub
alishba@DESKTOP-S3K0VA5:~/.ssh$ cat id_ed25519.pub
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIPJ2oH58JL/8k/QZW0ciSfKEtgnUyYFtfonaLU3k1+Q1 alishba@DESKTOP-S3K0VA5
alishba@DESKTOP-S3K0VA5:~/.ssh$ ssh -T git@github.com
The authenticity of host 'github.com (20.207.73.82)' can't be established.
ED25519 key fingerprint is SHA256:+DiY3wvvV6TuJJhbpZisF/zLDA0zPMSvHdkr4UvCOqU.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'github.com' (ED25519) to the list of known hosts.
Hi Alishba-Alvi! You've successfully authenticated, but GitHub does not provide shell access.
alishba@DESKTOP-S3K0VA5:~/.ssh$
alishba@DESKTOP-S3K0VA5:~/.ssh$ git clone git@github.com:Alishba-Alvi/Asm-Test.git
Cloning into 'Asm-Test'...
remote: Enumerating objects: 12, done.
remote: Counting objects: 100% (12/12), done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 12 (delta 0), reused 9 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (12/12), done.
alishba@DESKTOP-S3K0VA5:~/.ssh$ gcc --version
```

Part C: C Programming Environment & Practice

Step 1: Install Build Tools



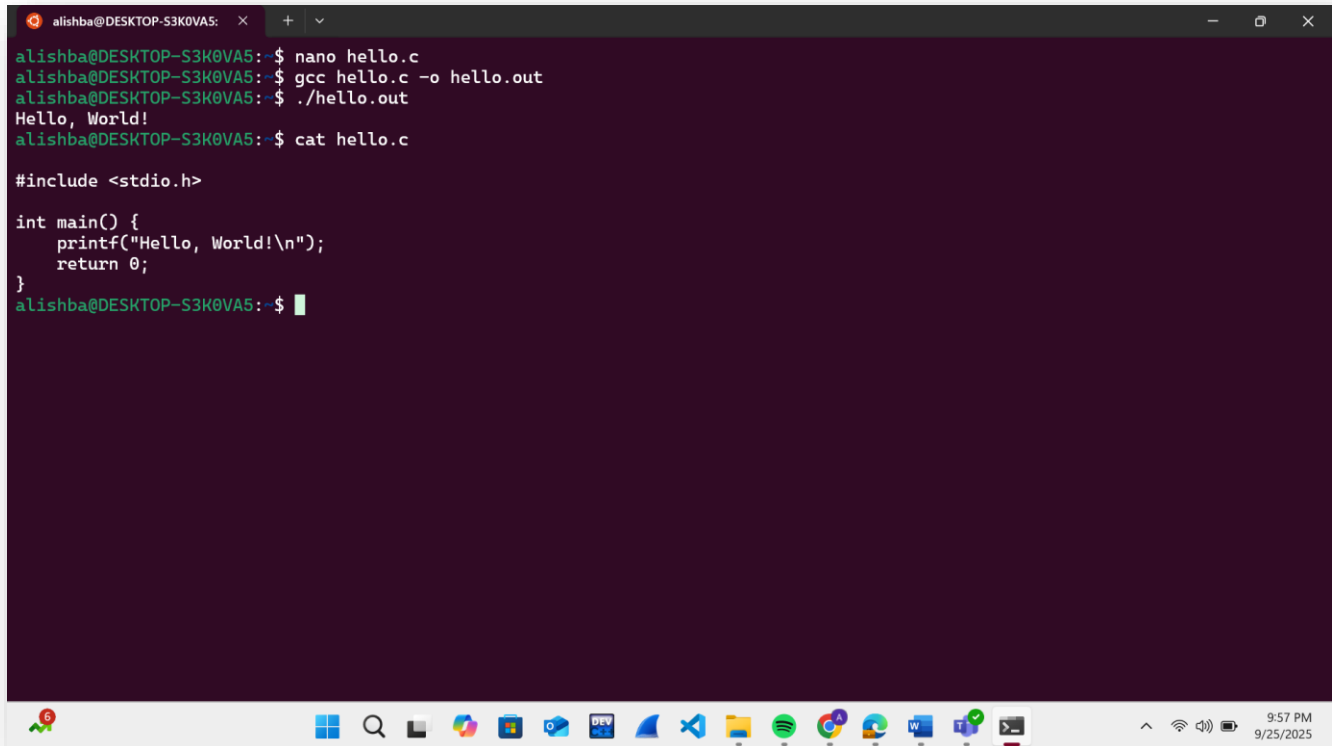
```
alishba@DESKTOP-S3K0VA5: ~$ sudo apt install build-essential
[sudo] password for alishba:
Sorry, try again.
[sudo] password for alishba:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
build-essential is already the newest version (12.10ubuntu1).
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
alishba@DESKTOP-S3K0VA5: ~$ gcc --version
gcc (Ubuntu 13.3.0-6ubuntu2~24.04) 13.3.0
Copyright (C) 2023 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

alishba@DESKTOP-S3K0VA5: ~$
```

Step 2: How to run a C Program

(a guide to run c program)

Step 3: Write a C Program



The image shows a Windows terminal window with a dark purple background. The window title is 'alishba@DESKTOP-S3K0VA5:'. The terminal displays the following commands and output:

```
alishba@DESKTOP-S3K0VA5:~$ nano hello.c
alishba@DESKTOP-S3K0VA5:~$ gcc hello.c -o hello.out
alishba@DESKTOP-S3K0VA5:~$ ./hello.out
Hello, World!
alishba@DESKTOP-S3K0VA5:~$ cat hello.c

#include <stdio.h>

int main() {
    printf("Hello, World!\n");
    return 0;
}
alishba@DESKTOP-S3K0VA5:~$
```

The Windows taskbar is visible at the bottom, showing various application icons and the system clock indicating 9:57 PM on 9/25/2025.