

Faculty of Computing

Year 2 Semester 2 (2026)

IT2130 - Operating Systems and System
Administration

Lab Sheet 1

Objectives: In the end of this practical the students will be able to get familiar with UNIX environment and they will be able to understand the basic syntaxes of a C program.

The practical sessions of Operating Systems and System Administration are conducted in Ubuntu operating system. Ubuntu is a type of UNIX operating system. The Unix Operating systems are a family of powerful, multitasking, multi-user systems known for stability, security, and portability.

1. Introduction to Ubuntu environment and the terminal

Once you log in to the windows Operating System, the desktop appears.

Step 1: You can double click on the Ubuntu 22 folder and open it.

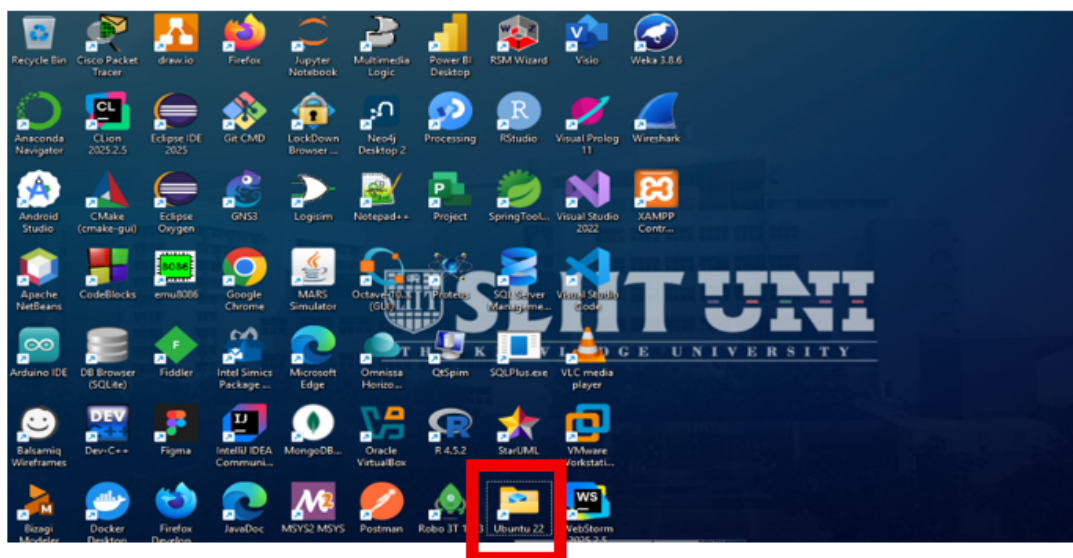


Figure 1: Windows Desktop with Ubuntu 22 folder

Step 2: Now you get the file open window as shown in the figure 2. Then double click on the Ubuntu 22 virtual box machine and open the virtual machine.

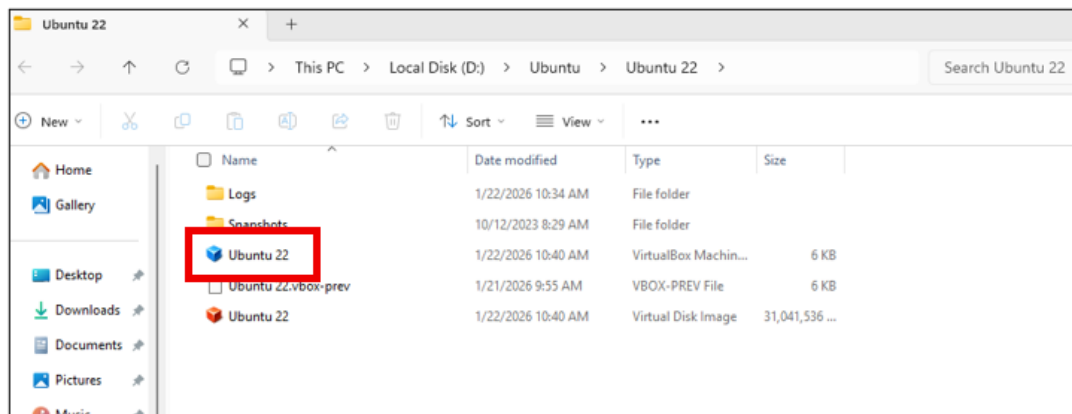


Figure 2: View of Ubuntu 22 VirtualBox Machine

Step 3: Then you will direct into the login screen of Ubuntu and give the below username and the password.

Username: slitstu

Password: student321

Then you will get the Ubuntu desktop as shown in figure 3.

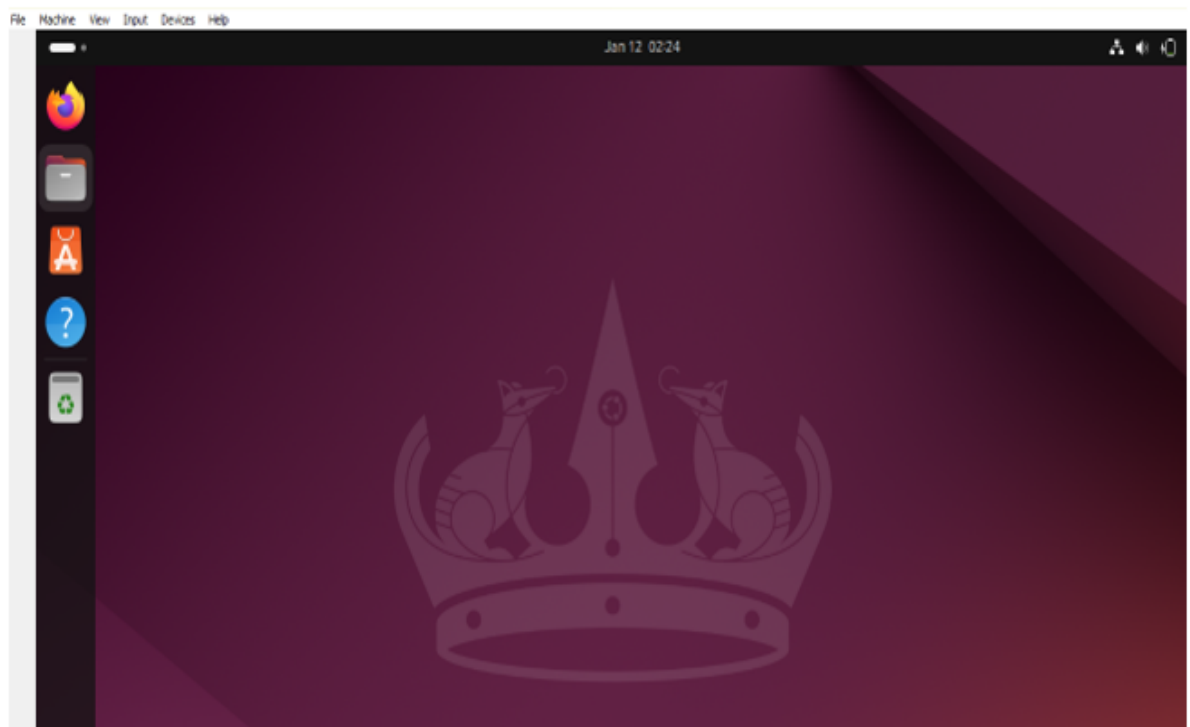


Figure 3: Desktop of Ubuntu

Step 4: Take a new terminal (This refers to creating a shell)

Click on the top of the left side of the screen to get the search bar and type the term “Terminal” to create a new terminal. Then the new terminal will display as given in the figure.

It consists of the prompt for the user to enter the commands.

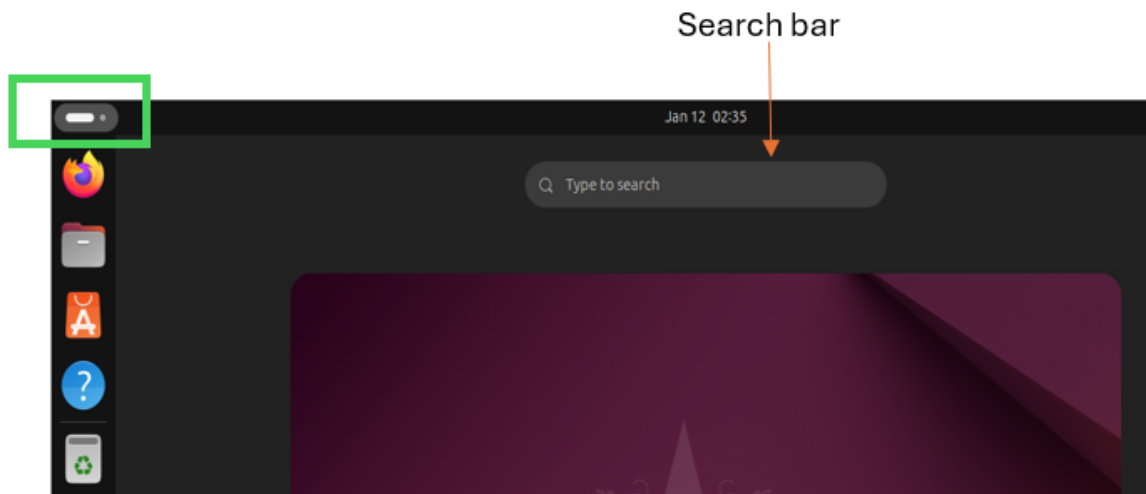


Figure 4: Ubuntu Search bar

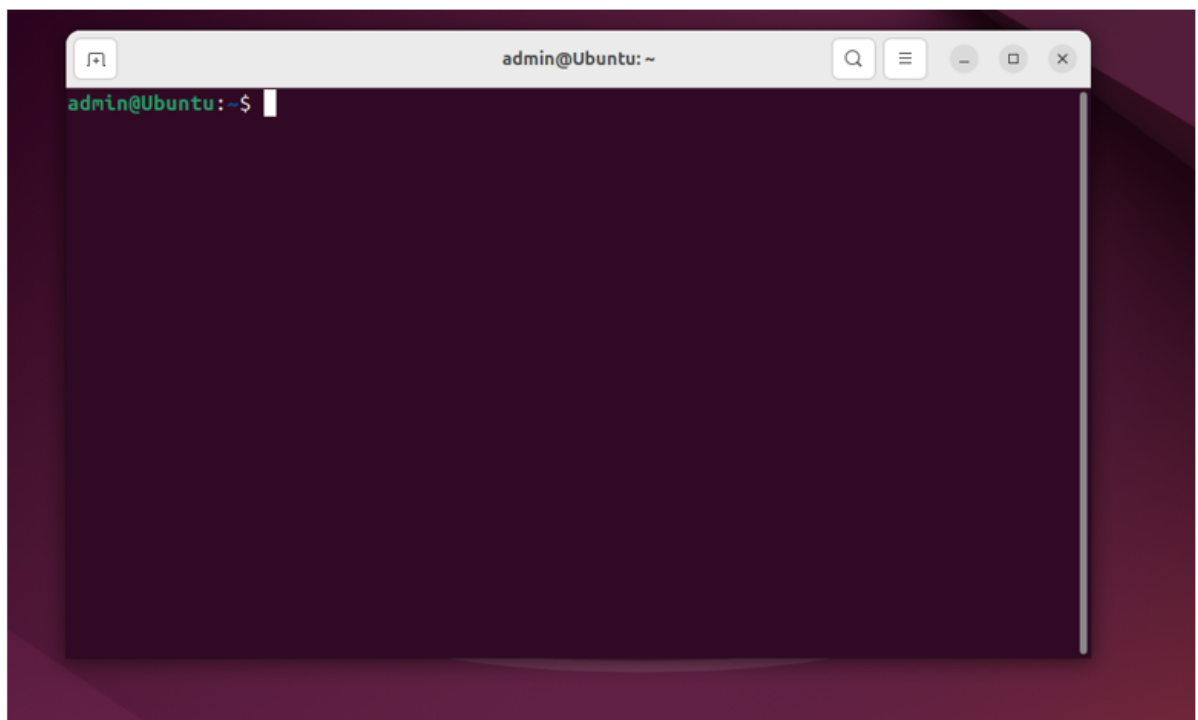


Figure 5: Ubuntu Terminal

Prompt of Ubuntu terminal

admin@Ubuntu : ~\$

- **admin** - This is the username of the currently logged-in user.
- **Ubuntu** - This is the hostname / name of the computer. It is often set during OS installation.
- **@** - this is the separator of the username from the computer name.

2. Hello World Program in C

Step 1: Create a file to write the program

- Type the command `nano first.c`
- **nano** – the editor uses to write the program
- **first.c** – name of the C program file

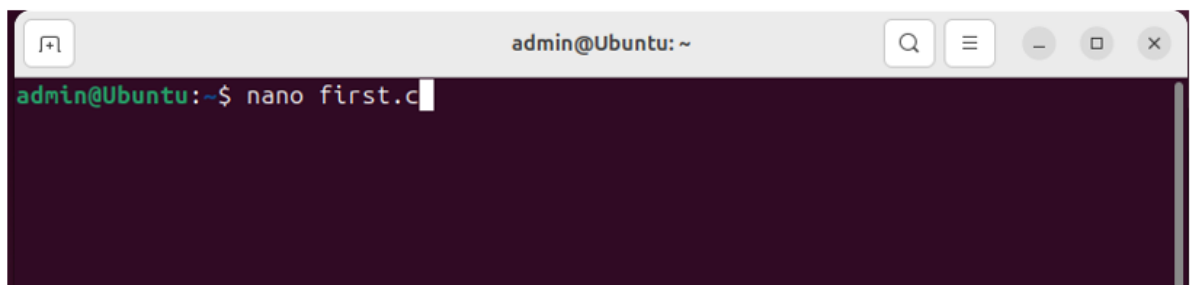


Figure 6: Opening the nano editor to create a new C file

then the editor will open for you to write the program.

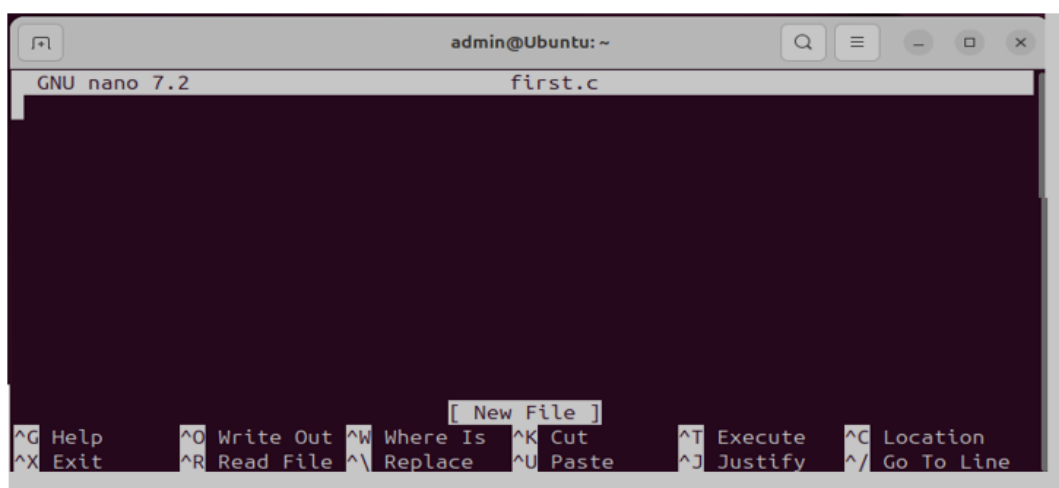


Figure 7: Opened nano editor interface

Step 2: Type the C program given below.

```
#include <stdio.h>

int main()
{
    printf("Hello World\n");
    return 0;
}

#include <stdio.h>           // Include the stdio header file to the C program
int main()                  // The main method
printf("Hello World\n");    // Print the message with formatting
return 0;
```

Step 3: Save the program file

Once you finish writing the program, press Ctrl + O and Enter in the keyboard to save the file.

Ctrl + O and Enter

To exit the nano editor, you can press Ctrl + X. Then you will direct to the terminal.

Step 4: Compile the program file

In the terminal, type the command below to compile and execute the program.

gcc -o first first.c

- **gcc** – The standard GNU C Compiler
- **-o first** – create the object code (-o for object, first is the name of the object file)
- **first.c** – name of the C program file

Step 5: Execute the program

Now, you can type, **./first** to execute the program. Here the first is the name of the object you created during the compilation.

Activity 1

Write a C program to display your name, country and the university in the format below.

```
*****
      Abraham Silberschatz
      America
      Yale University
*****
```

3. Data types and variables in C

In C, variables directly represent memory locations, not objects. There are three primitive data types in C.

- (a) Integer – int
- (b) Decimal – float, double
- (c) Character – char

When you want to have variables in the program, you need to declare them before the use. The names of the variables are case sensitive and no keywords are allowed.

```
#include <stdio.h>

int main() {
    int a = 10;
    int b = 20;
    int sum;

    sum = a + b;

    printf("Sum = %d", sum);
    return 0;
}
```

The sum of a and b are calculated and printed using the above program. Observe the use of %d in the above program. It is a format specifier or the placeholder for an integer. It tells to get the integer value of sum and print here.

Activity 2

Write a C program that reads the marks obtained for an exam and homework, each out of 100. The final course score is calculated by taking 50% of the exam marks and 50% of the homework marks.

Use the following formula:

- $\text{Score1} = \text{exam_marks} \times (50 / 100.0)$
- $\text{Score2} = \text{homework_marks} \times (50 / 100.0)$
- $\text{Overall_Score} = \text{Score1} + \text{Score2}$

Display the calculated overall course score.

Activity 3

Change the program you wrote in above activity 2 with the formula below.

- $\text{Score1} = \text{exam_marks} \times (50 / 100)$
- $\text{Score2} = \text{homework_marks} \times (50 / 100)$

Observe the output and explain the reason for the observation.

Activity 4

Write a C program to calculate the summation of two integer values that input from the keyboard.

Hint:

Keyboard input statement in C - `scanf()`
`int marks;`
`scanf("%d", &marks);`

The `scanf()` method accepts an integer input through **%d**, to the marks variable and the exact memory location of the marks variable is given by **&marks**.