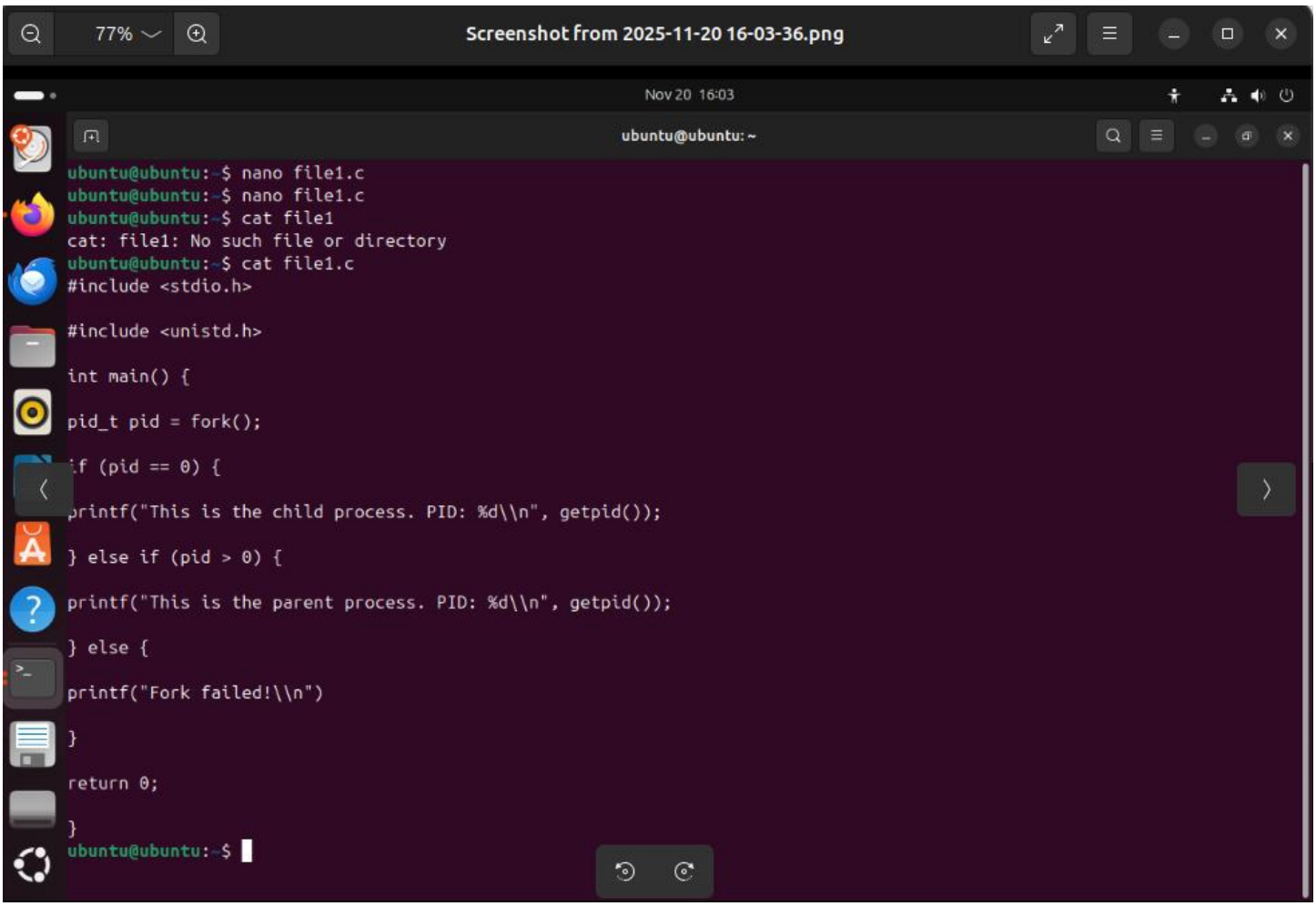
Assignment_2

Task-1 :

First, I installed the GCC to run the C programs using this command :

sudo apt install gcc

Now I'm ready to make a .c file and write the code :

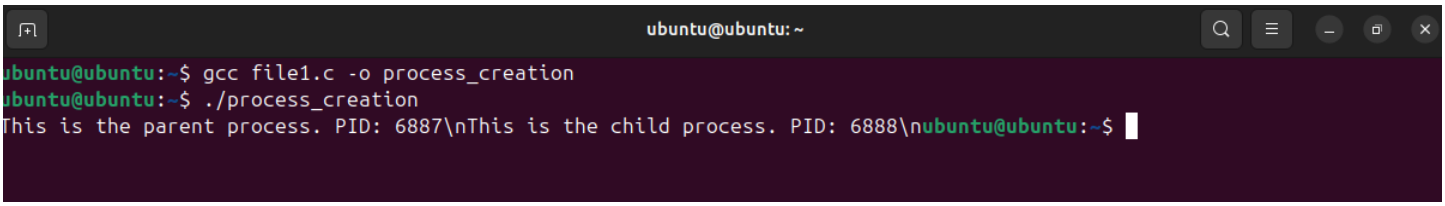


But before running, what this code actually do !!?

First, I import the libraries that I need to IO and to use fork()

Fork() is a system call that create a process on linux , every process have a unique PID ,so we assign PID variable of type pid_t to the fork() to make operations in the processes PIDs, fork returns 0 if there is a child process so I check using if condition and returns a statement and the PID of this process, if the PID>0 then it was a parent process the I make the same thing as before, if fork returns -1 that means it's failed so I handled it.

After understanding the code Now, we can run :)



As expected it displays the child and parent with there PIDs.

Task-2:

We should create two files and link them, the files names : file1.c , file2.c

Every file has a simple code to test that the linker works.

File2.c:

```
ubuntu@ubuntu:~$ nano file2.c
ubuntu@ubuntu:~$ cat file2.c
#include <stdio.h>

void hello() {

printf("Hello from file1!\\n");

}
ubuntu@ubuntu:~$
```

It includes function called hello() that prints the statement when it called.

File3.c:

```
ubuntu@ubuntu:~$ cat file3.c
void hello();

int main() {

hello();

return 0;

}
ubuntu@ubuntu:~$
```

Make a function declaration then it called into the main.

Our Goal to link this two files, so we use the commands:

gcc file2.c file2.c -o output

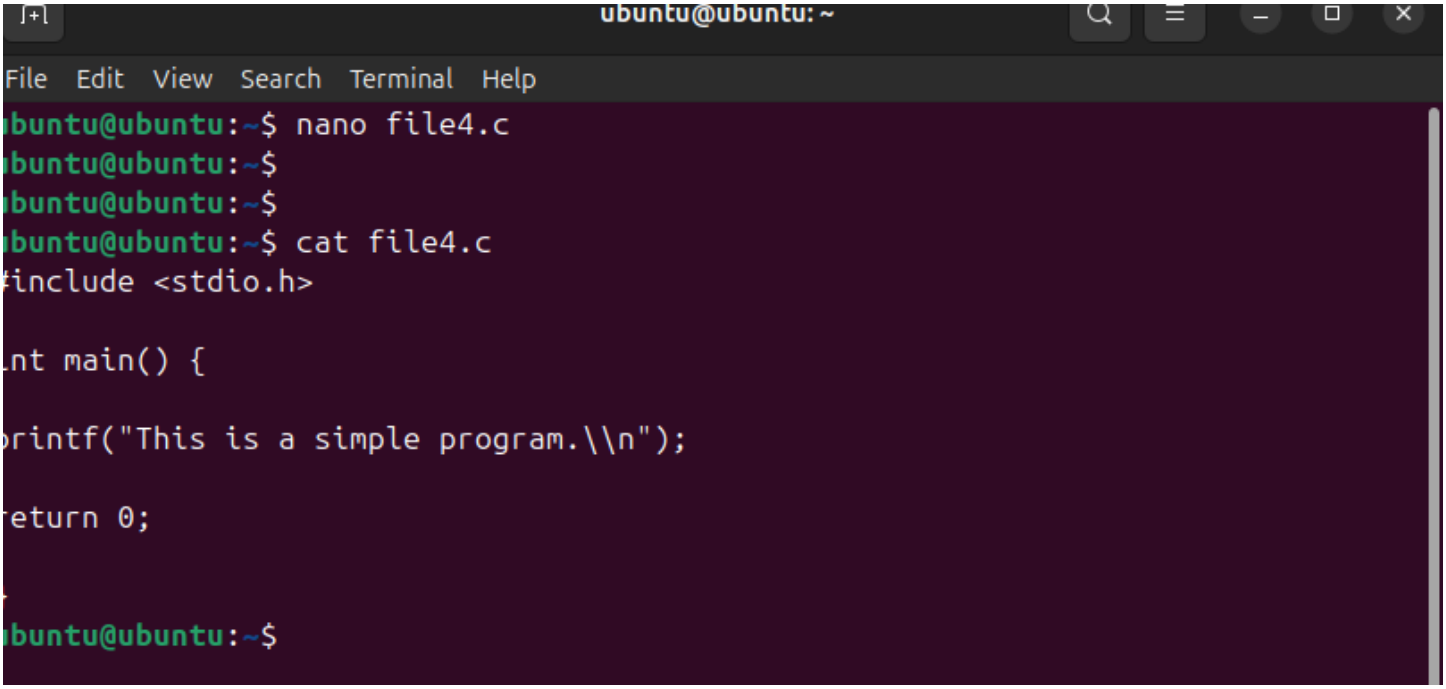
./output

```
ubuntu@ubuntu:~$ gcc file2.c file3.c -o output
ubuntu@ubuntu:~$ ./ output
bash: ./: Is a directory
ubuntu@ubuntu:~$ ./output
Hello from file1!\nubuntu@ubuntu:~$ -
```

It runs successfully and prints the statement.

Task-3:

We should write a program to inspect the libraries it uses with ldd (loader):



Very simple program that prints a statement.

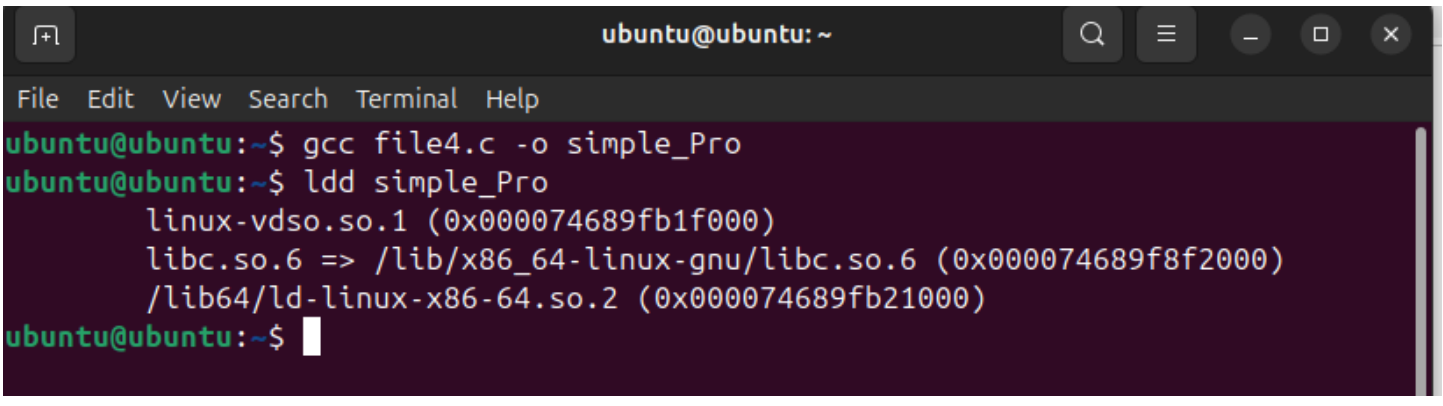
Now we should run this program:

gcc file4.c -o simple_pro

we should find an output named simple_pro. Use

ldd to list the dynamic libraries:

ldd simple_pro



the libraries that added dynamically was displayed !

Makefile:

I want to make a tool that compiles the programs I write in several files, i make a search to learn how to do it , and I find that source [Makefile Tutorial By Example](#) .

Then I write the code into makefile file like that:

Code Blame Raw

```
1   CC = gcc
2   CFLAGS = -Wall
3   # Default target: build all tasks
4   all: task1 task2 task3
5   task1: file1.c
6       $(CC) $(CFLAGS)  file1.c -o task1
7   task2: file2.c file3.c
8       $(CC) $(CFLAGS) file2.c file3.c -o task2
9   task3: file4.c
10      $(CC) $(CFLAGS) file4.c -o task3
11  clean:
12      rm -f task1 task2 task3
```

Let's break down the difficult parts, I used -wall to make sure the file executed as I want and return to me a statement for that, all files putted in something like switch in java, and I make the linker between file1 and file2 as required, at the end I clean the results files if you tell the program.

That’s All, we Write the code examples, Explain each one and what it does, and take Screenshots of compiling and running the code.