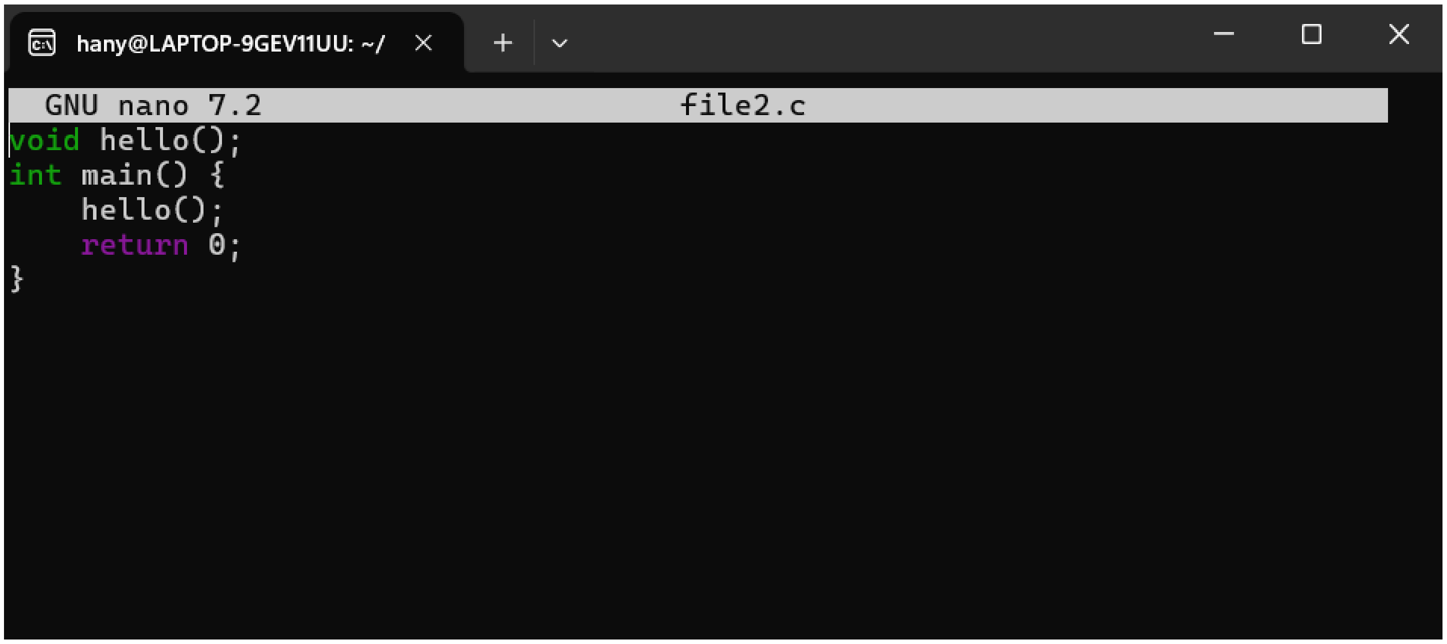
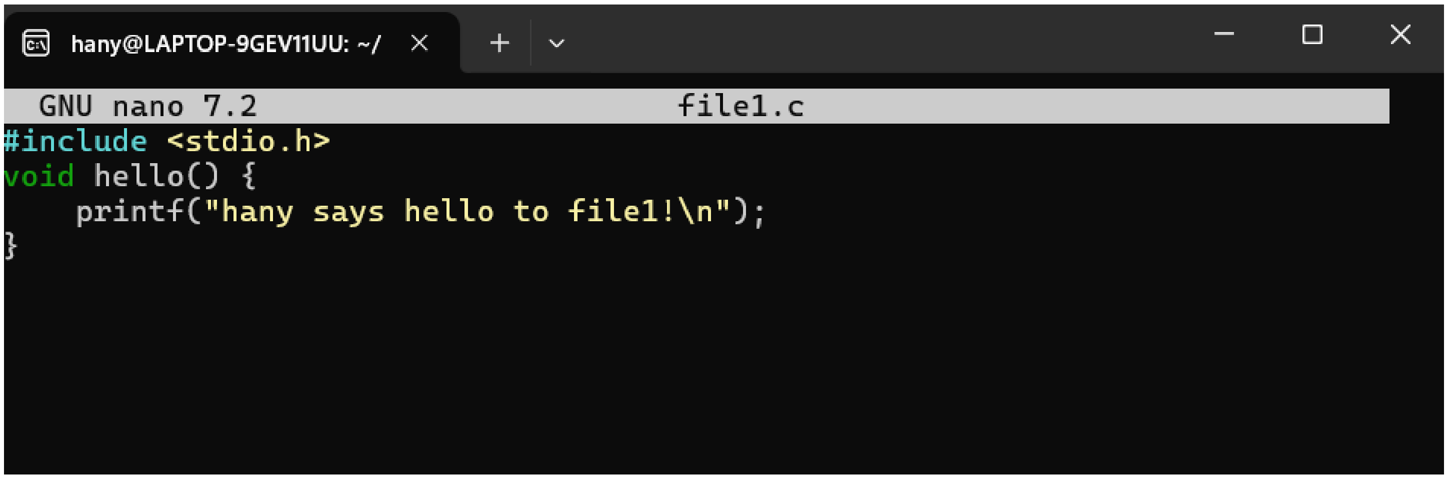
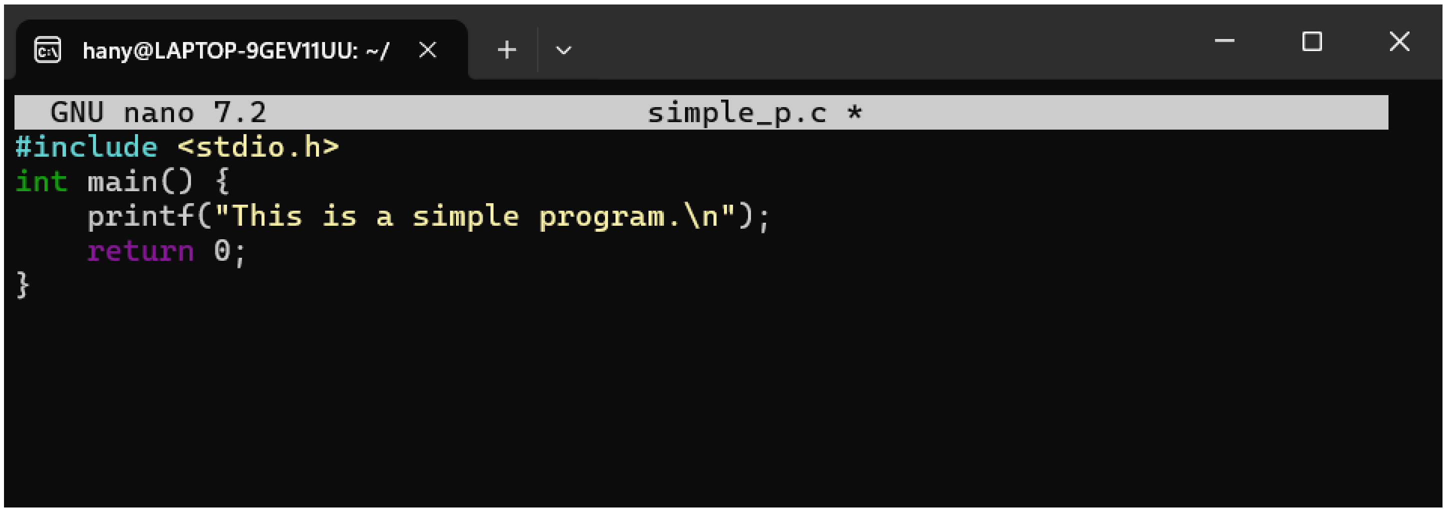


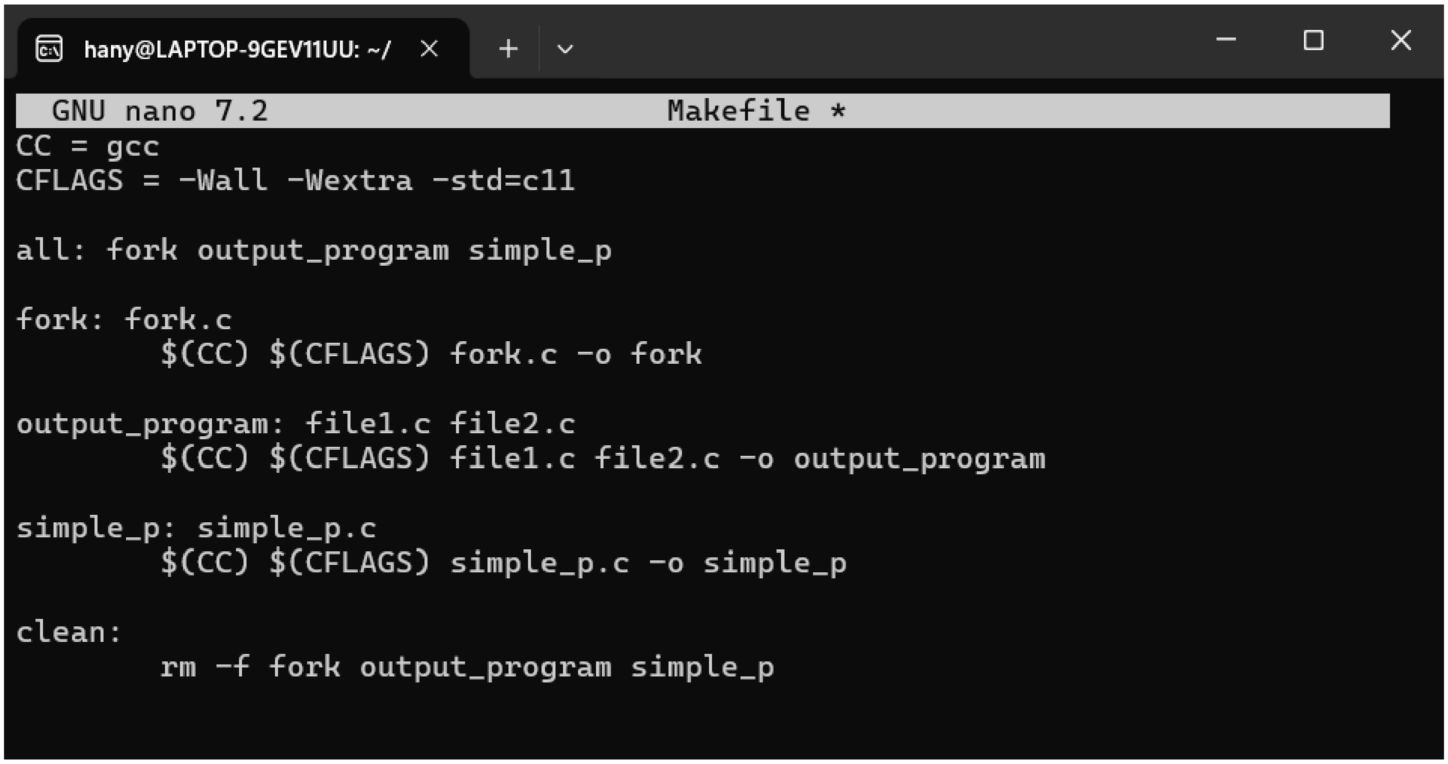
```
  GNU nano 7.2                          file2.c
void hello();
int main() {
    hello();
    return 0;
}
```



```
  GNU nano 7.2                          file1.c
#include <stdio.h>
void hello() {
    printf("hany says hello to file1!\n");
}
```

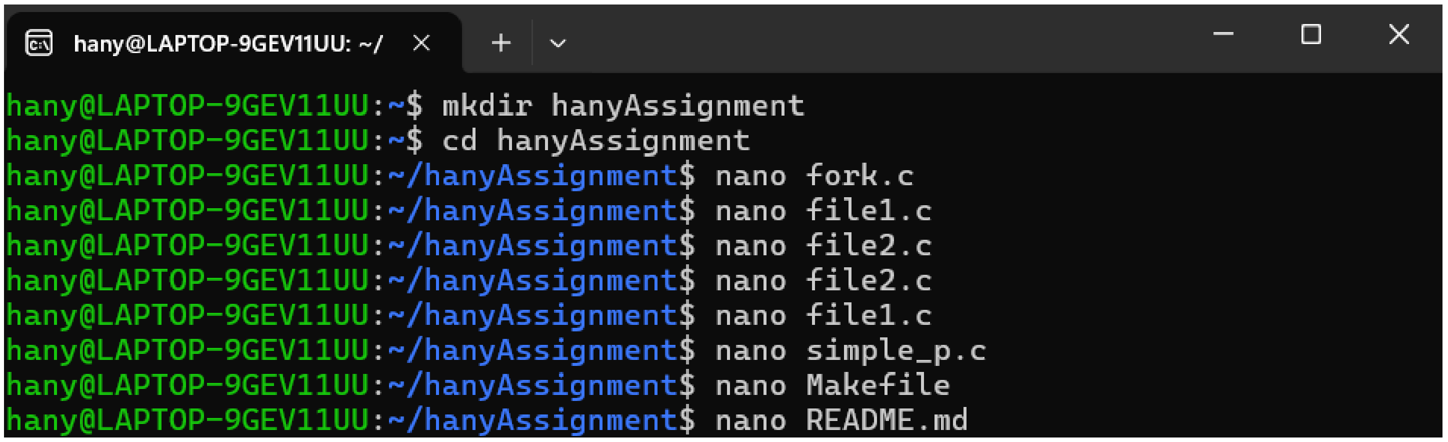


```
  GNU nano 7.2                          simple_p.c *
#include <stdio.h>
int main() {
    printf("This is a simple program.\n");
    return 0;
}
```



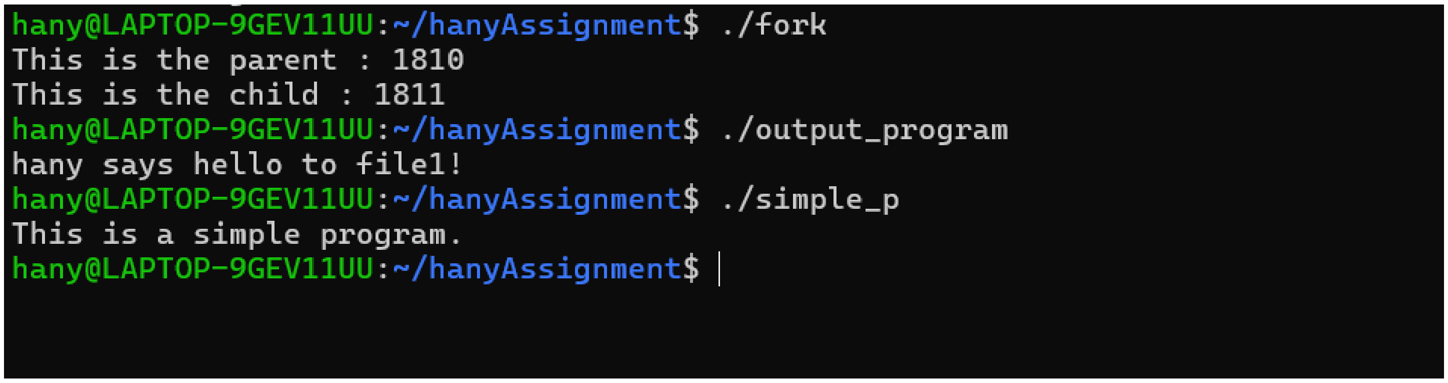
hany@LAPTOP-9GEV11UU: ~/

```
  GNU nano 7.2                          Makefile *
CC = gcc
CFLAGS = -Wall -Wextra -std=c11

all: fork output_program simple_p

fork: fork.c
        $(CC) $(CFLAGS) fork.c -o fork

output_program: file1.c file2.c
        $(CC) $(CFLAGS) file1.c file2.c -o output_program

simple_p: simple_p.c
        $(CC) $(CFLAGS) simple_p.c -o simple_p

clean:
        rm -f fork output_program simple_p
```

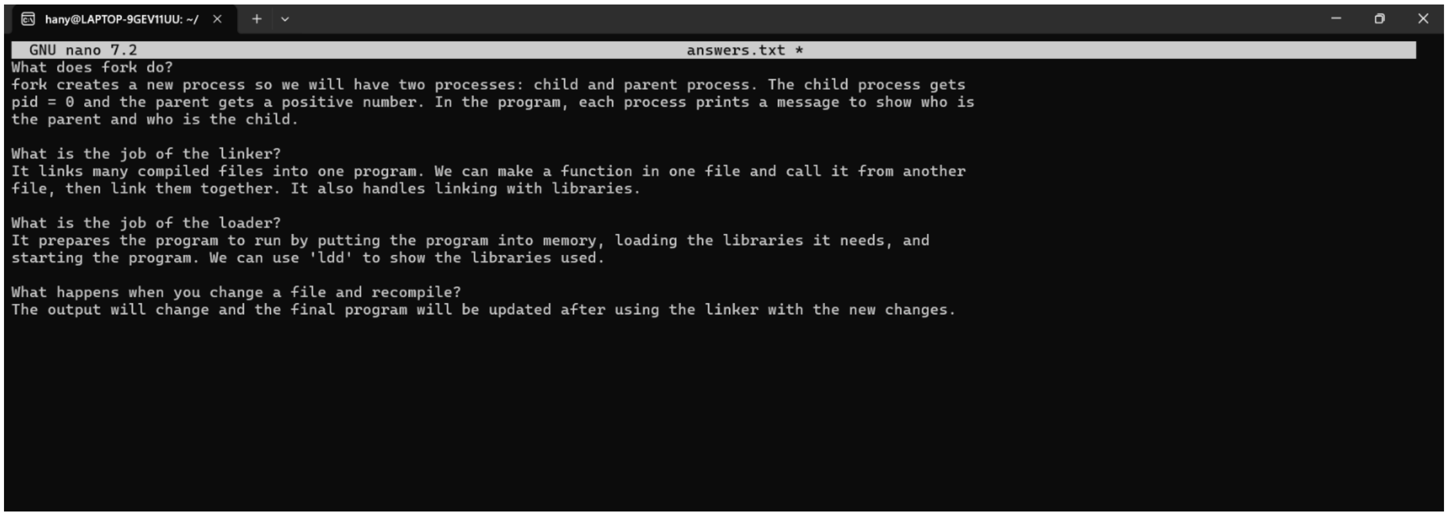


hany@LAPTOP-9GEV11UU: ~/

```
hany@LAPTOP-9GEV11UU:~$ mkdir hanyAssignment
hany@LAPTOP-9GEV11UU:~$ cd hanyAssignment
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano fork.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano file1.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano file2.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano file2.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano file1.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano simple_p.c
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano Makefile
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano README.md
```

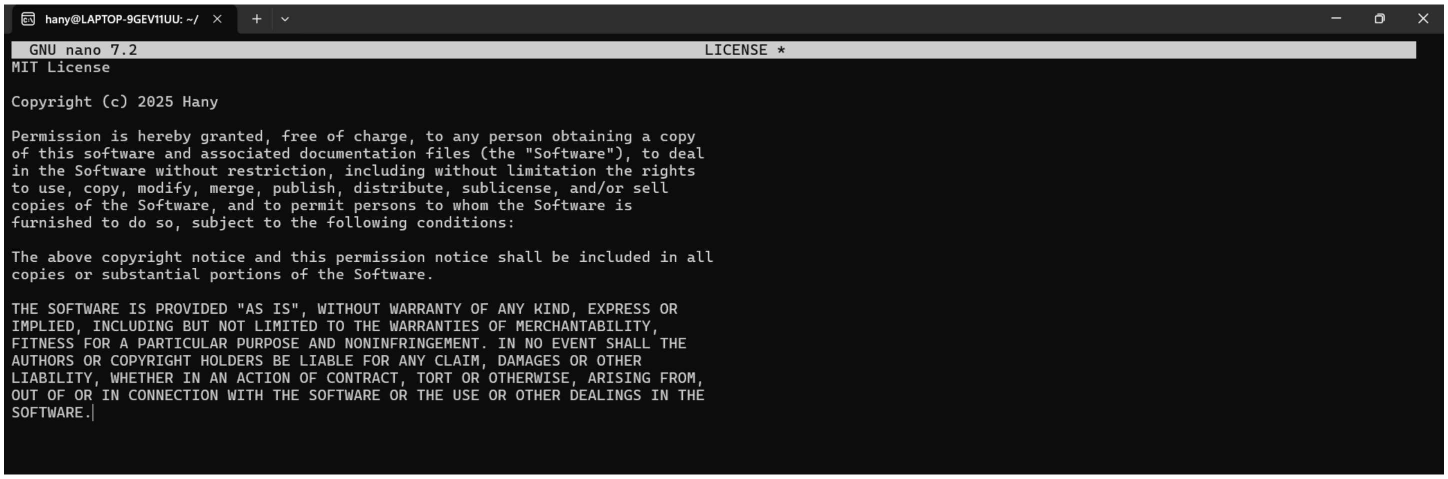


```
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./fork
This is the parent : 1810
This is the child : 1811
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./output_program
hany says hello to file1!
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./simple_p
This is a simple program.
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ 
```



hany@LAPTOP-9GEV11UU: ~/

```
 GNU nano 7.2                                    answers.txt *
What does fork do?
fork creates a new process so we will have two processes: child and parent process. The child process gets
pid = 0 and the parent gets a positive number. In the program, each process prints a message to show who is
the parent and who is the child.

What is the job of the linker?
It links many compiled files into one program. We can make a function in one file and call it from another
file, then link them together. It also handles linking with libraries.

What is the job of the loader?
It prepares the program to run by putting the program into memory, loading the libraries it needs, and
starting the program. We can use 'ldd' to show the libraries used.

What happens when you change a file and recompile?
The output will change and the final program will be updated after using the linker with the new changes.
```



hany@LAPTOP-9GEV11UU: ~/

```
 GNU nano 7.2                                    LICENSE *
MIT License

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OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE
SOFTWARE.
```
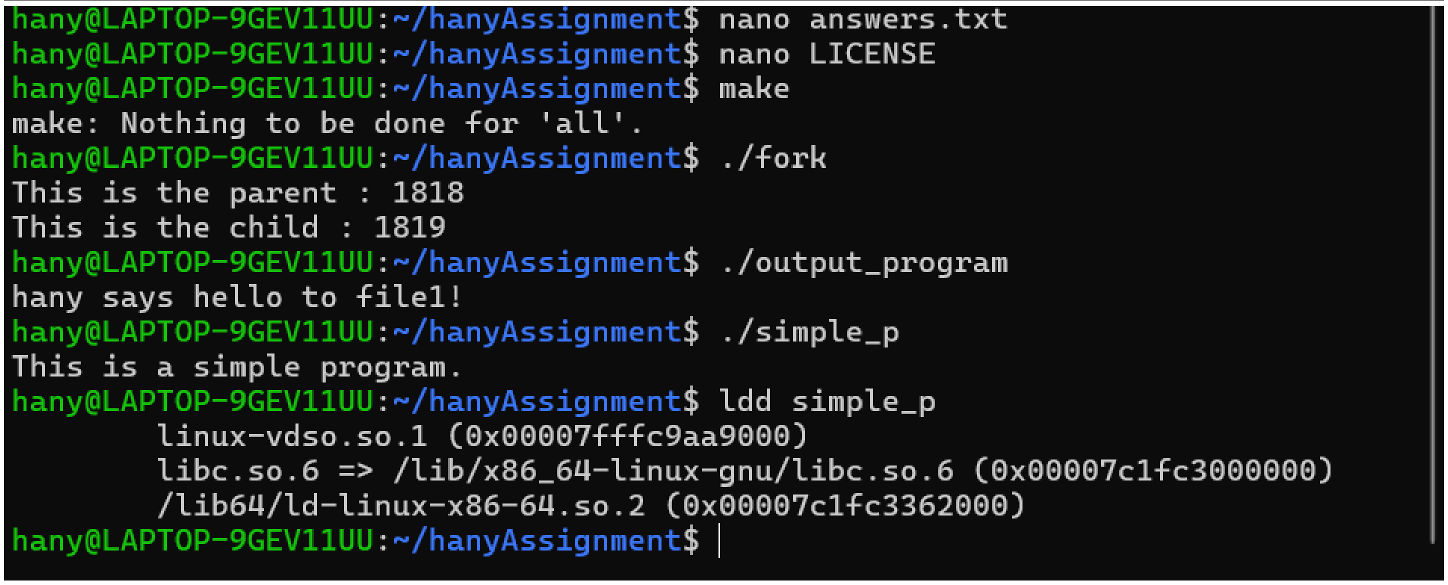
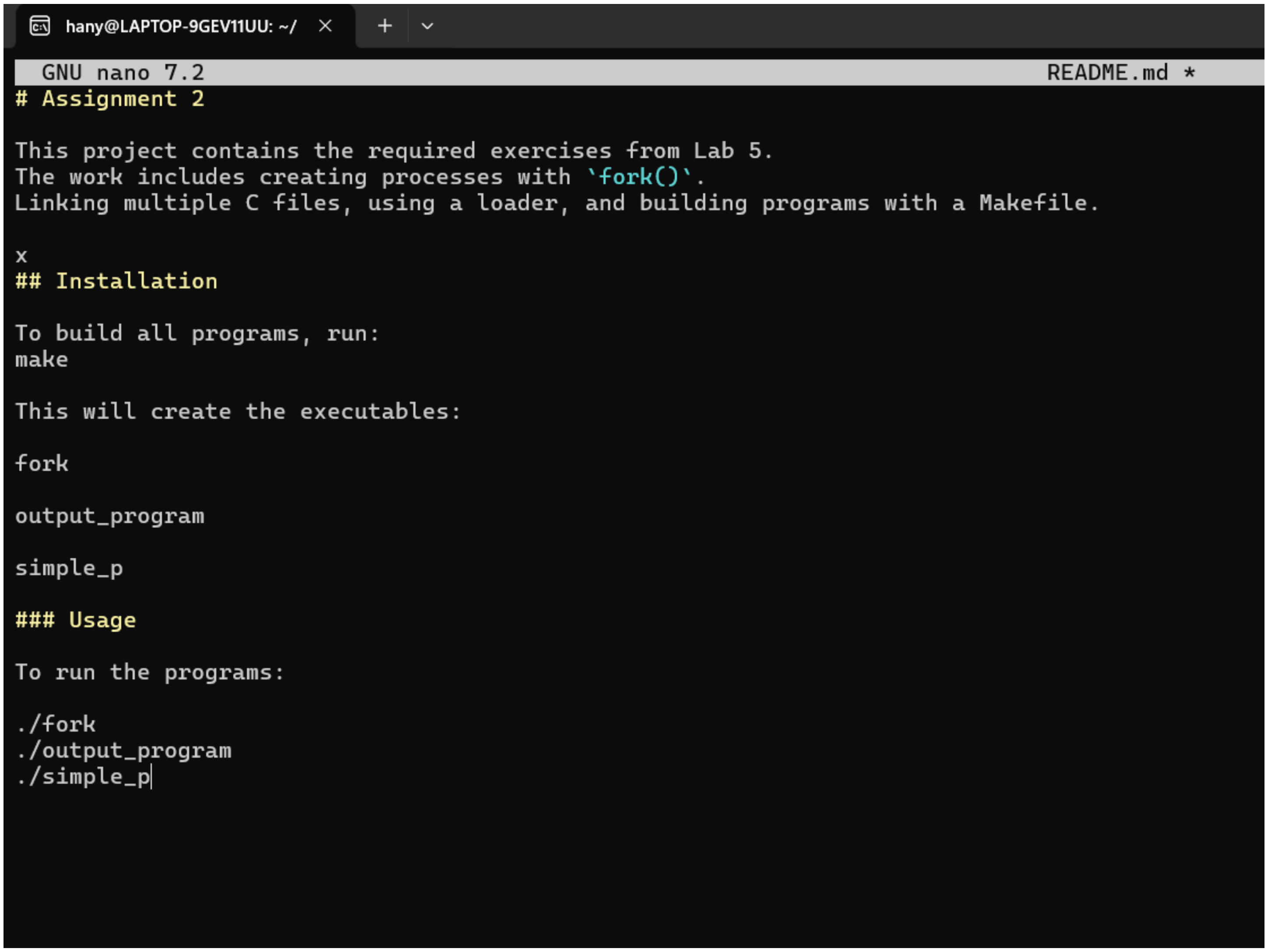
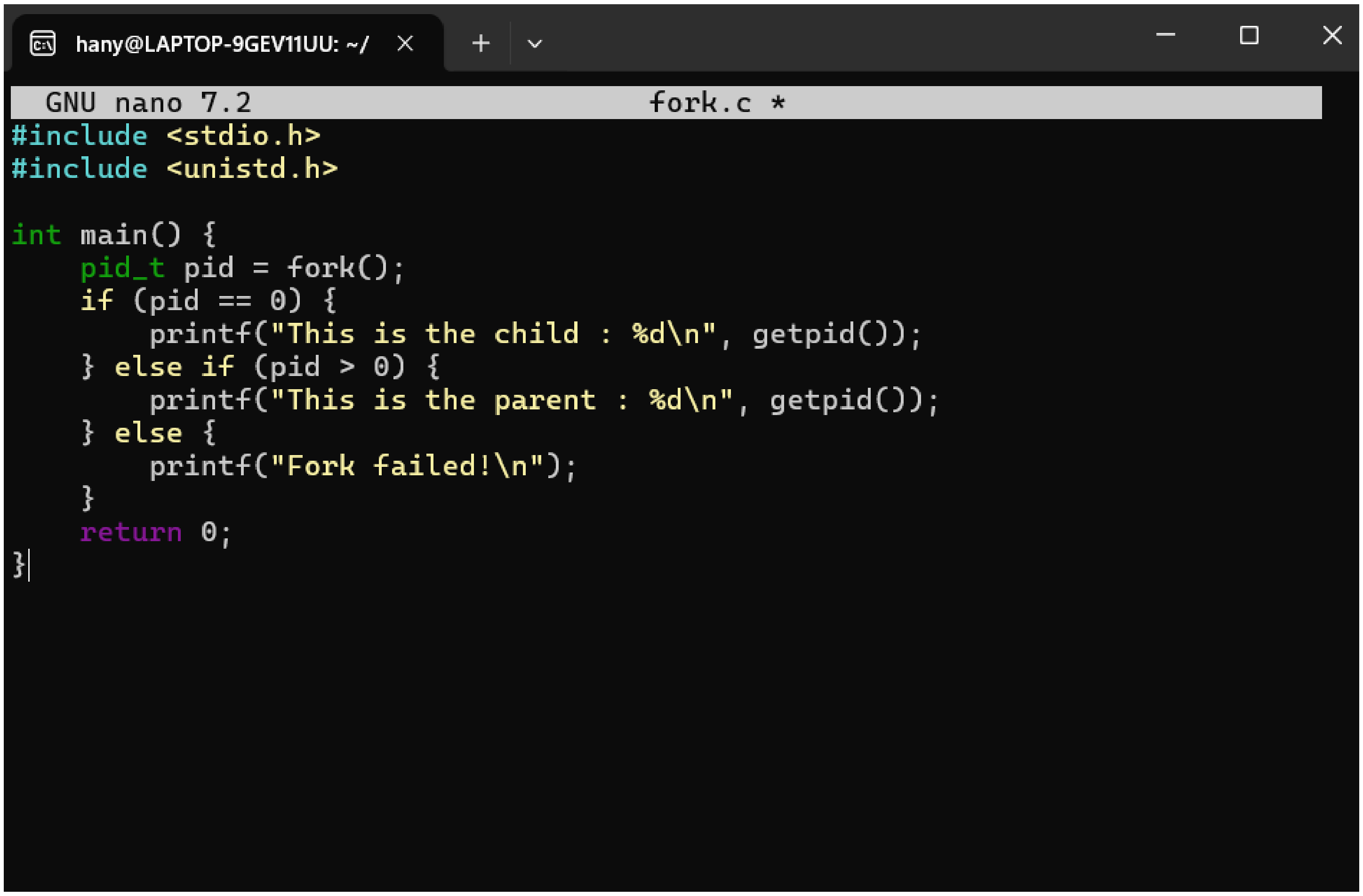



```
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano answers.txt
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ nano LICENSE
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ make
make: Nothing to be done for 'all'.
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./fork
This is the parent : 1818
This is the child : 1819
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./output_program
hany says hello to file1!
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ./simple_p
This is a simple program.
hany@LAPTOP-9GEV11UU:~/hanyAssignment$ ldd simple_p
        linux-vdso.so.1 (0x00007fffc9aa9000)
        libc.so.6 => /lib/x86_64-linux-gnu/libc.so.6 (0x00007c1fc3000000)
        /lib64/ld-linux-x86-64.so.2 (0x00007c1fc3362000)
hany@LAPTOP-9GEV11UU:~/hanyAssignment$
```



hany@LAPTOP-9GEV11UU: ~/

```
  GNU nano 7.2                                                           README.md *
# Assignment 2

This project contains the required exercises from Lab 5.
The work includes creating processes with `fork()`.
Linking multiple C files, using a loader, and building programs with a Makefile.

x
## Installation

To build all programs, run:
make

This will create the executables:

fork

output_program

simple_p

### Usage

To run the programs:

./fork
./output_program
./simple_p
```



```
  GNU nano 7.2                         fork.c *
#include <stdio.h>
#include <unistd.h>

int main() {
    pid_t pid = fork();
    if (pid == 0) {
        printf("This is the child : %d\n", getpid());
    } else if (pid > 0) {
        printf("This is the parent : %d\n", getpid());
    } else {
        printf("Fork failed!\n");
    }
    return 0;
}
```