Experiment 07

Aim: Building C project using Makefile

Introduction

- When working on large projects with multiple source files, compiling each file manually becomes inefficient.
- This is where **Makefile** comes in, it automates the compilation process, reducing repetitive tasks and improving efficiency.

Components of the Example Project

The given example demonstrates building a simple project using a Makefile with four key files:

1. **hellomake.c**
    - This is the main file that calls the function myPrintHelloMake().

```
localhost:~# mkdir C_Project
localhost:~# cd C_Project
localhost:~/C_Project# vi hellomake.c
```

```
#include <hellomake.h>
int main() {
    myPrintHelloMake();
    return 0;
}
~
~
```

    - It includes hellomake.h, which contains the function prototype.
    - The main() function calls myPrintHelloMake().

2. **hellofunc.c**
    - This file defines the function myPrintHelloMake().
    - It includes the standard input-output library (stdio.h) to use printf().
    - It also includes hellomake.h to ensure function consistency across multiple files.
    - The function prints "Hello makefile!".

```
localhost:~/C_Project# vi hellofunc.c
```

```
#include <stdio.h>
#include <hellomake.h>
void myPrintHelloMake() {
    printf("Hello makefile!\n");
    return;
}
~
~
```

3. **hellomake.h**
    - This is the header file that declares the function myPrintHelloMake().
    - It ensures the function is recognized in all source files that include this header.

```
localhost:~/C_Project# vi hellomake.h
```

```
void myPrintHelloMake();
~
```

4. **Makefile**
    - A **Makefile** is used to automate the compilation process. The example Makefile contains:

```
localhost:~/C Project# vi makefile
CC = clang
CFLAG = -I.
DEPS = hellomake.h

%.o: %.c $(DEPS)
        $(CC) -c -o $@ $< $(CFLAG)

hellomake: hellomake.o hellofunc.o
        $(CC) -o hellomake hellomake.o hellofunc.o

~
```

Final Execution:

```
localhost:~/C_Project# make
clang -c -o hellomake.o hellomake.c -I.
clang -c -o hellofunc.o hellofunc.c -I.
clang -o hellomake hellomake.o hellofunc.o
localhost:~/C_Project# ./hellomake
Hello makefile!
localhost:~/C_Project#
```