LESSON 3: C programming

# Exercises 2: ProgrammingExercise > Documentation

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link: <https://dcsit.twiki.ucc.edu.gh/do/view/UCC_Course/ProgrammingExercise>

**Goal:**

*The exercise session was aimed at introducing C programming and how to compile programs.*

## Exercise 1: The code examples from the lectures

The code examples from the lectures was downloaded and put into ~/exercises/solutions/exercise\_2 directory and compiled using the command:

gcc -o hello hello.c

The binary output file will be called hello and you can execute it with ./hello.

## Exercise 2: Hello World!

We are to write the program that prints “Hello World!”. Create a directory hello in ~/exercises/solutions/exercise\_2 and create the source file hello.c .  
Compile it with the gcc command and run the program to test it (./hello)

**Description:**

The printf() function is used in this regard,hence **printf(“Hello World!”);**

## Exercise 3: A calculator

*We want to produce a calculator program capable of calculating the 4 basic calculations: addition subtraction , multiplication & division.*

*The program takes 3 arguments: the first operand followed by the operator followed by the second operand. The user should type calculate 3.4 + 5.8 and the program should print:*

*3.4 + 5.8 = 9.2*

**Description:**

it was implemented as fuction in 5 C files: calculator.c , add.c, subtr.c, mult.c, & divide.c . The various operation defined in the appropriate functions, and a main program calculator.c written that calls all the other functions it. Argument are taken at command line where the it takes 4 arguments the 1st is program name, followed the 1st operand followed by the operator, and the 2nd operator. A switch case was used to check test for the various operators.

The calculator program was compile as “ gcc -c calculator.c ” to produce an object file and that was done for all the other 4 .c programs. Then it was all compiled together

gcc -o calculator calculator.o add.o subtr.o mult.o divide.o

## **Exercise 3b: Octal and Hex Calculations**

## A Calculator program that calculates in decimal, octal and hex

**Description:**

This part was carried out as an assignment where we created a C++ calculator program.

## **Exercise 4: Calculate a sine function**

Generate 100 values for the sin(x) argument x running from 0 to 2π and write them to a file called sine.dat. You will have to add the math library when linking (add -lm argument when calling gcc). Read sine.dat with libreoffice and generate a plot. Generate a plot with gnuplot.

**Description:**

This part was carried out by generating 100 values for the “sin(x)” function. These values were between 0 and 2. The calculated sine values were directed to a file called “sine.dat” which I created. I used libre Office to read the file before plotting it’s values using “gnuplot”.

**Remarks**

From This exercise section I learnt how to compile “C” programs using the terminal. This gave me a general idea of what actually goes on in the background of the IDEs we use in programming. I also learnt how to use “gnuplot” to plot any given points.