

Answers to Assignment No. 4 - Makefile :

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The Main Program: **Central_prog.c**

```
#include <stdio.h>
#include <stdlib.h>
#include <prototypes.h>
int main()
{
    int choice;
    printf("Welcome to scientific Calculator !");
    printf("\n 1)Addition \n 2)Subtraction \n 3)Division \n
           4)Multiplication");
    printf("\nYour Choice?");
    scanf("%d",&choice);

    switch(choice)
    {
        case 1:
            Add();
        case 2:
            Subtract();
        case 3:
            Division();
        case 4:
            Multiply();
        default:
            printf("Wrong Input !");
    }

    return 0;
}
```

The Prototype Header File: **Prototypes.h**

```
void Add(void);
void Subtract(void);
void Division(void);
void Multiply(void);
```

The Function Files:

1) Add.c

```
#include <stdio.h>
#include <stdlib.h>
#include <prototypes.h>
void Add(void)
{
    int num1=0;
    int num2=0;
    printf("Enter 1st Number:");
    scanf("%d",num1);
    printf("\nEnter 2nd Number:");
    scanf("%d",num2);
    printf("\nAnswer is %d",num1+num2);
}
```

2) Subtract.c

```
#include <stdio.h>
#include <stdlib.h>
#include <prototypes.h>
void Subtract(void)
{
    int num1=0;
    int num2=0;
    printf("Enter 1st Number:");
    scanf("%d",num1);
    printf("\nEnter 2nd Number:");
    scanf("%d",num2);
    printf("\nAnswer is %d",num1-num2);
}
```

3) Multiply.c

```
#include <stdio.h>
#include <stdlib.h>
#include <prototypes.h>
void Multiply(void)
{
    int num1=0;
    int num2=0;
    printf("Enter 1st Number:");
    scanf("%d",num1);
    printf("\nEnter 2nd Number:");
    scanf("%d",num2);
    printf("\nAnswer is %d",num1*num2);
}
```

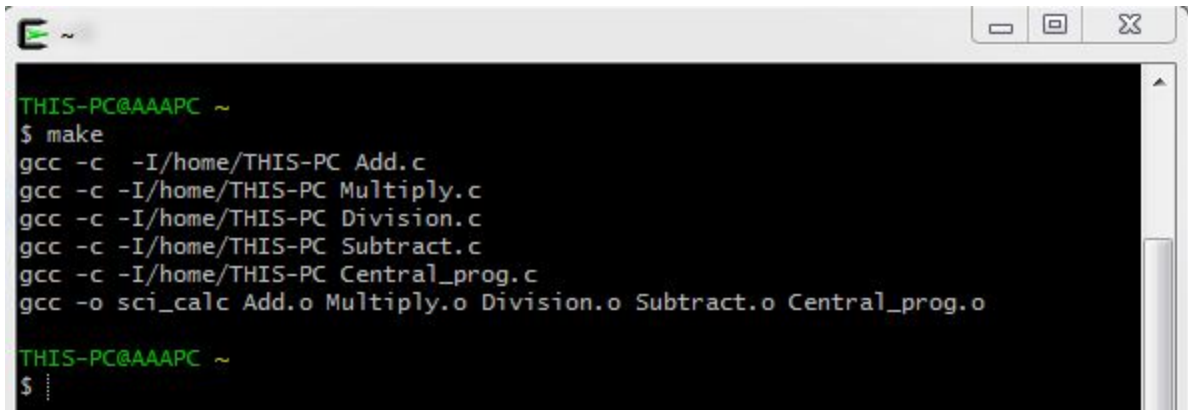
4) Division.c

```
#include <stdio.h>
#include <stdlib.h>
#include <prototypes.h>
void Division(void)
{
    int num1=0;
    int num2=0;
    printf("Enter 1st Number:");
    scanf("%d",num1);
    printf("\nEnter 2nd Number:");
    scanf("%d",num2);
    printf("\nAnswer is %d",num1/num2);
}
```

The Makefile:

```
sci_calc: Add.o Multiply.o Division.o Subtract.o Central_prog.o
    gcc -o sci_calc Add.o Multiply.o Division.o Subtract.o
Central_prog.o
Add.o : Add.c prototypes.h
    gcc -c -I/home/THIS-PC Add.c
Multiply.o : Multiply.c prototypes.h
    gcc -c -I/home/THIS-PC Multiply.c
Division.o : Division.c prototypes.h
    gcc -c -I/home/THIS-PC Division.c
Subtract.o : Add.c prototypes.h
    gcc -c -I/home/THIS-PC Subtract.c
Central_prog.o : Central_prog.c prototypes.h
    gcc -c -I/home/THIS-PC Central_prog.c
```

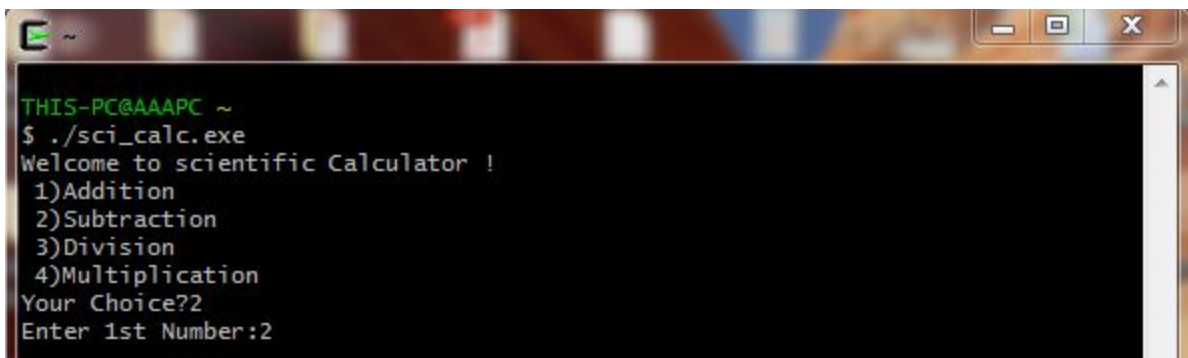
Output of “Make”:

A terminal window with a black background and green text. The prompt is 'THIS-PC@AAAPC ~'. The user enters '\$ make'. The output shows the compilation of each source file into an object file and then the linking of all object files into 'sci_calc'.

```
THIS-PC@AAAPC ~
$ make
gcc -c -I/home/THIS-PC Add.c
gcc -c -I/home/THIS-PC Multiply.c
gcc -c -I/home/THIS-PC Division.c
gcc -c -I/home/THIS-PC Subtract.c
gcc -c -I/home/THIS-PC Central_prog.c
gcc -o sci_calc Add.o Multiply.o Division.o Subtract.o Central_prog.o

THIS-PC@AAAPC ~
$
```

Sample run of Output file : “sci_calc.exe”

A terminal window with a black background and green text. The prompt is 'THIS-PC@AAAPC ~'. The user enters './sci_calc.exe'. The program outputs a welcome message and a list of operations: 1)Addition, 2)Subtraction, 3)Division, 4)Multiplication. It then asks 'Your Choice?2' and 'Enter 1st Number:2'.

```
THIS-PC@AAAPC ~
$ ./sci_calc.exe
Welcome to scientific Calculator !
1)Addition
2)Subtraction
3)Division
4)Multiplication
Your Choice?2
Enter 1st Number:2
```