CHAPTER 2 – VARIABLES, DATA TYPES, OPERATORS AND EXPRESSIONS

I. EXERCISES WITH SOLUTION

Exercise 1: Write C instructions to declare integer variable i, float variable f, character variable ch.

Solution:

int i; //declare variable i has integer data type

float f;//declare variable f has float data type

char ch;//declare variable ch has character data type

Exercise 2: Using C syntax to represent mathematical expression below:

a) $y = \dfrac{x+2}{x-9} + 7.x^2$

b) $T = 2.\pi\sqrt{\dfrac{l}{g}}$

Solution:

   a) y = (x+2)/(x-9) + 7*x*x;

   b) T=2*M_PI*sqrt(l/g);

   Where: M_PI is const that represent π and sqrt is square root function in math library.

Exercise 3: Write C program to calculate total of three integer numbers input from keyboard and display total to screen.

Solution:

- **Pseudo code:**

BEGIN

INPUT firstNumber

INPUT secondNumber

INPUT thirdNumber

sum = firstNumber + secondNumber + thirdNumber

DISPLAY sum

END

- **C code**

```c
/*Program to calculate total of three integer numbers
input from keyboard and display total to screen.
date writen:24.06.2008
author:
version:1*/
#include<stdio.h>
#include<conio.h>
void main(void)
{
    //declare variable
    int firstNumber;
    int secondNumber;
    int thirdNumber;
    int sum;
    //Clear screen
    clrscr();
    printf("\nEnter the first number please:");
    scanf("%d",&firstNumber);
    printf("\nEnter the second number please:");
    scanf("%d",&secondNumber);
```

```
    printf("\nEnter the third number please:");
    scanf("%d",&thirdNumber);
    sum=firstNumber+secondNumber+thirdNumber;
    printf("\nTotal of three number is:%d",sum);
    printf("\nPress any key to continue...");
    getch();//stop screen to view result


}
```

Exercise 4: Write a program to swap two whole numbers input from keyboard and display them to screen.

Solution:

- **Pseudo code**

BEGIN

    INPUT firstNumber

    INPUT secondNumber

    temp = firstNumber

    firstNumber=secondNumber

    secondNumber=temp

    DISPLAY firstNumber,secondNumber

  END

- **C code**

```
/*Program to swap two whole number
input from keyboard and display them to screen.
date writen:24.06.2008
author:
version:1*/
#include<stdio.h>
```

```c
#include<conio.h>
void main(void)
{
    //declare variable
    int firstNumber;
    int secondNumber;
    int temp;
    //Clear screen
    clrscr();
    printf("\nEnter the first number please:");
    scanf("%d",&firstNumber);
    printf("\nEnter the second number please:");
    scanf("%d",&secondNumber);
    printf("\nValue before swapping:%d  %d",firstNumber,secondNumber);
    temp=firstNumber;
    firstNumber=secondNumber;
    secondNumber=temp;
    printf("\nValue after swapping:%d
%d",firstNumber,secondNumber);
    printf("\nPress any key to continue...");
    getch();//stop screen to view result
}
```

II. EXERCISES WITHOUT SOLUTION

Exercise 1: Using C syntax to represent mathematical expression below:

a) $y = \dfrac{x^2 - 5}{x^2 + 1}$

b) $T = 2.\pi\sqrt{\dfrac{k}{m}}$

Exercise 2: Write C program to calculate area and perimeter of circle that has radius input from keyboard and display result to screen.

Exercise 3: Write C program to reserve three whole numbers input from keyboard and display them.

Hint: Swap first number and third number.

Exercise 4: Write C program to calculate the monthly repayment M on a customer loan by entering from the keyboard the principal P, at an annual interest rate of R% pa., over a period of T years where M=P(1+RT/100)/(12T). All inputs and the result is output to the screen.

Exercise 5: Write C program to convert a temperature entered from the keyboard in degrees Fahrenheit to degrees Celsius where degC = (degF-32)/1.8 and output the result to the screen.

Exercise 6: Write C program allows a person to enter values for the number of days, hours, minutes and seconds and outputs the total number of seconds to the screen.

Hint: Using long int for variable data type.