Basic C Programming – Q1

Write a C program that reads the user input on temperature in degrees Fahrenheit, and then converts the temperature from degrees Fahrenheit into degrees Celsius. The relevant formula is given as follows: Celsius = (5/9)*(Fahrenheit – 32).

Enter the temperature in degree F:

45

Converted degree in C: 7.222222

Enter the temperature in degree F:

16

Converted degree in C: -8.888889

Basic C Programming – Q1

```
#include <stdio.h>
int main()
{
  float fahrenheit, celsius;

  printf("Enter the temperature in degree F: \n");
  scanf("%f", &fahrenheit);
  celsius = (5.0/9.0)*(fahrenheit - 32);
  printf("Converted degree in C: %f\n", celsius);
 return 0;
}
```

Enter the temperature in degree F:

45

Converted degree in C: 7.222222

Enter the temperature in degree F:

16

Converted degree in C: -8.888889

Note:

- **Take note of integer division.**

Basic C Programming – Q2

Write a C program that computes the solutions for x and y in the linear system of equations:

$$a_1x + b_1y = c_1$$
$$a_2x + b_2y = c_2$$

The solutions for x and y are given by:

$$x = \frac{b_2c_1 - b_1c_2}{a_1b_2 - a_2b_1} \quad \text{and} \quad y = \frac{a_1c_2 - a_2c_1}{a_1b_2 - a_2b_1}$$

Enter the values for a1, b1, c1, a2, b2, c2:

1 1 1 5 7 9

x = -1.000000 and y = 2.000000

Basic C Programming – Q2

```
#include <stdio.h>
#include <math.h>
int main()
{
  float a1,b1,c1,a2,b2,c2;
  float x,y;

  printf("Enter the values for a1, b1, c1, a2, b2, c2: \n");
  scanf("%f %f %f %f %f %f", &a1, &b1, &c1, &a2, &b2, &c2);
  if (fabs(a1*b2 - a2*b1) >=  0.0001)
  {
    x = (b2*c1 - b1*c2) / (a1*b2 - a2*b1);
    y = (a1*c2 - a2*c1) / (a1*b2 - a2*b1);
    printf("x = %f and y = %f\n", x, y);
  }
  else
    printf("Unable to compute - denominator is zero!");
  return 0;
}
```

Note:

- **Take note of floating point value 0, which can be represented as very small value.**

Enter the values for a1, b1, c1, a2, b2, c2:

1 1 1 5 7 9

x = -1.000000 and y = 2.000000

Basic C Programming – Q3, Q4

```
#include <stdio.h>
int main() {
  int numOfStudents;
  int totalMarks, passes, failures, mark, counter;
  double average=0;
  totalMarks = passes = failures = 0;
  printf("Enter the no. of students: \n");
  scanf("%d", &numOfStudents);
  /* Q3: add the following debugging statement to trace the sequence of program execution*/
  printf("Print the numOfStudents : %d\n", numOfStudents);

  for (counter = 1;  counter <= numOfStudents; counter++)  // loop execution
  {
    printf("Enter marks: \n");
    scanf("%d", &mark);
    totalMarks += mark;
    if (mark < 50)
      failures++;
    else
      passes++;
 /* Q3: add the following debugging statement to trace the sequence of program execution*/
    printf("Print Counter = %d\n", counter);
    printf("Print failures = %d; passes = %d\n", failures, passes);
    printf("Print Total marks = %d\n", totalMarks);
  }
  printf("Average mark: %f\n", (double)totalMarks/numOfStudents);
  return 0;
}
```

Q4:

- **Use the debugger to step through the program execution**
- **Setup breakpoint and inspect program variable values**