C++ Assignment Solutions | Fundamentals of Programming -1 | Week2

1. Take 2 integers input and print the greatest of them

Input 1: a = 5 b = 7
Output 1: second number 7 is the largest.
Solution:

```
#include <iostream>

using namespace std;

int main() {
   int num1, num2;
   cout << "Enter first number:";
   cin >> num1;
   cout << "Enter second number:";
   cin >> num2;
   if (num1 > num2) {
      cout << "First number " << num1 << " is the largest";
   } else {
      cout << "Second number " << num2 << " is the largest";
   }
   return 0;
}
```

2. Given the radius of the circle, predict whether numerically the area of this circle is larger than the circumference or not.

Input 1: radius = 4
Output 1: Area is greater than circumference.
Solution:

```
#include <iostream>

using namespace std;

int main() {
```

```
    int radius;
    cout << "Enter the radius : ";
    cin >> radius;

    float area = 3.14 * radius * radius;
    float circumference = 2 * 3.14 * radius;
    if (area > circumference) cout << "Area is greater than circumference." << endl;
    else cout << "Circumference is greater than area." << endl;
    return 0;
}
```

3. Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not. (Considering leap year occurs after every 4 years)

Input 1: 1976
Output: yes
Input 2: 2003
Output: no

```
#include <iostream>

using namespace std;

int main() {
    int year;
    cout << "Enter a year: ";
    cin >> year;

    // leap year if perfectly divisible by 400
    if (year % 400 == 0) {
        cout << year << " is a leap year.";
    }
    // not a leap year if divisible by 100
    // but not divisible by 400
    else if (year % 100 == 0) {
        cout << year << " is not a leap year.";
    }
    // leap year if not divisible by 100
    // but divisible by 4
    else if (year % 4 == 0) {
        cout << year << " is a leap year.";
    }
    // all other years are not leap years
    else {
        cout << year << " is not a leap year.";
    }
```

```
    return 0;
}
```

4. Given the length and breadth of a rectangle, write a program to find whether numerically the area of the rectangle is greater than its perimeter.

Input 1: length = 5 breadth = 7
Output 1: Area is greater than perimeter.
Solution:

```
#include <iostream>

using namespace std;

int main() {
    int length, breadth;
    cout << "Enter the length and breadth of the rectangle respectively : ";
    cin >> length >> breadth;

    int area = length * breadth;
    int perimeter = 2 * (length + breadth);
    if (area > perimeter) cout << "Area is greater than perimeter.";
    else cout << "Perimeter is greater than area.";
    return 0;
}
```

5. Write a program to input sides of a triangle and check whether a triangle is equilateral, scalene or isosceles triangle.

Input : side1 = 5 side2 = 4 side3 = 4
Output: This is an Isosceles triangle.
Solution:

```
#include<iostream>

using namespace std;

int main() {
    int side1, side2, side3;

    cout << "Please Enter Three Sides of a Triangle =  ";
    cin >> side1 >> side2 >> side3;

    if (side1 == side2 && side2 == side3) {
        cout << "This is an Equilateral Triangle";
    } else if (side1 == side2 || side2 == side3 || side1 == side3) {
        cout << "This is an Isosceles Triangle";
```

```
    } else
        cout << "This is a Scalene Triangle";

    return 0;
}
```

6. If the marks of A, B and C are input through the keyboard, write a program to determine the student scoring least marks.

Input 1: A = 23 , B = 34 , C  = 71
Output :  A scores the least marks
Solution:

```
#include <bits/stdc++.h>

using namespace std;

int main() {
    cout << "Enter marks of the students : ";
    int a, b, c;
    cin >> a >> b >> c;

    if (a <= b && a <= c)
        cout << "A scores the least marks";

    else if (b <= a && b <= c)
        cout << "B scores the least marks";

    else
        cout << "C scores the least marks";

    return 0;
}
```

7. Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin, viz. (0, 0).

Input 1: 2 0
Output 1: the point lies on the x - axis.

```
#include<iostream>

using namespace std;

int main() {
    float x, y;
    printf("Enter the x-y coordinates of the point : ");
```

```
    cin >> x >> y;

    if (x == 0 && y == 0)
        cout << "The point is on the origin.";
    if (x == 0 && y != 0)
        cout << "The point lie on the y-axis.";
    if (x != 0 && y == 0)
        cout << "The points lie on the x-axis.";
    if (x != 0 && y != 0)
        cout << "The points lie on the plane.";
    return 0;
}
```

8. Given three points (x1, y1), (x2, y2) and (x3, y3), write a program to check if all the three points fall on one straight line.

Input 1: x1 = 1 , y1 = 2 , x2 = 2 , y2 = 3 , x3 = 3 , y3 = 4

Output 1: All 3 points lie on the same line.

Solution

```
#include <iostream>

using namespace std;
int main() {
    float x1, y1, x2, y2, x3, y3, slope1, slope2;

    cout << "Enter points (x1, y1)" << endl;
    cin >> x1 >> y1;

    cout << "Enter points (x2, y2)" << endl;
    cin >> x2 >> y2;

    cout << "Enter points (x3, y3)" << endl;
    cin >> x3 >> y3;

    slope1 = (y2 - y1) / (x2 - x1);
    slope2 = (y3 - y2) / (x3 - x2);

    if (slope1 == slope2) {
        cout << "All 3 points lie on the same line";
    } else {
        cout << "All 3 points do not lie on the same line";
    }

    return 0;
}
```

9. Write a C++ program to input any character and check whether it is the alphabet, digit or special character.

Input 1: ch = ‘9’
Output 1: digit
Solution:

```
#include<iostream>

using namespace std;

int main() {
   char ch;
   cout << "Enter any character : ";
   cin >> ch;

   // Alphabet checking condition
   if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
      cout << ch << " is an Alphabet";
   } else if (ch >= '0' && ch <= '9') {
      cout << ch << " is a Digit";
   } else {
      cout << ch << " is a Special Character";
   }
   return 0;
}
```

10. Predict the output of below code

```
#include<iostream>

using namespace std;
int main() {
   int a = 500, b, c;
   if (a >= 400)
      b = 300;
   c = 200;
   cout << "value of b and c are respectively " << b << " and " << c;
   return 0;
}
```

Solution:
value of b and c are respectively 300 and 200