Assignment Part 4

36. Write a class "**Point**" which stores coordinates in (x, y) form. Define necessary constructor, destructor and other reader/writer functions. Now overload '-' operator to calculate the distance between two points.

37. Design a class ***Complex*** that includes all the necessary functions and operators like =, +, -, *, /.

38. Implement a class "**Quadratic**" that represents second-degree polynomial i.e. polynomial of type ax^2+bx+c. The class will require three data members corresponding to a, b and c. Implement the following:

    a. A constructor (including a default constructor which create a null polynomial)

    b. Overload the addition operator to add two polynomials of degree 2.

    c. Overload << and >> operators to print and read polynomials.

    d. A function to compute the value of polynomial for a given x.

    e. A function to compute roots of the equation $ax^2+bx+c=0$. Remember, root may be a complex number. You may implement "**Complex**" class to represent root of the quadratic equation.

39. A program is given as follows:

```
class INT {
        int i;
    public :
        INT(int a):i(a){}
        ~INT() {}
};
int main() {
    int x = 3;
    INT y = x;
    y++ = ++y;
    x = y;
    return 0;
}
```

Write extra functions/operators required in the INT class to make main program work. Provide suitable implementation for the added functions/operators.

40. Design and implement class(es) to support the following main program.

```
int main() {
    IntArray i(10);
    for(int k = 0; k < 10; k++)
        i[k] = k;
    cout << i;
    return 0;
}
```

41. You are given a main program:

```
int main() {
      Integer a = 4, b = a, c;
    c = a+b++;
    int i = a;
    cout << a << b << c;
    return 0;
}
```

Design and implement class(es) to support the main program.

42. Design and implement class(es) to support the following code segment.

```
Table t(4, 5), t1(4, 5);
cin >> t;
t[0][0] = 5;
int x = t[2][3];
t1 = t;
cout << t << “\n” << t1;
```

43. Design and implement class(es) to support the following code segment.

```
Index in(4), out(10);
int x = in;
int y = in + out;
in = 2;
Integer i;
i = in;
```