Classes and Objects

1. Define a class Complex to represent a complex number. Declare instance member variables to store real and imaginary part of a complex number, also define instance member functions to set values of complex number and print values of complex number

```
#include <iostream>
using namespace std;
class Complex
{
private:
    int real, img;

public:
    void setValue(int x, int y)
    {
        real = x;
        img = y;
    }
    void getValue()
    {
        cout << real << " + " << img << "i" << endl;
    }
};
int main()
{
    Complex r1, r2;

    r1.setValue(5, 6);
    r2.setValue(8, 10);
    r1.getValue();
    r2.getValue();

    return 0;
}
================================================================================
Output:
5 + 6i
8 + 10i
```

2. Define a class Time to represent Time (like 3 hr 45 min 20 sec). Declare appropriate number of instance member variables and also define instance member functions to set values for time and display values of time.

```
#include <iostream>
using namespace std;
class Time
{
private:
    int hr, min, sec;

public:
    void setTime()
    {
        cout << "Enter time (Hour minute and second) : ";
        cin >> hr >> min >> sec;
    }
    void getTime()
    {
        cout << hr << " hr " << min << " min " << sec << " sec" << endl;
    }
};
int main()
{
```

```
    Time t;

    t.setTime();
    t.getTime();

    return 0;
}
================================================================================
Output:
Enter time (Hour minute and second) : 05 52 28
5 hr 52 min 28 sec
```

3. Define a class Factorial and define an instance member function to find the Factorial of a number using class.

```
#include<iostream>
using namespace std;
class Factorial
{
    private:
        int n, fact = 1;
    public:
        void factorial()
        {
            cout<<"Enter a number to calculate factorial : ";
            cin>>n;
            for (int i = 1; i <= n; i++)
            {
                fact = fact * i;
            }
            cout<<"Factorial is "<<fact;
        }
};

int main()
{
    Factorial f;
    f.factorial();

    return 0;
}
================================================================================
Output:
Enter a number to calculate factorial : 5
Factorial is 120
```

4. Define a class LargestNumber and define an instance member function to find the Largest of three Numbers using the class.

```
#include <iostream>
using namespace std;
class LargestNumber
{
private:
    int a, b, c, result;

public:
    void largestNumber()
    {
        cout << "Enter three numbers : ";
        cin >> a >> b >> c;
        result = a > b ? a : b;
        result = result > c ? result : c;
        cout << "Largest number : " <<  result;
    }
```

```
};

int main()
{
    LargestNumber l;
    l.largestNumber();
    return 0;
}
================================================================================
Output:
Enter three numbers : 26 27 25
Largest number : 27
```

5. Define a class ReverseNumber and define an instance member function to find Reverse of a Number using class.

```
#include <iostream>
using namespace std;
class ReverseNumber
{
private:
    int number, remander, result, r1;

public:
    void reverseNumber()
    {
        cout << "Enter a number : ";
        cin >> number;
        for (int i = 1; number; i++)
        {
            if (i == 1)
            {
                remander = number % 10;
                number = number / 10;
            }
            else
            {
                r1 = number % 10;
                number = number / 10;
                remander = remander * 10;
                remander = remander + r1;
            }
        }
        cout << "Reverse number is " << remander;
    }
};

int main()
{
    ReverseNumber r;
    r.reverseNumber();
    return 0;
}
================================================================================
Output:
Enter a number : 157896
Reverse number is 698751
```

6. Define a class Square to find the square of a number and write a C++ program to Count number of times a function is called.

```
#include <iostream>
using namespace std;
class Square
{
```

```
private:
    int number;

public:
    static int time;
    void square()
    {
        time++;
        cout << "Enter a number :";
        cin >> number;
        cout << "Square of " << number << " is " << number * number << endl;
    }
};
int Square::time = 0;

int main()
{
    Square s;
    s.square();
    s.square();
    s.square();
    cout << Square::time << " times a function is called";
    return 0;
}
```

```
Output:
Enter a number :5
Square of 5 is 25
Enter a number :6
Square of 6 is 36
Enter a number :8
Square of 8 is 64
3 times a function is called
```

7. Define a class Greatest and define instance member function to find Largest among 3 numbers using classes.

```
#include <iostream>
using namespace std;
class Greatest
{
private:
    int a, b, c, result;

public:
    void largestNumber()
    {
        cout << "Enter three numbers : ";
        cin >> a >> b >> c;
        result = a > b ? a : b;
        result = result > c ? result : c;
        cout << "Largest number : " <<  result;
    }
};

int main()
{
    Greatest l;
    l.largestNumber();
    return 0;
}
```

```
Output:
Enter three numbers : 520 568 27
Largest number : 568
```

8. Define a class Rectangle and define an instance member function to find the area of the rectangle.

```
#include <iostream>
using namespace std;
class Rectangle
{
private:
    int length, breadth;

public:
    void areaRectangle()
    {
        cout << "Enter length and breadth of a rectangle : ";
        cin >> length >> breadth;
         cout << "Area of a rectangle is " << length * breadth << " unit" <<
endl;
    }
};

int main()
{
    Rectangle a1, a2;
    a1.areaRectangle();
    a2.areaRectangle();
    return 0;
}
================================================================================
Output:
Enter length and breadth of a rectangle : 5 7
Area of a rectangle is 35 unit
Enter length and breadth of a rectangle : 54 60
Area of a rectangle is 3240 unit
```

9. Define a class Circle and define an instance member function to find the area of the circle.

```
#include <iostream>
using namespace std;
class Circle
{
private:
    float r;

public:
    void areaCircle()
    {
        cout << "Enter radius of a circle : ";
        cin >> r;
        cout << "Area of a circle is " << 3.14159 * r * r << " unit" << endl;
    }
};

int main()
{
    Circle a1;
    a1.areaCircle();

    return 0;
}
================================================================================
Output:
Enter radius of a circle : 25
Area of a circle is 1963.49 unit
```

10. Define a class Area and define instance member functions to find the area of the different shapes like square, rectangle , circle etc.

```
#include <iostream>
using namespace std;
class Area
{
private:
    float length, breadth, radius;

public:
    void areaSquare()
    {
        cout << "Enter length of square : ";
        cin >> length;
        cout << "Area of square is " << length * length << endl;
    }
    void areaCircle()
    {
        cout << "Enter radius of a circle : ";
        cin >> radius;
          cout << "Area of a circle is " << 3.14159 * radius * radius << "
unit" << endl;
    }
    void areaRectangle()
    {
        cout << "Enter length and breadth of a rectangle : ";
        cin >> length >> breadth;
         cout << "Area of a rectangle is " << length * breadth << " unit" <<
endl;
    }
};

int main()
{
    Area s;
    s.areaCircle();
    s.areaSquare();
    s.areaRectangle();
    return 0;
}

================================================================================
Output:
Enter radius of a circle : 25
Area of a circle is 1963.49 unit
Enter length of square : 22.35
Area of square is 499.523
Enter length and breadth of a rectangle : 26.32 36.45
Area of a rectangle is 959.364 unit
```