Assignment - 25
A Job Ready Bootcamp in C++, DSA and IOT MySirG
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

Program -

```
#include<iostream>
using namespace std;

class Complex
{
    private:
        int real;
        int img;

    public:
        void setValues(int x, int y)
        {
            real = x;
            img = y;
        }

        void displayValues()
        {
            cout<<"Complex number:-\n";
            cout<<real<<" + "<<img<<"i"<<endl;
        }
};

int main()
{
    Complex c1;

    c1.setValues(4,5);
    c1.displayValues();
    return 0;
}
```

Output -

Complex number:-
4+5i

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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.

Program -

```
#include<iostream>
using namespace std;

class Time
{
    private:
        int hours;
        int minutes;
        int seconds;

    public:
        void setTime(int h, int min, int sec)
        {
            hours = h;
            minutes = min;
            seconds = sec;
        }

        void displayTime()
        {
            cout<<"Time:- "<<endl;
            cout<<hours<<":"<<minutes<<":"<<seconds<<endl;
        }
};

int main()
{
    Time t;
    t.setTime(9,45,17);
    t.displayTime();
    return 0;
}
```

Output -

Time:-
9:45:17

---

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

Program -

```
#include<iostream>
using namespace std;
```

```
class Factorial
{
    public:
        int fact(int num)
        {
            int f = 1;
            while(num)
            {
                f *= num;
                num--;
            }
            return f;
        }
};
int main()
{
    Factorial f;
    int n;
    cout<<"Enter a number: ";
    cin>>n;
    cout<<"Factorial of "<<n<<": "<<f.fact(n)<<endl;
    return 0;
}
```

Output -
Enter a number: 5
Factorial of 5: 120

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

Program -

```
#include<iostream>
using namespace std;

class LargestNumber
{
    public:
        int findLargest(int num1, int num2, int num3)
        {
            int largest;

            if(num1 == num2)
            {
                if(num1 < num3)
                    largest = num3;

                else if(num1 >= num3)
                    largest = num1;
            }
```

```
            else if(num1 > num2)
            {
                if(num1 > num3)
                    largest = num1;

                else if(num1 == num3)
                    largest = num1;
                else
                    largest = num3;
            }
            else
            {
                if(num2 > num3)
                    largest = num2;
                else
                    largest = num3;
            }

            return largest;
        }
};
int main()
{
    LargestNumber obj;
    int a, b, c;
    cout<<"Enter three values: ";
    cin>>a>>b>>c;

    cout<<"Largest number is: "<<obj.findLargest(a,b,c);
    return 0;
}
```

Output -
Enter three values: 16 2 9
Largest number is: 16

---

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

Program -

```
#include<iostream>
using namespace std;

class ReverseNumber
{
    public:
        int reverseNum(int num)
        {
            int digit, rev = 0;
```

```
            while(num)
            {
                digit = num % 10;
                num = num / 10;
                rev = rev * 10 + digit;
            }
            return rev;
        }
};

int main()
{
    ReverseNumber obj;
    int n;
    cout<<"Enter a number: ";
    cin>>n;

    cout<<"Reverse of "<<n<<" is: "<<obj.reverseNum(n)<<endl;
    return 0;
}
```

Output -
Enter a number: 453
Reverse of 453 is: 354

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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.

Program -

```
#include<iostream>
using namespace std;

class Square
{
    public:
        void doSquare(int n)
        {
            static int c = 0;
            c++;
            cout<<"Square of "<<n<<" is: "<<n*n<<endl;
            cout<<"Number of times function is called: "<<c<<endl;
        }

};

int main()
{
    Square obj;
    obj.doSquare(4);
    obj.doSquare(5);
```

```
    obj.doSquare(9);
    return 0;
}
```

Output -
Square of 4 is: 16
Number of times function is called: 1
Square of 5 is: 25
Number of times function is called: 2
Square of 9 is: 81
Number of times function is called: 3

---

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

Program -

```
#include<iostream>
using namespace std;

class Greatest
{
    public:
        int findGreatest(int num1, int num2, int num3)
        {
            int greatest;

            if(num1 == num2)
            {
                if(num1 < num3)
                    greatest = num3;

                else if(num1 >= num3)
                    greatest = num1;
            }
            else if(num1 > num2)
            {
                if(num1 > num3)
                    greatest = num1;

                else if(num1 == num3)
                    greatest = num1;
                else
                    greatest = num3;
            }
            else
            {
                if(num2 > num3)
                    greatest = num2;
                else
                    greatest = num3;
```

```
            }

            return greatest;
        }
};
int main()
{
    Greatest obj;
    int a, b, c;
    cout<<"Enter three values: ";
    cin>>a>>b>>c;

    cout<<"Greatest number is: "<<obj.findGreatest(a,b,c)<<endl;
    return 0;
}
```

Output -
Enter three values: 0 9 1
Greatest number is: 9

---

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

Program -

```
#include<iostream>
using namespace std;

class Rectangle
{
    public:
        int area(int l, int b)
        {
            return l*b;
        }
};
int main()
{
    Rectangle obj;
    int l, b;

    cout<<"Enter length and breadth of rectangle: ";
    cin>>l>>b;

    cout<<"Area of rectangle is: "<<obj.area(l,b)<<endl;
    return 0;
}
```

Output -
Enter length and breadth of rectangle: 7 2
Area of rectangle is: 14

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

Program -

```
#include<iostream>
using namespace std;

class Circle
{
    public:
        float area(int r)
        {
            return 3.14*r*r;
        }
};
int main()
{
    Circle obj;
    int r;
    float area;

    cout<<"Enter the radius of circle: ";
    cin>>r;
    area = obj.area(r);
    cout<<"Area of circle is: "<<area<<endl;
    return 0;
}
```

Output -

Enter the radius of circle: 5
Area of circle is: 78.5

---

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

Program -

```
#include<iostream>
using namespace std;

class Area
{
    public:
        int area(int s)
        {
            return s*s;
        }
        int area(int l, int b)
        {
            return l*b;
        }
```

```
        float area(float r)
        {
            return 3.14*r*r;
        }
};

int main()
{
    Area a1, a2, a3;
    int l, b;
    float r;

    cout<<"Enter length of square: ";
    cin>>l;
    cout<<"Area of square is: "<<a1.area(l)<<endl;

    cout<<"Enter length and breadth of rectangle: ";
    cin>>l>>b;
    cout<<"Area of rectangle is: "<<a2.area(l,b)<<endl;

    cout<<"Enter radius of circle: ";
    cin>>r;
    cout<<"Area of circle is: "<<a3.area(r)<<endl;
    return 0;
}
```

Output -

Enter length of square: 5
Area of square is: 25
Enter length and breadth of rectangle: 5 9
Area of rectangle is: 45
Enter radius of circle: 9
Area of circle is: 254.34
