

Heaven's Light is Our Guide  
Rajshahi University of Engineering & Technology  
Department of Computer Science & Engineering

## **Lab Manual**

Course Code: **CSE 1204 (Sec A)**  
Course Title: Sessional based on CSE 1203  
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## Module 4 [polymorphism]: (for Week 5)

### Topic 1[Method/Function Overloading]

*Problem Statement:* Define a class Test where overload a method Sum() to sum numbers sent from main() function.

```
class Test{

    public:
        //overload Sum() method according to the requirement of main()
};

int main(){
    Test t;
    t.Sum(10); //returns 10
    t.Sum(10,20) //return 30
    t.Sum(5.7,20) //return 25.7
    t.Sum(10,2.6) //return 12.6
    t.Sum(10.5,20.7) //return 21.2
}
```

**Topic 2 [Operator Overloading]:** Suppose in a AC circuit, there are 3 impedances  $z_1=3+j4$ ,  $z_2=4-j3$  and  $z_3=j6$  are connected in parallel. Now find the current in the circuit if input voltage is  $100+j50$ . Implement **operator overloading** concept for your calculation. Use class **Circuit** and initialize the impedance values (real & img) by a constructor.

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```
class Circuit{
private:
    int real;
    int img;
public:
    //write constructor
    //write operator overloaded method
    //write a display method to display real and img
};

int main(){
    Circuit z1(3,4);
    //write required statements to find the current
}
```

### Topic 3[Method/Function Overriding]

Problem statement: Write a class A with a method **Print()** and a derived class B with method **Print()** overloaded. Now observe the output when following statements are written in the **main()** function-

<pre>class A{     public:         void Print(){             cout&lt;&lt;"Inside Print() of class A"&lt;&lt;endl;         } };  class B:public A{     public:         void Print(){             cout&lt;&lt;"Inside Print() of class B"&lt;&lt;endl;         } };</pre>	<p>Write Statements inside main()</p> <pre>i)    A a;       a.Print(); ii)   B b;       b.Print(); iii)  A a;       A *p;       p=&amp;a;       p-&gt;Print(); iv)   B b;       A *p;       p=&amp;b;       p-&gt;Print();</pre> <p>Repeat i)-iv) after writing virtual in front of void Print()</p>
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### Topic 4[Pure Virtual Function]

Problem statement: Modify the class defined in Topic 3 executes the following statements i)-iv) and observe the output:

<pre>class A{     public:         virtual void Print()=0;     } };  class B:public A{     public:         void Print(){             cout&lt;&lt;"Inside Print() of class B"&lt;&lt;endl;         } };</pre>	<p>Write Statements inside main()</p> <pre>iii)  A a;       a.Print(); iv)   B b;       b.Print(); iii)  A a;       A *p;       p=&amp;a;       p-&gt;Print(); iv)   B b;       A *p;       p=&amp;b;       p-&gt;Print();</pre>
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## Topic 5 [Friend Function]

*Problem Statement:* Using the following class, write three friend functions

- i) Add() : Assign value to the data member x
- ii) IncX() : Increase the value of x by m
- iii) DecX() : Decrease the value of x by n

```
class A{
private:
    int x;
public:
    //Prototype of friend functions
};

//write body of friend functions

int main(){
    //call these methods
}
```