

Assignment 13

Laboratory 8

Virtual Function, Virtual Destructor & Abstract Class

Example 1 Function Overloading

```
#include<iostream>
using namespace std;
int add(int a,int b){ return a+b;}
double add(double a,double b){ return a+b;}
int main(){
    int x=add(3,4);
    double y=add(4.6,7.8);
}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ cd examples/
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ g++ 1A.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ ./1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$
```

Function Overriding

```
#include<iostream>
using namespace std;
class A{ public: void show(){ cout<<"I am base"<<endl; }};
class B:public A{
    public: void show(){ cout<<"I am derived"<<endl; }};
int main(){ A a; a.show(); B b; b.show();}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ g++ 1B.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ ./1
I am base
I am derived
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$
```

Example 2

```
#include<iostream>
using namespace std;
class A{
    public: virtual void show(){ cout<<"I am A"<<endl; }};
class B:public A{
    public: void show(){ cout<<"I am B"<<endl; }};
class C:public A{
    public: void show(){ cout<<"I am C"<<endl; }};
int main(){
    A *ptr;A a;B b;C c; ptr=&a; ptr->show(); ptr=&b;
    ptr->show(); ptr=&c; ptr->show();
}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ g++ 2.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ ./1
I am A
I am B
I am C
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ █
```

Example 3

```
#include<iostream>
using namespace std;
class B{ public:
    B(){ cout<<"Base created"<<endl; }
    virtual ~B(){ cout<<"Base Destructured"<<endl; }
};
class A:public B{
    public: A(){ cout<<"Derived created"<<endl; }
    virtual ~A(){ cout<<"Derived Destructured"<<endl; };
int main(){ B*ptr=new A(); ptr->~B(); }
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ g++ 3.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ ./1
Base created
Derived created
Derived Destructured
Base Destructured
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/examples$ █
```

Program 1)

```
#include<iostream>
using namespace std;
class A { public: int x, y, s; int num;
    void get() { cout << "Enter any numbers:"; cin >>num; };
```

```
class B : public A {public: void input1() {
    cout << "Enter number 1:"; cin >>x; };
```

```
class C : public B {public:
void input2() { cout << "Enter number 2:"; cin >>y; };
```

```
class D : public C {public:
    void add() { s=x+y; cout<< "Sum is:" << s<<endl; };
```

```
int main() {
    D d; d.input1(); d.input2(); d.add();
}
```

```
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ g++ 1.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ ./1
Enter number 1:1
Enter number 2:2
Sum is:3
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ █
```

Program 2)

```

#include <iostream>
using namespace std;
class Shape {
protected:    double x, y,z;    public:
    void set_dim(double i, double j=0,double k=0) {
        x = i;        y = j;        z=k;
    }
    virtual void show_cube(void) {
        cout << "No cube computation defined ";
        cout << "for this class.\n";
    }
};

class square : public Shape {
public:        void show_cube(void) {
    cout << "Square with dimensions ";
    cout << x << "x" << y<<"x"<<z;
    cout << " has an cube of ";
    cout << x * y *z<< ".\n";
}
};

class circle : public Shape {
public:        void show_cube(void) {
    cout << "Circle with radius "; cout << x;
    cout << " has an cube of ";
    cout <<1.3* 3.14 * x * x*x<<endl;
}
};

int main() {
    Shape *p; square s; circle c; p = &s; p->set_dim(10.0, 10.0,10.0);
p->show_cube();    p = &c;    p->set_dim(9.0);    p->show_cube();
}

```

```

shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ g++ 2.cpp -o 1
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ ./1
Square with dimensions 10x10x10 has an cube of 1000.
Circle with radius 9 has an cube of 2975.78
shyam@shyam-HP-Laptop-15-da0xxx:~/Desktop/oopLAB/laboratory8/question$ █

```