OOP (Object Oriented Programming) Lab

LAB REPORT # 8

Semester: 2nd Semester

Section: C

Submitted To:

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Submitted By:

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Code:

```cpp
// without virtual Function

#include <iostream>

using namespace std;

class Add
{
    int x = 5, y = 20;

public:
    void display() // overridden function
    {
        cout << "Value of x is : " << x + y << endl;
    }
};

class Subtract : public Add
{
    int y = 10, z = 30;

public:
    void display() // overridden function
    {
        cout << "Value of y is : " << y - z << endl;
    }
};

int main()
{
    Add *m;      // base class pointer .it can only access the base class members
    Subtract s; // making object of derived class
    m = &s;
    m->display(); // Accessing the function by using base class pointer

    return 0;
}
```

Output:

```
Value of x is : 25
```

Code:

```
#include <iostream>
using namespace std;
class Add
{
public:
    virtual void print()
    {
        int a = 20, b = 30;
        cout << " base class Action is:" << a + b << endl;
    }
    void show()
    {
        cout << "show base class" << endl;
    }
};
class Sub : public Add
{
public:
    void print() // print () is already virtual function in derived class, we could also
declared as virtual void print() explicitly
    {
        int x = 20, y = 10;
        cout << " derived class Action:" << x - y << endl;
    }
    void show()
    {
        cout << "show derived class" << endl;
    }
};
// main function
int main()
{
    Add *aptr;
    Sub s;
    aptr = &s;
    // virtual function, binded at runtime (Runtime polymorphism)
    aptr->print();
    // Non-virtual function, binded at compile time

    aptr->show();
    return 0;
}
```

Output:

```
 derived class Action:10
show base class
```

Code:

```cpp
#include <iostream>

using namespace std;

class Animal
{
public:
    virtual void show() = 0; // Pure virtual function declaration.
};
class Man : public Animal
{
public:
    void show()
    {
        cout << "Man is the part of animal husbandry " << endl;
    }
};

int main()
{
    Animal *aptr; // Base class pointer
    // Animal a;
    Man m; // derived class object creation.
    aptr = &m;
    aptr->show();

    return 0;
}
```

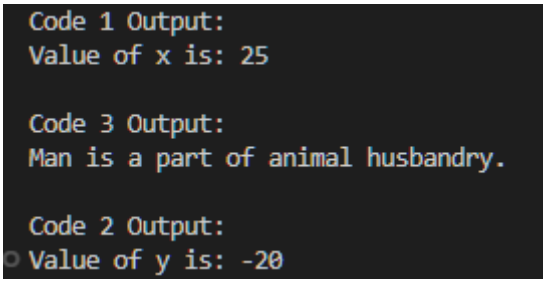
Output:

```
Man is the part of animal husbandry
```

Code:

```cpp
#include <iostream>

using namespace std;

class Add
{
protected:
    int x = 5, y = 20;

public:
    virtual void display(){
        cout << "Value of x is: " << x + y << endl;
    }
};
class Subtract : public Add{
private:
    int y = 10, z = 30;

public:
    void display(){
        cout << "Value of y is: " << y - z << endl;
    }
};
class Animal{
public:
    virtual void show() = 0; // Pure virtual function declaration.
};
class Man : public Animal{
public:
    void show(){
        cout << "Man is a part of animal husbandry." << endl;
    }
};

int main(){
    Add addObj;
    cout << "Code 1 Output:" << endl;
    addObj.display();

    Animal *animalPtr;
    Man manObj;
    animalPtr = &manObj;
    cout << "\nCode 3 Output:" << endl;
    animalPtr->show();

    cout << "\nCode 2 Output:" << endl;
    Add *addPtr;
    Subtract subtractObj;
    addPtr = &subtractObj;
    addPtr->display();

    return 0;
}
```

Output:


Code 1 Output:
Value of x is: 25
Code 3 Output:
Man is a part of animal husbandry.
Code 2 Output:
Value of y is: -20