

DHAKA UNIVERSITY OF ENGINEERING & TECHNOLOGY, GAZIPUR



Department of Computer Science and Engineering

Course No.: **CSE-2112**

Course Title: **Object Oriented Programming Language Sessional**

Lab No: 07

Lab Name: Virtual Base Class, Virtual Function

Experiment Date: **25-05-2021**

Submission Date: **28-05-2021**

Submitted To:

Mr.Md. Omor Farque

Associative Professor, Department of CSE

Mss. Sabah Binte Noor

Associative Professor, Department of CSE

Submitted By-

Name: **Mehedi Hasan Shuvo**

Student Id.: 194016

Year: 2nd

Semester: 1st

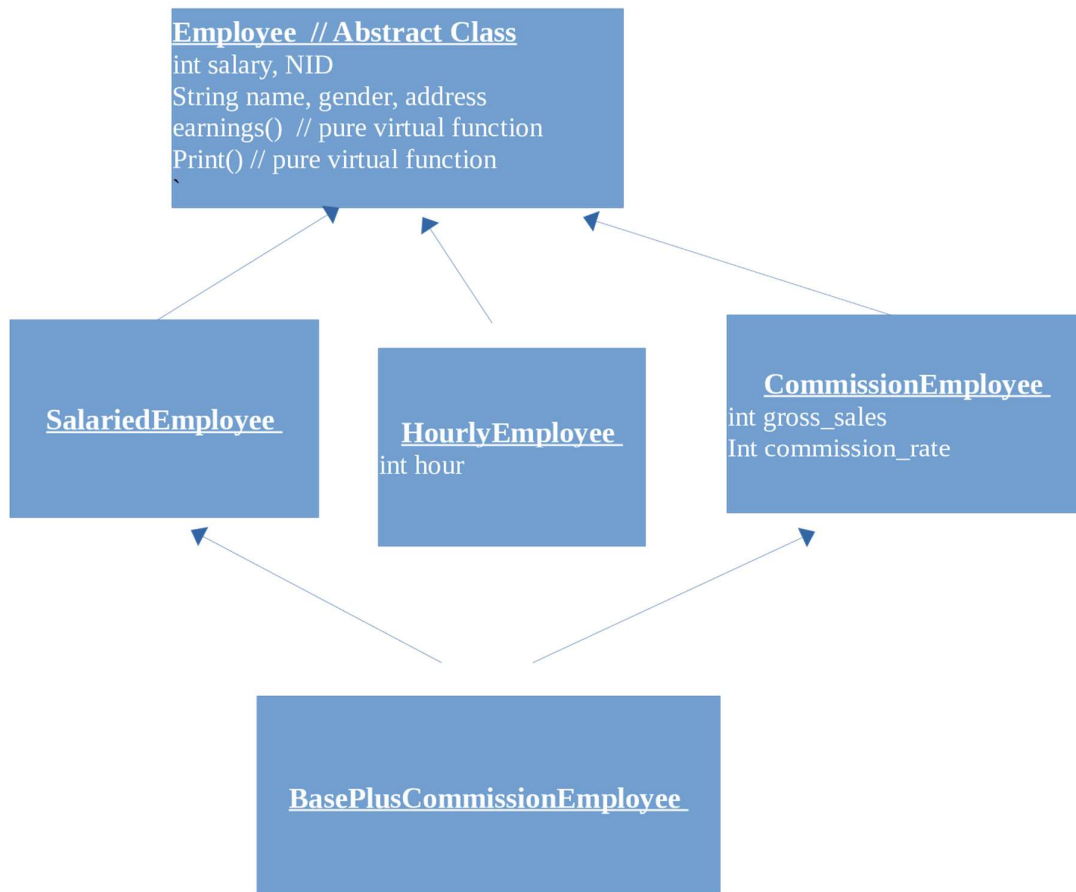
Session: 2019 - 2020

Problems No: 01

Problem Title:

Inheritance: Virtual Base Class, Virtual Function

Consider, the following diagram and implement it in C++. Use pointer of Base class to access the virtual functions of different derived classes.



Solution:

```
#include <bits/stdc++.h>
using namespace std;

class Employee
{
    int salary;
    int nid;
    string name;
    string gender;
    string address;

public:
    Employee(int salary, int nid, string name, string gender, string address)
    {
        this->salary = salary;
        this->nid = nid;
        this->name = name;
        this->gender = gender;
        this->address = address;
    };

    int getSalary() { return salary; }
    int getNid() { return nid; }
    string getName() { return name; }
    string getGender() { return gender; }
    string getAddress() { return address; }

    // create a virtual function
    virtual int print() = 0;
    virtual int earning() = 0;
};

class SalariedEmployee : virtual public Employee
// inherit Employee class as virtual base class
{
public:
    SalariedEmployee(int salary, int nid, string name, string gender,
        string address) : Employee(salary, nid, name, gender, address) {}
};
```

```

int print()
{
    cout << "Name: " << getName() << endl;
    cout << "Gender: " << getGender() << endl;
    cout << "Nid: " << getNid() << endl;
    cout << "Salary: " << getSalary() << endl;
    cout << "Address: " << getAddress() << endl;
    return 0;
}

int earning()
{
    cout << "Salary Is : " << getSalary() << endl
        << endl;
    return 1;
}
};

class HourlyEmployee : virtual public Employee
// inherit Employee class as virtual base class
{
    int hour;

public:
    HourlyEmployee(int salary, int hour, int nid, string name, string gender, string address) :
        Employee(salary, nid, name, gender, address)
    {
        this->hour = hour;
    }

    int print()
    {
        cout << "Name: " << getName() << endl;
        cout << "Gender: " << getGender() << endl;
        cout << "Nid: " << getNid() << endl;
        cout << "Salary: " << getSalary() * hour << endl;
        cout << "Address: " << getAddress() << endl;
        return 0;
    }

    int earning()
    {
        cout << "Salary Is : " << getSalary() * hour << endl
            << endl;
        return 1;
    }
};

```

```

class CommisionEmployee : virtual public Employee
    // inherit Employee class as virtual base class
{
    int grossSales;
    int commisionRate;

public:
    CommisionEmployee(int salary, int grossSales, int commisionRate, int nid, string name,
        string gender, string address) : Employee(salary, nid, name, gender, address)
    {
        this->grossSales = grossSales;
        this->commisionRate = commisionRate;
    }

    int getgrossSales() { return grossSales; }
    int getcommisionRate() { return commisionRate; }

    int print()
    {
        cout << "Name: " << getName() << endl;
        cout << "Gender: " << getGender() << endl;
        cout << "Nid: " << getNid() << endl;
        cout << "Commision: " << (grossSales * commisionRate) << endl;
        cout << "Address: " << getAddress() << endl;
        return 0;
    }
    int earning()
    {
        cout << "Earning Commision Is : " << grossSales * commisionRate << endl
            << endl;
        return 1;
    }
};

class BasPlusCommisionEmployee : public CommisionEmployee, public SalariedEmployee
{

public:
    BasPlusCommisionEmployee(int salary, int grossSales, int commisionRate, int nid,
        string name, string gender, string address) :
        CommisionEmployee(salary, grossSales, commisionRate, nid, name, gender, address),
        Employee(salary, nid, name, gender, address),
        SalariedEmployee(salary, nid, name, gender, address) {}

```

```

int print()
{
    cout << "Name: " << getName() << endl;
    cout << "Gender: " << getGender() << endl;
    cout << "Nid: " << getNid() << endl;
    cout << "Salary: " << getSalary() + (getgrossSales() * getcommisionRate()) << endl;
    cout << "Address: " << getAddress() << endl;
    return 0;
}

int earning()
{
    cout << "Salary Is : " << getSalary() + (getgrossSales() * getcommisionRate()) << endl
        << endl;
    return 1;
}
};

int main()
{
    SalariedEmployee salariedEmployee(200, 12322, "Mehedi Hasan Shuvo", "Male", "Kalkini, Madaripur");
    HourlyEmployee hourlyEmployee(200, 2, 23232, "Md. Mamun", "Male", "Borguna, Barisal");
    CommisionEmployee commisionEmployee(200, 10, 5, 54543333, "Md Nazmul Islam", "Male", "Pabna, Rajshahi");
    BasPlusCommissionEmployee basePlusCommisionEmployee(200, 10, 5, 54543333, "Md. Yaunus", "Male", "Chottogram");

    cout << "=====  

    Employee *e;  

    e = &salariedEmployee;  

    e->earning();  

    e->print();

    cout << endl << "=====  

    e = &hourlyEmployee;  

    e->earning();  

    e->print();

```

```
cout << endl<< "===== ***** Commision Based Employee Information ***** =====" << endl << endl;
e = &commisionEmployee;
e->earning();
e->print();

cout << endl<< "===== ***** Base Plus Commision Based Employee Information ***** =====" << endl<< endl;
e = &basePlusCommisionEmployee;
e->earning();
e->print();

cout << endl;

return 0;
}
```

Output:

```
===== ***** Salaried Based Employee Information ***** =====
Salary Is : 200
Name: Mehedi Hasan Shuvo
Gender: Male
Nid: 12322
Salary: 200
Address: Kalkini, Madaripur

===== ***** Hourly Based Employee Information ***** =====
Salary Is : 400
Name: Md. Mamun
Gender: Male
Nid: 23232
Salary: 400
Address: Borguna, Barisal

===== ***** Commision Based Employee Information ***** =====
Earning Commision Is : 50
Name: Md Nazmul Islam
Gender: Male
Nid: 54543333
Commision: 50
Address: Pabna, Rajshahi

===== ***** Base Plus Commision Based Employee Information ***** =====
Salary Is : 250
Name: Md. Yaunus
Gender: Male
Nid: 54543333
Salary: 250
Address: Chottogram
```

Thanks