# VIT - Vellore

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## BCSE102P_Structured and Object Oriented Programming Lab_VL2024250502365

### VIT V_Structured and OOP_Lab 7_COD_Medium_Virtual Functions

Attempt : 1
Total Mark : 10
Marks Obtained : 10

### Section 1 : Coding

1. Problem Statement

Create a program that manages student information and grades for two types of students: Undergraduate (U) and Graduate (G). The program allows users to input a student's name, roll number, and type ('U' for Undergraduate or 'G' for Graduate). Depending on the type, the program calculates and displays the total grade for the student.

Classes and Virtual Functions: Student (Base Class)

Virtual Functions

virtual void inputGrades(): Handles grade input.

virtual void calculateGrade(): Calculates and displays the total grade.

UndergraduateStudent (Derived Class):

Inherits from Student.

Overrides virtual functions for grade input and grade calculation for Undergraduate students.

GraduateStudent (Derived Class):

Inherits from Student.

Overrides virtual functions for grade input and grade calculation for Graduate students.

***Answer***

```
// You are using GCC
#include<iostream>
using namespace std;

class Student{
   public:
      string name;
      string rollno;
      Student(string a,string b){
         name=a;
         rollno=b;
      }
      virtual void inputGrades(){}
      virtual void calculateGrade(){}
};

class UndergraduateStudent: public Student{
   public:
      using Student:: Student;
      int midterm;
      int final;
      void inputGrades(int x, int y) {
         midterm=x;
         final=y;
      }
      void calculateGrade() {
         cout<<"Name: "<<name<<endl;
```

```
        cout<<"Roll Number: "<<rollno<<endl;
        cout<<"Total Grade: "<<(midterm+final)/2<<endl;
    }
};

class GraduateStudent: public Student{
  public:
    using Student:: Student;
    int research;
    int presentation;
    void inputGrades(int x, int y) {
      research=x;
      presentation=y;
    }
      void calculateGrade() {
      cout<<"Name: "<<name<<endl;
      cout<<"Roll Number: "<<rollno<<endl;
      cout<<"Total Grade: "<<(research+presentation)/2<<endl;
    }
};

int main(){
  string s1;
  string s2;
  char ch;
  int x;
  int y;
  cin>>s1;
  cin>>s2;
  cin>>ch;
  if(ch=='U'){
    cin>>x;
    cin>>y;
    UndergraduateStudent obj(s1,s2);
    obj.inputGrades(x,y);
    obj.calculateGrade();
  }
  else{
    cin>>x;
    cin>>y;
    GraduateStudent obj(s1,s2);
    obj.inputGrades(x,y);
```

```
        obj.calculateGrade();
    }
    return 0;
}
```

***Status :*** Correct **Marks : 10/10**