24csu350

Assingment:-03

Inheritance and Relationship

#include <iostream>

#include <vector>

using namespace std;

// Base class

class Person {

protected:

string name;

int age;

public:

Person(string n, int a) : name(n), age(a) {}

virtual void displayDetails() {

cout << "Name: " << name << ", Age: " << age << endl; }

virtual double calculatePayment() { return 0.0; } };

// Student and subclasses

class Student : public Person {

public:

Student(string n, int a) : Person(n, a) {}

void displayDetails() override {

cout << "Student - "; Person::displayDetails(); }

};class UndergraduateStudent : public Student {

string major;

public:

UndergraduateStudent(string n, int a, string m) : Student(n, a), major(m) {} void displayDetails() override {

Student::displayDetails();

cout << "Major: " << major << endl;

}

};

// Professor and subclasses

class Professor : public Person {

protected:

int yearsOfService;

public:

Professor(string n, int a, int y) : Person(n, a), yearsOfService(y) {} };

class AssistantProfessor : public Professor {

public:

AssistantProfessor(string n, int a, int y) : Professor(n, a, y) {} double calculatePayment() override {

return 40000 + 1000 \* yearsOfService;

}

void displayDetails() override {

cout << "Assistant Professor - "; Person::displayDetails(); }

};

// Aggregation: Course has 1 Professor class Course {string title;

Professor\* instructor;

public:

Course(string t, Professor\* p) : title(t), instructor(p) {}

void showCourseInfo() {

cout << "Course: " << title << endl;

instructor->displayDetails();

}

};

int main() {

UndergraduateStudent u("Alice", 20, "Computer Science"); AssistantProfessor p("Dr. Bob", 45, 5);

Course c("Intro to C++", &p);

u.displayDetails();

cout << endl;

c.showCourseInfo();

cout << "Professor Salary: " << p.calculatePayment() << endl; return 0;