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National	University of Comput	er and Emerging Sc	iences (Lahore)
Course:	ООР	Course code:	CS217
Section:	BSCS-2B	Semester:	Spring 2024
Duration:	40 minutes	TotalMarks:	10
Date:	6 5 24	ID:	Α
Name:	Haleemah	Roll no:	1230554

## Question 1:

NOTE: Read the entire question first before attempting.

A construction company requires a paycheque management system. It employs different types of employees who are all paid differently as described below. All types of employees must have a function that calculates their salaries but an employee can only be one of three types; manager, engineer or salesperson. All employees "must" belong to at least one of these categories. An unclassified employee "cannot be paid a salary".

- 1. All Employees have the following attributes common:
  - name (string): The name of the employee.
  - id (int): The unique ID of the employee.
  - baseSalary (double):
- 2. Implement three derived classes: Manager, Engineer, and Salesperson, each inheriting from the Employee class with unique attributes:
  - For Manager: department (string), bonus (double), calculateSalary()
     method. They are paid a bonus in addition to their base salary.
  - For Engineer: rate (double), numProjects (int), calculateSalary()
    method. They are paid the product of their rate and no. of projects in addition to
    their base salary.
  - For Salesperson: salesAchieved (double), commissionRate (double), calculateSalary() method. They are paid a commission on each sale made in addition to base salary.
- Implement default and parameterised constructors, destructors and a calculateSalary() method in each derived class to calculate the salary of the respective employee type based on the provided attributes.
- 4. Give output of the main given on the next page.

```
int main() {
    // Create employee objects
    vector<Employee*> employees;
    employees.push_back(new Manager("Razan Usman", 100, 1000, "CS", 2000.0));
    employees.push_back(new Engineer("Armaghan Atiq", 420, 1000, 10.0, 5));
    employees.push_back(new Salesperson("Abdullah Ijaz", 666, 1000, 10, 10));
    // Calculate and display salaries
    for (Employee* e : employees) {
        cout << "Name: " << e->name << endl;</pre>
        cout << "ID: " << e->id << endl;
        cout << "Base Salary: $" << e->baseSalary << endl;
        cout << "Total Salary: $" << e->calculateSalary() <<endl;</pre>
        cout << endl;
    // Free memory
    for (Employee* e : employees)
        delete employee;
    return 0;
Output:
Name: Razan Usman
ID: 100
Base Salary: $ 1000
Total Salary: $ 3000
Name: Armaghan Atiq
ID: 420
Base Salary: $ 1000
Total Salary: $ 50'000 1050
Name: Abdullah Ijaz
ID: 666
Base Salary: $ 1000
Total Salary: $2000
```

## ~ Salesperson () { cout << " perstructor called for Salesperson"} };

class Employees  [ public:  String name;  int ID;  Adouble baseSalary; Hard Adouble baseSalary;  Int ID:0;  double baseSalary=1000;  [ Employees ( string name, int ID, double baseSalary)  [ Int ID=Id; Id=ID;  baseSalary=baseSalary;  [ Cout <= "Destructor For Employees()"creen  ]	Haleemah Zaheer	6
public:  string name;  int ID;  clouble base Salary;  Employees () =  { string name = n;  int ID:0;  double base Salary = 1000;  }  Employees ( string name, int ID, double basesalary)  { name = n; n = name;  ID=Id; Id = ID;  base Salary = base Salary;  }  cout <= "Destructor For Employees()" = cout <= "Destructor For Employees()		7
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	5100 900	
	private:	
A	string department;	
	public: Public: Virtual double Calculate Salary ();	
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	Manager (): call parent constructor here	
	10=0; name=n;	
	department = "None";	***
	bonus = 0.00;	
	3	-
	Manager (int by string dpt,)  int id, string n	
	b= bonus; id=ID;	12.
	dpt= department; n=name;	
		et al.
	Manager ()	
	cout <= "Destructor called for Manager";	
	come vestracror carra tos manager;	7
	}	
	double Calculate Salary ()	
*****	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	
	double Salary;	
	Salary = baseSalary + bonus;	
	return Salary;	
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	private:	estavira .	
	double rate; orde		
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	name ="n";	& b=baseSalary; call	ner
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	num Projects = D;	rate = this. rate;	100
	5	numprojects = numprojects;	
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		y + (rate * num Projects);	
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	class Salesperson: public Employees	
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	public: pill prolatotabiles - olduste	
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	commission Rate = 0.00;	
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	Salesperson (int id, string ng double by	
	double sales, double rate)	
	See leto and a profit	
	I <del>D= id;</del> id= ID;	
	13/2 na name; old warsangod - 19ldigh	
	b= base Salary;	
	Sales = sale, Achieved; Manda sides	
	: (2150 join man rate = ) commission Rate; 110002	
to no security	Eprolo Salory	
	double calculate Salary ()	
	3 double Salary;	
	Salary = base Salary + (sales Achieved *	
	commission Rate);	
	return Salary;	
	7	
	~ Salesperson ()	le le
	3. cont << " De structor called for Salesperson"	
	7.	
	5,	

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