**FINAL TEST**

**LAB 10**

**PROGRAMMING FUNDAMENTALS**

**Problem 1: Inheritance (5 points)**

A company wants to manage a lot of employees, including: ID, Name, Birthday, and Salary of the latest month. But the company has 3 kinds of employees with 3 different ways to calculate their salary. Given 3 formulas as following:

* For Secretary employees: Salary = 3000000 + Bonus – DaysOff\*100
* For Sales employees: Salary = 2000000 + TotalAmountOfSales\*0.1
* For Manager: Salary = 4000000 + Bonuss

Bonus, DaysOff and TotalAmountOfSales are set up manually when the company needs to calculate salary for each employee.

Write a program to help this company in managing employees. Note that the company already had some functions to store and to print employees information that the company does not want to change. Write your code to fullfill the company needs without changing what has been existed before.

Hint: inheritance. You will also need to define different extra attributes with getters and setters for each kind of employee in order to calculate their salary.

class Employee

{

protected:

int id;

string name;

string dateOfBirth; //mmddyyyy format

public:

Employee(int \_id, string \_name, string \_dateOfBirth);

void print();

virtual int calculateSalary()=0;

};

Employee::Employee(int \_id, string \_name, string \_dateOfBirth)

{

this->id = \_id;

this->name = \_name;

this->dateOfBirth = \_dateOfBirth;

}

void Employee::print()

{

cout<<"Employee's ID: "<< this->id<<”\n”;

cout<<"Name: "<<this->name<<”\n”;

cout<<"Date of Birth: "<<this->dateOfBirth<<”\n”;

cout<<"Salary: "<<this->calculateSalary()<<”\n \n”;

}

**Problem 2: Polymorphism (3 points)**

The company now wants to store information of all employee in only one array. Supposed that the company has 3 secrectary, 4 sales man, and 1 manager. Write code to create those 8 employees and set up data for them. Try to store them in only one array named “list” so that these following code can be used to print all employees’ information:

for (int i=0; i<8;i++)

{

list[i]->print();

}

Hint: polymorphism. Try to use “new” key word.

**Problem 3: Algorithm (2 points)**

The company now wants to sort employees in ascending order of their names. Write code to sort and print all employees’ information.