King Saud University
College of Computer and Information Sciences
CSC111
Lab Project

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- الموعد النهائي للتسليم هو يوم الخميس ١٠ ديسمبر ٢٠٢٠

- المشروع فردي ولا يسمح بالمجموعات.

- لن يتم التسامح في الغش.

- التسليم يكون عن طريق منصة LMS أو عن طريق البريد الإلكتروني.

- يتم تسليم المشروع في ملف مضغوط.

- اكتب اسمك ورقمك الجامعي ورقم الشعبة في بداية كل صفحة من برنامجك.

- خمس درجات هي الدرجة الكاملة للمشروع.

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Write a class `Employees` that stores a list of employees' IDs, names, years, salaries, and departments in a given class. The class allows the user to add an employee, look for employees by id, find the employee with the highest salary in a department, calculate the bonus for an employee, and display an employee data. Here is the UML diagram:

Company
+ main()

Employees
–ids[]: int –names[]: String –years[]: int –salaries[]: double –departments[]: String –nEmployees: int
+Employees() +getNEmployees(): int +addEmployee(id: int, name: String, years: int, salary: double department: String): int +findEmploye(id: int) : int +findHighestSalary(department: String) : int +printEmployee(index: integer) +printAll(): void +calculateBonus(index: int): double
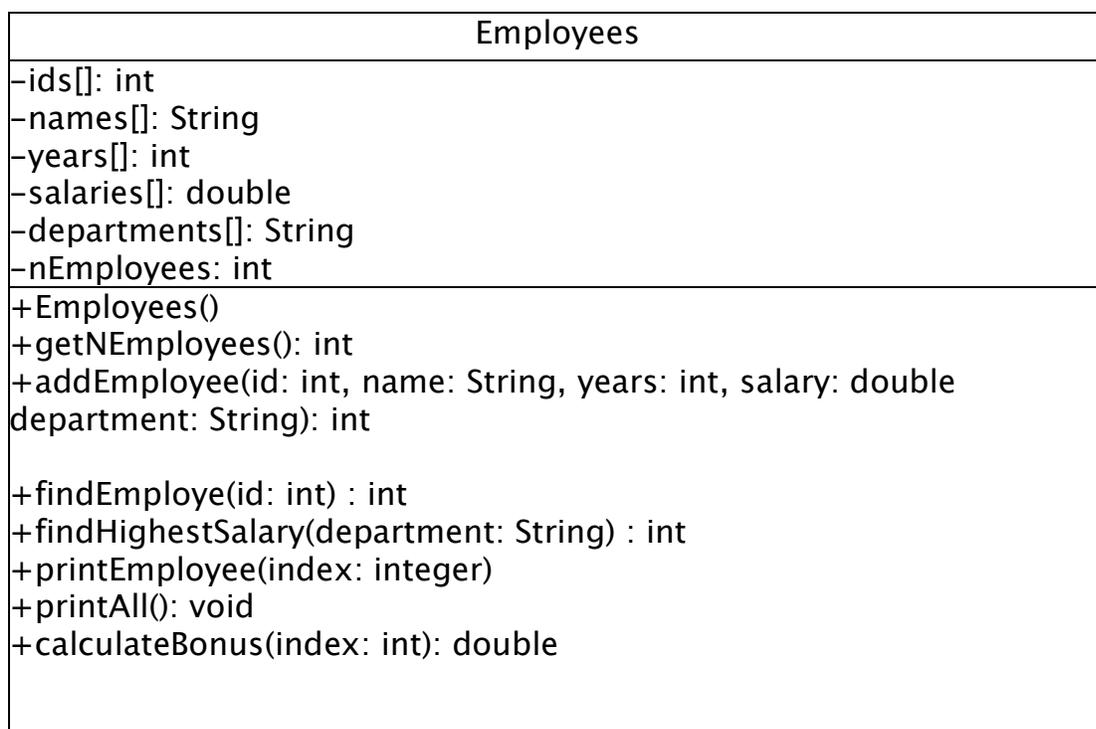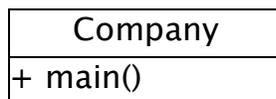
As shown in the UML diagram, write the class `Employees` that has the attributes: `ids`, `names`, `years`, `salaries`, and `departments` that represent the list of IDs, names, years, salaries, and departments of each employee in the class, respectively. The attribute `nEmployees` represents the current number of employees in the list. The maximum number of employees in the class is 50.
The methods are:
- `Employees`: a constructor that initializes the attributes.
- `getNEmpolyees` : returns the current number of employees.

- `addEmployee`: adds the employee with the given data to the list then return 1. If there is an employee with the same ID return -1. If the array is full return -2. You should not print anything in this method.
- `findEmployee`: returns the index of the employee whose id is the id received by the method. If it is not found, -1 is returned.
- `findHighestSalary`: returns the index of an employee who works in department `department` and has the highest salary. If the department doesn't exist, return -1.
- `printEmployee`: displays all data of the employee at index `index`. If the index `index` is larger than or equals the number of employees or less than 0, print " Error cannot print".
- `printAll`: displays all data of all employees. If the list is empty print "The list is empty".
- `calculateBonus`: calculate the bonus of an employee based on his years:
  ```
  *    years less than 5 he gets 2 salaries
  *    years between 5 and 10 he gets 3 salaries
  *    years more than 10 he gets 4 salaries
  ```
  note: before you call this method you should check that the id is in the list otherwise print "ID is not correct!"

Write a main class called `Company` with a `main` method that will show a menu as following:
```
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
```

1-Add employee: you should ask the user to enter id, name, years, salary, and department. Then, if the id is not already used and the array is not full add the employee to the list. If the add operation is completed print "Added". If the id is found in the list print "Cannot add! ID is already used" If the array is full print "Cannot add! array is full!".

2-Print employee: you should ask the user to enter the id of the employee he wants to print. Hint: use method findEmployee and method printEmployee

3-Print all employees: simply call method printAll

4-calculate the bonus: you should ask the user to enter the id of the employee then print all information of that employee and the calculated bonus. If the id is not found print "ID is not correct".

5-Find highest salary: you should ask the user to enter the department then print the information of the employee with the highest salary in that department. If the department is not found print " The department is not found!"

6-Exit: print "Thanks goodbye!" and exit the program

If any other choice is entered you should print " incorrect input please try again!"

Sample run:

```
************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
************************
Enter your choice:3
The list is empty!
************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
************************
Enter your choice:1
Enter ID, Name, Years, Salary, Department:
111 Ahmed 3 1000 IT
Added
************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
************************
Enter your choice:1
Enter ID, Name, Years, Salary, Department:
111 Ahmed 3 1000 IT
```

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```
Cannot add! ID is already used!
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:1
Enter ID, Name, Years, Salary, Department:
222 Khaled 5 2000 HR
Added
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:1
Enter ID, Name, Years, Salary, Department:
333 Ali 10 2000 IT
Added
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:1
Enter ID, Name, Years, Salary, Department:
444 Fahd 11 3000 HR
Added
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:3
ID: 111. Name: Ahmed. Years: 3. Salary: 1000.0. Department: IT
ID: 222. Name: Khaled. Years: 5. Salary: 2000.0. Department: HR
ID: 333. Name: Ali. Years: 10. Salary: 2000.0. Department: IT
ID: 444. Name: Fahd. Years: 11. Salary: 3000.0. Department: HR
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
```

```
6-Exit
*************************
Enter your choice:2
Enter the ID of the employee you want to print: 555
Error cannot print
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:2
Enter the ID of the employee you want to print: 111
ID: 111. Name: Ahmed. Years: 3. Salary: 1000.0. Department: IT
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:4
Enter the ID of the employee: 111
Employee: ID: 111. Name: Ahmed. Years: 3. Salary: 1000.0. Department: IT
Bonus: 2000.0
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:4
Enter the ID of the employee: 222
Employee: ID: 222. Name: Khaled. Years: 5. Salary: 2000.0. Department: HR
Bonus: 6000.0
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:4
Enter the ID of the employee: 333
Employee: ID: 333. Name: Ali. Years: 10. Salary: 2000.0. Department: IT
Bonus: 6000.0
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
```

4-calculate the bonus
5-Find highest salary
6-Exit
****
Enter your choice:4
Enter the ID of the employee: 444
Employee: ID: 444. Name: Fahd. Years: 11. Salary: 3000.0. Department: HR
Bonus: 12000.0
****
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
****
Enter your choice:4
Enter the ID of the employee: 555
ID is not correct!
****
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
****
Enter your choice:5
Enter the department: IT
The employee with highest salary in the IT department is: ID: 333. Name: Ali. Years: 10. Salary: 2000.0. Department: IT
****
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
****
Enter your choice:5
Enter the department: HR
The employee with highest salary in the HR department is: ID: 444. Name: Fahd. Years: 11. Salary: 3000.0. Department: HR
****
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
****
Enter your choice:5
Enter the department: aaa
The department is not found!
****
Please choose:
1-Add employee
2-Print employee
3-Print all employees

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```
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:7
incorrect input please try again!
*************************
Please choose:
1-Add employee
2-Print employee
3-Print all employees
4-calculate the bonus
5-Find highest salary
6-Exit
*************************
Enter your choice:6
Thanks goodbye!
```