Data Structures and Algorithm (DSA)

**Minor Project-1 (2023)**

(Last Date of Submission: 15/05/2023)

**Problem:** To create an Employee database using class and object.

**Description:** Create a class **Employee** with the following members:

|  |  |
| --- | --- |
| **Fields** | **Type** |
| name | String |
| empId | int |
| salary | double |
| hireDate | Date |
| jobPosition | String |
| contactNumber | String |
| address | Address |

Observe here that **Date** and **Address** are also the classes. Add appropriate fields and methods to

Date and Address classes. Add appropriate constructors to set the fields of Employee. More over

you can add appropriate setter/getter methods if required. [2 points]

Write a Java program to do the following operations. (Create a Test class with a main() method)

• Create an employee database of a company having 500 employees: You can create an array

of objects. [2 points]

• Arrange the employee details in descending order by salary: Create a method in Test class

with the following signature: [2 points]

**public static void arrangeEmployeeBySalary(Employee e[])**

• Display the details of employees whose jobPosition is manager: Create a method in Test

class with the following signature: [2 points]

**public static void getEmployeesByJobPosition(Employee e[], String jp)**

• Display the details of employees whose hireDate is between 01-04-2022 to 31-03-2023:

Create a method in Test class with the following signature: [3 points]

**public static void getEmployeesByHireDate(Employee e[], Date d1, Date d2)**

• Find the number of foreign employees: You can find it from the country code of the

contactNumber field. Create a method in Test class with the following signature: [2 points]

**public static int foreignEmployeeCount(Employee e[])**

• Display the details of employees whose salary is in a range 150000 INR to 300000 INR:

Create a method in Test class with the following signature: [2 points]

**public static void getEmployeesBySalary(Employee e[], double s1, double s2)**

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**DESCRIPTION**

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* In the project, there are two .java files; one file contains classes Employee, Date and Address. The other file contains only Test class.
* Employee class comprise of a constructor to initialize the instance variables for creation of each object. The class also comprise of a display() method to display details of a particular Employee object.
* Class Date and Address are created in order to be used as preferred data types for instance variables in class Employee.
* In the file named ‘Test.java’, Scanner class has been used in order to make the code user friendly as much as possible. The class Test in particular has the methods, which are:-
  + **arrangeEmployeeBySalary**
    - the method definition contains two nested ‘for’ loops in order to arrange the array according to salary in descending order
    - method signature already provided in the problem description
    - parameter passed is the array of employee(s)
* **getEmployeesByJobPosition**
  + the method definition comprise of a single ‘for’ loop encasing a conditional statement, upon which being true, i.e., if the String parameter that is passed is same *(ignoring the case of string by using equalsIgnoreCase method(<“ ”>):built in method)* then the details of employees with the same or required designation are displayed
  + method signature already provided in the problem description
  + parameters passed are the array of employee(s) and the designation or job position
* **getEmployeesByHireDate**
  + the method definition comprise of single ‘for’ loop encasing nested if blocks checking for a specific date to be true in order to be the block to be executed
  + **somehow there occurs some lack of basic knowledge for basic dates related classes due to which this method doesn’t produces the necessary or desired output**
* **foreignEmployeeCount**
  + a counter variable has been declared and initialised
  + a single ‘for’ loop iterates through the passed employee array, and the if block inside the loop checks the country code of the contact number passed in the method on calling
  + method signature already provided in the problem description
* **getEmployeesBySalary**
  + method comprise of single ‘for’ loop iterating through the passed array of employees to the method at call
  + if block inside the loop checks if the respective employees have the salary within the range of salary that is passed in the method call
  + according to the fulfilment of the necessary conditions the details of the employees are then displayed
  + **main**
    - contains creation of array of Employee class, serving the purpose of creating space for number of employees for the database
    - contains a ‘for’ loop to collect relative data for each employee for the database; upon successful creation of which displays “Input Successful…”
    - then the method **arrangeEmployeesBySalary** is called in order to sort the array of employees according to their salaries in descending order
    - then the method **getEmployeesByJobPosition** is called to print the details of particular employee(s), previous to which we ask for input of a designation, and this is exactly what the method displays, the details of employee(s) with particular designation or job position passed as input
    - similarly dates are entered by the user in order to be passed to the method **getEmployeesByHireDate**, only to display the details of employees hired in a specific range of dates
    - then we display the number of foreign employees based on their country codes in contact number, from the method **foreignEmployeeCount**
    - then details of employees are displayed based on their salaries, for which we take input of range of salary, and passing the same to the method **getEmployeesBySalary**