

Department of Information Systems and Technologies  
**CTIS221 – Object Oriented Programming**  
SPRING 2024 - 2025  
**Lab Guide 9 - Week 7 - 2**

**OBJECTIVES:** Object Methods, Array of objects, System Classes

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**Q1.** Write a Java program that manages and displays information of **Employee** objects. Create an **Employee** class structure with the given data members. Also, implement a no-arg constructor, necessary getters & setters, and a **toString()** method.

Then create a **CompanyManagementSys** class that has a static data member of type integer named **MAX\_CAPACITY** (constant), a static data member of type **Employee[]** named **employees**, and a static integer **count** data member. Also, implement the static methods **addEmployee()**, **searchEmployeeById()**, **searchEmployee()**, **calculateAverageSalary()**, and **display()**.

Finally, create a **EmployeeMain** class that has the static **main()** method.

Employee	CompanyManagementSys	
- name: String - id: int - salary: double - isManager: boolean	- MAX_CAPACITY = 5: int - employees: Employee[] - count: int	
+ Employee() + getInput(): void + getId(): int + getName(): String + getSalary(): double + getManagerStatus(): boolean + setSalary(double): void + setId(int): void + toString(): String	+ addEmployee(): void + searchEmployeeById(int): boolean + searchEmployee(int): Employee + calculateAverageSalary(): double + display(): String	
	<th>EmployeeMain</th>	EmployeeMain
	+ main(String[] args): void	

Create an **Employee** class with the following instructions:

- Implement a **getInput()** method that gets the data member values from the user. The method should ask the user if the employee is a manager, taking Y/y or N/n as input and setting the boolean value of **isManager** accordingly.
- Implement necessary getter & setter methods.
- Implement a **toString()** method. The method should check whether the employee is a manager or not. Display manager status accordingly.

Create a **CompanyManagementSys** class with the following instructions:

- Declare a static final member **MAX\_CAPACITY** to define the maximum size of the employees array. The value will be 5.

- Declare and create an object array **employees** of type **Employee[]** with **MAX\_CAPACITY** constant value (5) as its size.
- Declare a static member count to store the number of employees.
- Implement an **addEmployee()** method that gets employee information by invoking the **getInput()** method for each Employee object. It should check whether an employee ID is already assigned by invoking the **searchEmployeeById()** method and store the object in the **employees** array if the ID is available. Also, ask the user if they want to continue adding new employees (Y/N: Y for yes, N for no). If the user enters 'N', the loop terminates. The method also checks whether **MAX\_CAPACITY** has been reached or not.
- Implement a **searchEmployeeById()** method that takes an employee ID as a parameter, searches the ID in each Employee object in the **employees** array, and returns true if the ID is available, otherwise false.
- Implement a **searchEmployee()** method that takes the **ID** of the employee as a parameter and searches for the employee **ID** in each employees array. If found, return the object; else, return null.
- Implement a **display()** method to display the objects in the **Employees** array.
- Implement a **calculateAverageSalary()** method in the **CompanyManagementSys** class that loops through the employees array and calculates the average salary of all employees in the array.
  - o It should return the average salary value as a double.
  - o If no employees are present, it should return 0.

Create an **EmployeeMain** class with the following instructions:

- Input 5 Employee objects by invoking the **addEmployee()** method of the **CompanyManagementSys** class.
- Try to input an **Employee** object that has the same ID as one of the employee objects already in the **Employees** array.
- Try to add 2 more **Employee** objects to exceed **MAX\_CAPACITY**.
- Display all employees by invoking the **display()** method of the **CompanyManagementSys** class.
- Calculate the average salary of employees in the array by invoking the **calculateAverageSalary()** method of the **CompanyManagementSys** class, and display the average salary.
- Ask the user which employee to search by ID, and then display it using the **searchEmployee()** method of the **CompanyManagementSys** class.

**Output:**

```

Enter Employee Id: 1
Enter Employee Name: Efe
Enter Employee Salary: 10000
Is the employee a manager? (Y/N): Y
Employee added successfully!
Do you want to add another employee? (Y/N): Y
Enter Employee Id: 2
Enter Employee Name: Ege
Enter Employee Salary: 20000
Is the employee a manager? (Y/N): Y
Employee added successfully!
Do you want to add another employee? (Y/N): Y
Enter Employee Id: 3
Enter Employee Name: Ugur
Enter Employee Salary: 30000
Is the employee a manager? (Y/N): N
Employee added successfully!
Do you want to add another employee? (Y/N): Y
Enter Employee Id: 3

```

Employee ID already exists. Please enter a different ID.

Enter Employee Id: 4

Enter Employee Name: Cagla

Enter Employee Salary: 40000

Is the employee a manager? (Y/N): Y

Employee added successfully!

Do you want to add another employee? (Y/N): Y

Enter Employee Id: 5

Enter Employee Name: Ebru

Enter Employee Salary: 50000

Is the employee a manager? (Y/N): N

Employee added successfully!

Do you want to add another employee? (Y/N): y

Maximum capacity of employees reached.

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Here is a list of the Employees:

Employee Name=Efe,

Id=1,

Salary=10000.0,

Manager Status=Employee is a manager.

Employee Name=Ege,

Id=2,

Salary=20000.0,

Manager Status=Employee is a manager.

Employee Name=Ugur,

Id=3,

Salary=30000.0,

Manager Status=Employee is not a manager.

Employee Name=Cagla,

Id=4,

Salary=40000.0,

Manager Status=Employee is a manager.

Employee Name=Ebru,

Id=5,

Salary=50000.0,

Manager Status=Employee is not a manager.

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Avg of all Employee Salaries: 30000.00

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Which employee would you like to search? Enter their id: 4

Here is the employee you were looking for...

Employee Name=Cagla,

Id=4,

Salary=40000.0,

Manager Status=Employee is a manager.