

Data structures Project

Employee record management system using linked list

Problem: Create an employee Record Management system using linked list that can perform the following operations:

- **Insert employee record**

```
public void insert(Employee employee) {
    Node newNode = new Node(employee);
    if (head == null) {
        head = newNode;
    } else {
        Node current = head;
        Node prev = null;
        while (current != null && current.data.id < employee.id) {
            prev = current;
            current = current.next;
        }
        if (prev == null) {
            newNode.next = head;
            head = newNode;
        } else {
            prev.next = newNode;
            newNode.next = current;
        }
        System.out.println("insert successfully");
    }
}
```

- **Delete employee record**

```
public void delete(int id) {
    if (head == null) {
        System.out.println("Employee list is empty");
        return;
    }
}
```

```

    }
    Node current = head;
    Node prev = null;
    while (current != null && current.data.id != id) {
        prev = current;
        current = current.next;
    }
    if (current == null) {
        System.out.println("Employee with ID " + id + " not found");
        return;
    }
    if (prev == null) {
        head = head.next;
    } else {
        prev.next = current.next;
    }
    System.out.println("Employee with ID " + id + " deleted");
}

```

- **Update employee record**

```

public void update(int id, Employee newEmployee) {
    Node current = head;
    while (current != null && current.data.id != id) {
        current = current.next;
    }
    if (current == null) {
        System.out.println("Employee with ID " + id + " not found");
        return;
    }
    current.data = newEmployee;
    System.out.println("Employee with ID " + id + " updated");
}

```

- **Show details of an employee**

```

public void display() {
    Node current = head;
    if (current == null) {
        System.out.println("Employee list is empty");
        return;
    }
    while (current != null) {

```

```

        displayEmployeeDetails(current.data);
        current = current.next;
    }
}

public void display(int id) {
    Node employeeNode = findEmployee(id);
    if (employeeNode != null) {
        displayEmployeeDetails(employeeNode.data);
    } else {
        System.out.println("Employee with ID " + id + " not found");
    }
}

private void displayEmployeeDetails(Employee emp) {
    System.out.println("Name: " + emp.name);
    System.out.println("ID: " + emp.id);
    System.out.println("First Day of Work: " + emp.hireDate);
    System.out.println("Phone Number: " + emp.phoneNumber);
    System.out.println("Address: " + emp.address);
    System.out.println("Work Hours: " + emp.workHours);
    System.out.println("Salary: " + emp.salary);
    System.out.println();
}

private Node findEmployee(int id) {
    Node current = head;
    while (current != null) {
        if (current.data.id == id) {
            return current;
        }
        current = current.next;
    }
    return null; // Employee not found
}

```

- **Search an employee**

```

public Employee search(int id) {
    Node current = head;
    while (current != null && current.data.id != id) {
        current = current.next;
    }
    if (current == null) {

```

```

        System.out.println("Employee with ID " + id + " not found");
        return null;
    }
    return current.data;
}

```

- **Update the salary of an employee**

```

public void updateSalary(int id, double percentIncrease) {
    Node current = head;
    while (current != null && current.data.id != id) {
        current = current.next;
    }
    if (current == null) {
        System.out.println("Employee with ID " + id + " not found");
        return;
    }
    double currentSalary = current.data.salary;
    current.data.salary = currentSalary + (currentSalary * percentIncrease / 100);
    System.out.println("Salary updated for employee with ID " + id);
}
}

```

The employee record should contain the following items

- Name of Employee
- ID of Employee
- First day of work
- Phone number of the employee
- Address of the employee
- Work hours
- Salary

```

public class Employee {
    String name;
    int id;
    Date hireDate;
    String phoneNumber;
    String address;
    int workHours;
    double salary;
}

```

```

    public Employee(String name, int id, Date hireDate, String phoneNumber, String address,
int workHours, double salary) {
    this.name = name;

    // Validate and set ID
    if (id <= 0) {
        throw new IllegalArgumentException("ID must be a positive integer.");
    }
    this.id = id;

    // Validate and set hire date
    this.hireDate = hireDate;

    // Validate and set phone number
    if (!isValidPhoneNumber(phoneNumber)) {
        throw new IllegalArgumentException("Invalid phone number format.");
    }
    this.phoneNumber = phoneNumber;

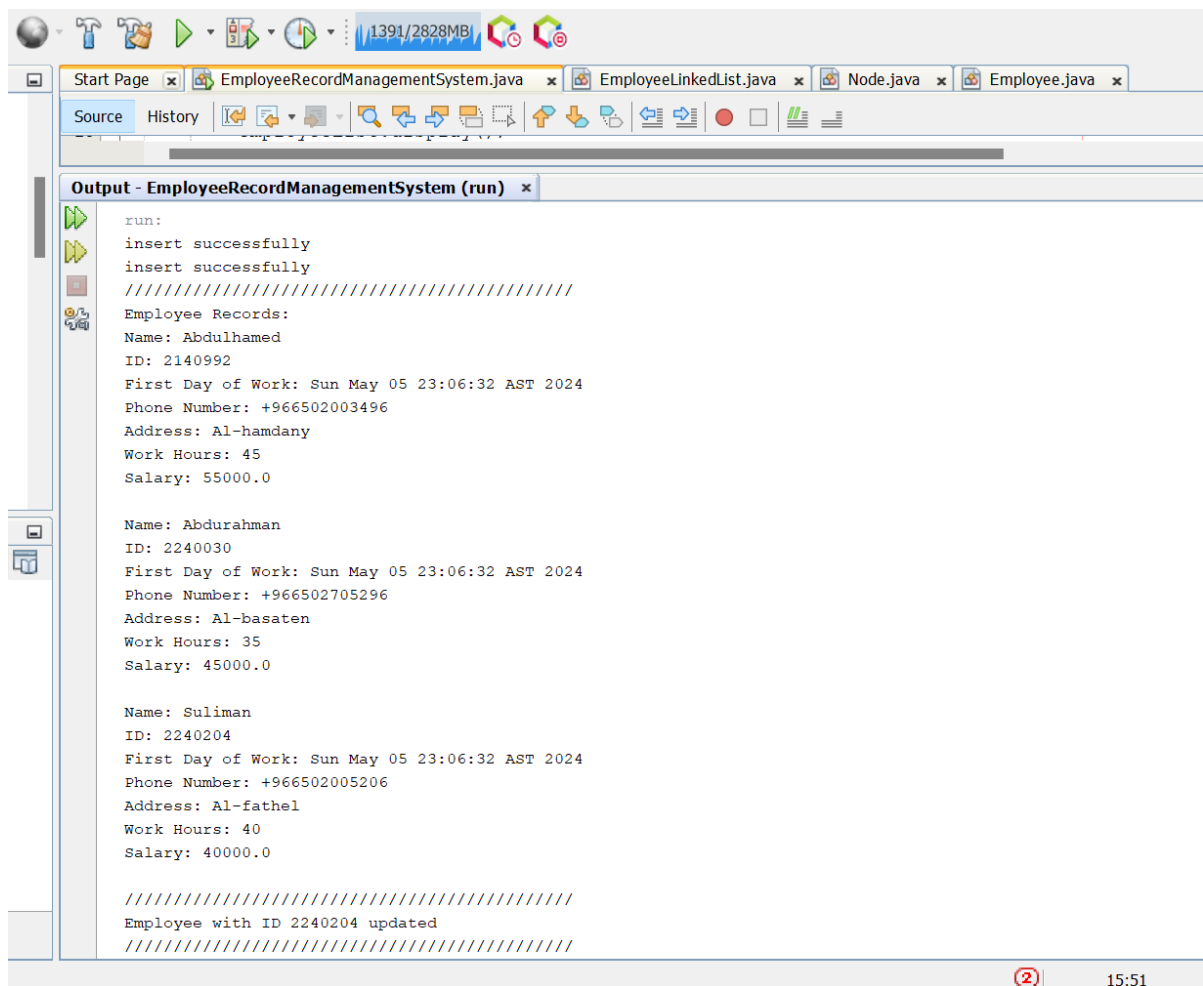
    // Set other attributes
    this.address = address;
    this.workHours = workHours;
    this.salary = salary;
}

// Method to validate phone number format
private boolean isValidPhoneNumber(String phoneNumber) {
    // Regex pattern for +966 followed by 9 digits
    String regex = "^\\+966\\d{9}$";
    return Pattern.matches(regex, phoneNumber);
}
}

```

OUTPUT:

1-insert and display methods



```
run:
insert successfully
insert successfully
////////////////////////////////////
Employee Records:
Name: Abdulhamed
ID: 2140992
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502003496
Address: Al-hamdany
Work Hours: 45
Salary: 55000.0

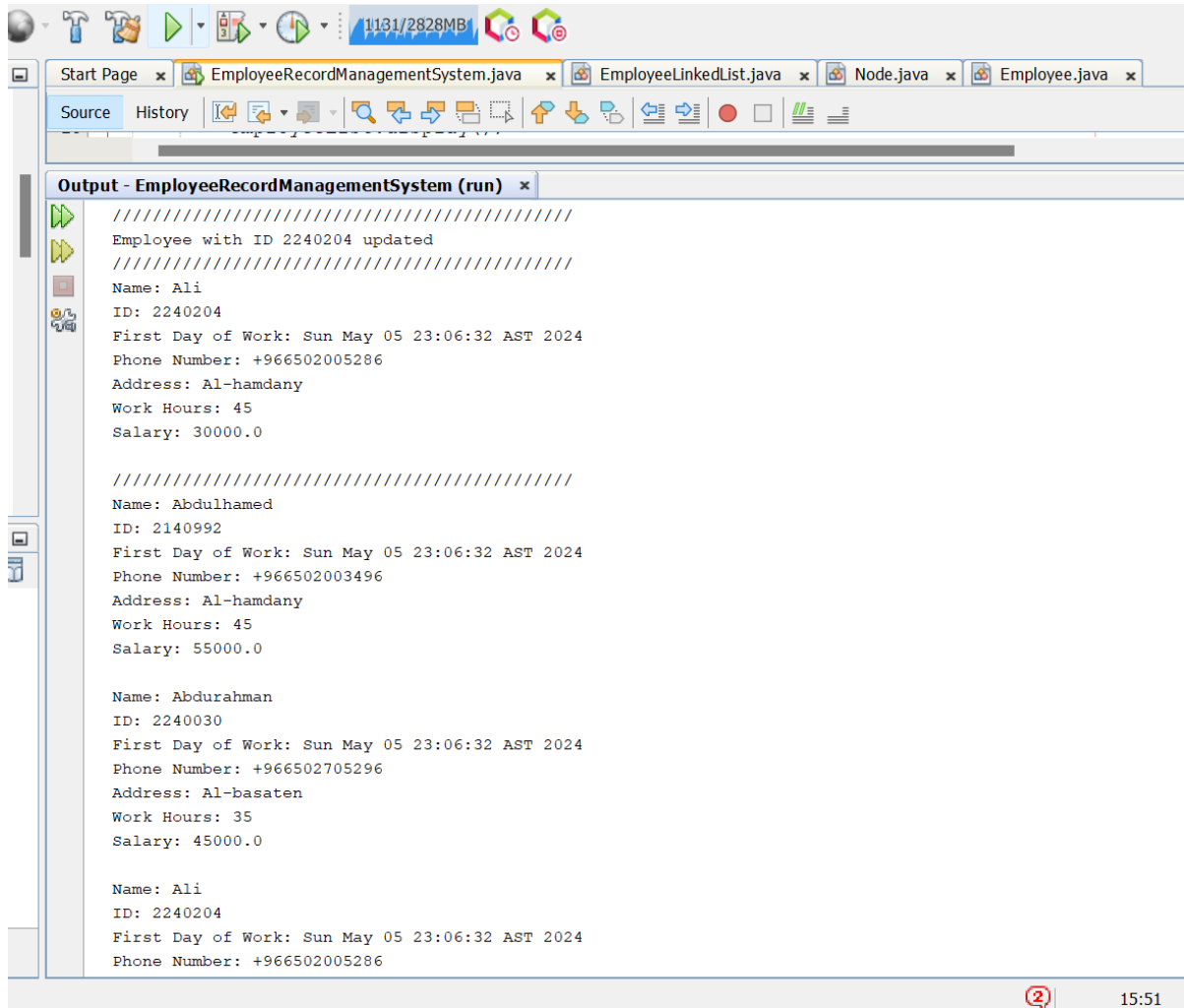
Name: Abdurahman
ID: 2240030
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502705296
Address: Al-basaten
Work Hours: 35
Salary: 45000.0

Name: Suliman
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502005206
Address: Al-fathel
Work Hours: 40
Salary: 40000.0

////////////////////////////////////
Employee with ID 2240204 updated
////////////////////////////////////
```

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2- Update and Display methods:



```
Start Page x EmployeeRecordManagementSystem.java x EmployeeLinkedList.java x Node.java x Employee.java x
Source History
Output - EmployeeRecordManagementSystem (run) x
Employee with ID 2240204 updated
Name: Ali
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502005286
Address: Al-hamdany
Work Hours: 45
Salary: 30000.0

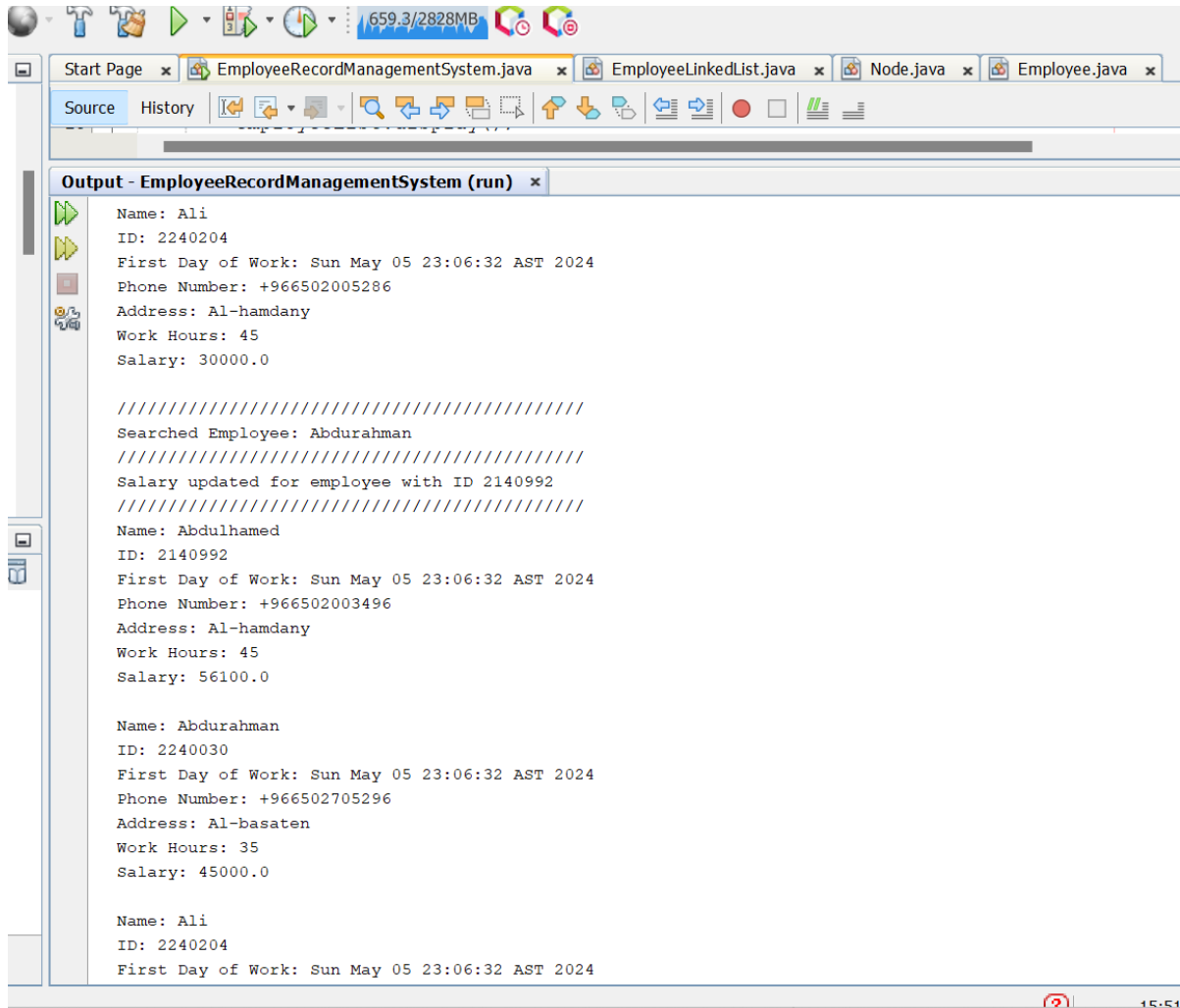
Name: Abdulhamed
ID: 2140992
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502003496
Address: Al-hamdany
Work Hours: 45
Salary: 55000.0

Name: Abdurahman
ID: 2240030
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502705296
Address: Al-basaten
Work Hours: 35
Salary: 45000.0

Name: Ali
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502005286
```

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3- Search and Update Salary methods:



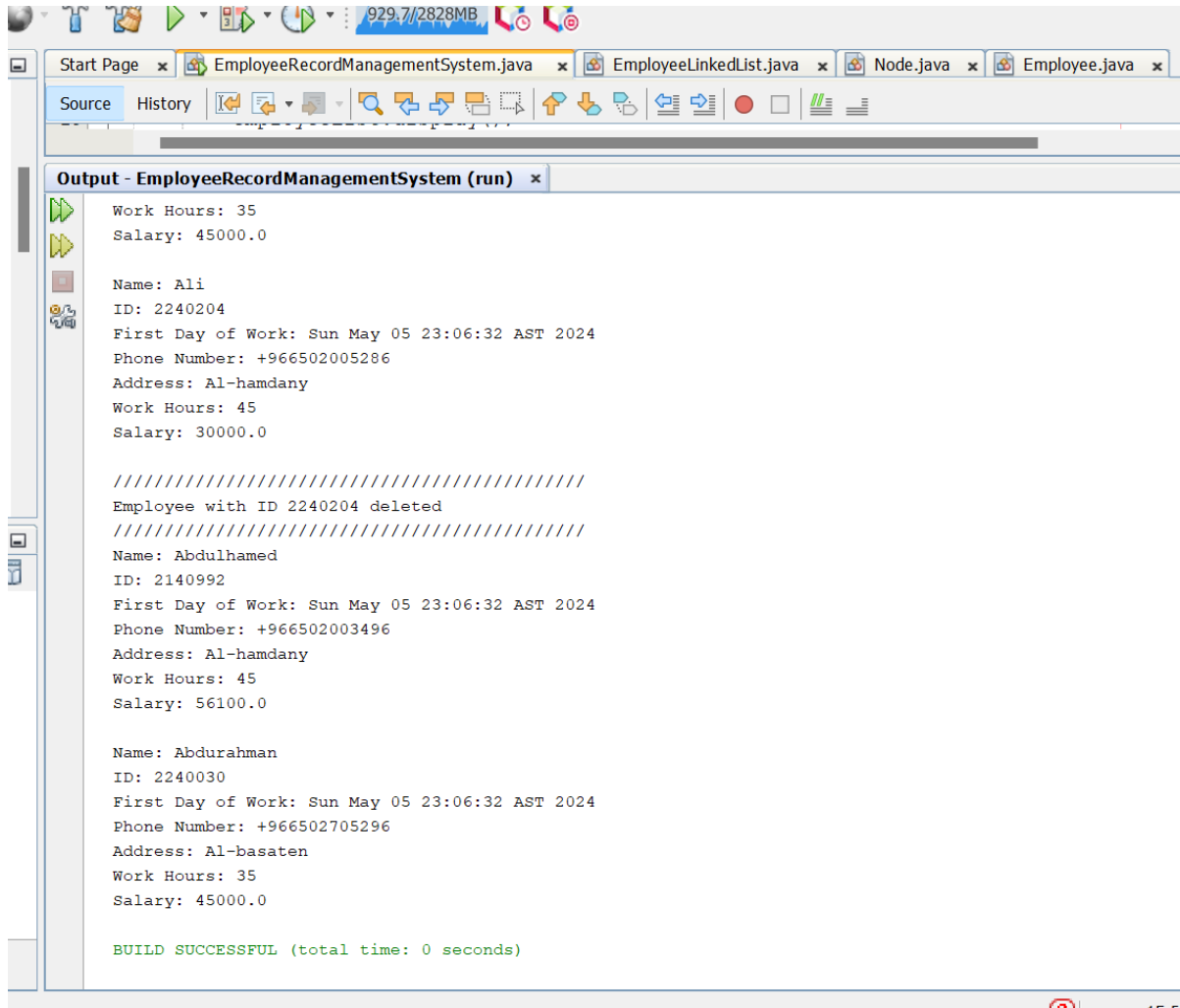
```
Output - EmployeeRecordManagementSystem (run) x
Name: Ali
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502005286
Address: Al-hamdany
Work Hours: 45
Salary: 30000.0

////////////////////////////////////
Searched Employee: Abdurahman
////////////////////////////////////
Salary updated for employee with ID 2140992
////////////////////////////////////
Name: Abdulhamed
ID: 2140992
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502003496
Address: Al-hamdany
Work Hours: 45
Salary: 56100.0

Name: Abdurahman
ID: 2240030
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502705296
Address: Al-basaten
Work Hours: 35
Salary: 45000.0

Name: Ali
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
```


4- Delete and Display methods:



```
Start Page x EmployeeRecordManagementSystem.java x EmployeeLinkedList.java x Node.java x Employee.java x
Source History
Output - EmployeeRecordManagementSystem (run) x
Work Hours: 35
Salary: 45000.0

Name: Ali
ID: 2240204
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502005286
Address: Al-hamdany
Work Hours: 45
Salary: 30000.0

////////////////////////////////////
Employee with ID 2240204 deleted
////////////////////////////////////

Name: Abdulhamed
ID: 2140992
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502003496
Address: Al-hamdany
Work Hours: 45
Salary: 56100.0

Name: Abdurahman
ID: 2240030
First Day of Work: Sun May 05 23:06:32 AST 2024
Phone Number: +966502705296
Address: Al-basaten
Work Hours: 35
Salary: 45000.0

BUILD SUCCESSFUL (total time: 0 seconds)
```

Teams:

Name: Suliman Majrashy ID:2240204

Name : Abdurahman Al- Nhary ID: 2240030

Name : Abdulhamed Al-Bushra ID: 2140992