

Test Cases for Employee Management System

a) Update Employee Data

Test Case ID: EMP_UPDATE_01

Initialization:

- Test database contains employee EmpID = 1001 with known values:
 - First name: "John"
 - Last name: "Doe"
 - Job title: "Developer"
 - Division: "IT"
 - Salary: 75000.00
 - SSN: "123456789"
 - Full-time: true
- Application is running via ConsoleUI.start()
- EmployeeDAOImpl and DBConnection are properly configured

Input:

- EmpID: 1001
- New values:
 - Job title: "Senior Developer"
 - Division: "Engineering"
 - Salary: 85000.00

Test Steps:

1. From main menu, choose "2. Update Employee"
2. Enter 1001 as employee ID
3. Modify job title to "Senior Developer", division to "Engineering", salary to 85000.00
4. Submit the update (calls EmployeeDAOImpl.updateEmployee())
5. Re-query employee 1001 via "4. Search Employee" → "1. Employee ID"

Expected Output:

- EmployeeDAOImpl.updateEmployee() returns true
- System displays "Updated successfully."
- Re-query shows updated values: job_title="Senior Developer", division="Engineering", salary=85000.00
- Unchanged fields (empid, first_name, last_name, SSN, hire_date, is_full_time) remain identical
- No SQL exceptions or errors occur

Tear Down:

- Restore employee 1001 to original values via direct database update

b) Search for Employee

Test Case ID: EMP_SEARCH_01

Initialization:

- Database contains at least three employees:
 - EmpID=2001, first_name="Alice", last_name="Jones", SSN="111223333"
 - EmpID=2002, first_name="Bob", last_name="Smith", SSN="222334444"
 - EmpID=2003, first_name="Alicia", last_name="Brown", SSN="333445555"
- EmployeeDAOImpl search methods are operational

Input & Test Steps:

Subcase 1: Search by EmpID

1. Choose "4. Search Employee" → "1. Employee ID"
2. Enter 2002
3. Execute search (calls EmployeeDAOImpl.getEmployeeById(2002))

Subcase 2: Search by SSN

1. Choose "4. Search Employee" → "3. SSN"

2. Enter "111223333"

3. Execute search (calls EmployeeDAOImpl.getEmployeeBySSN("111223333"))

Subcase 3: Search by Name (Partial Match)

1. Choose "4. Search Employee" → "2. Name"

2. Enter "Ali"

3. Execute search (calls EmployeeDAOImpl.getEmployeesByName("Ali"))

Expected Output:

- Subcase 1: Exactly one employee returned with EmpID=2002, all fields matching database record

- Subcase 2: Exactly one employee returned with SSN="111223333" (Alice Jones)

- Subcase 3: List containing two employees: Alice Jones (EmpID=2001) and Alicia Brown (EmpID=2003)

- All results displayed via Employee.toString() format

- No crashes; invalid searches return appropriate "Not found" messages

Tear Down

- No data modification required

c) Bulk Salary Increase by Range

Test Case ID: EMP_SALARY_RANGE_01

Initialization:

- Test employees exist with salaries:

- EmpID=3001, Salary=57000.00

- EmpID=3002, Salary=58000.00

- EmpID=3003, Salary=80000.00

- EmpID=3004, Salary=104999.00

- EmpID=3005, Salary=105000.00

- Record original salaries for rollback
- EmployeeService.applySalaryIncrease() and EmployeeDAOImpl.getEmployeesBySalaryRange() are available

Input:

- Minimum salary: 58000.00
- Maximum salary: 105000.00 (exclusive, as per salary >= ? AND salary < ?)
- Percentage increase: 3.2

Test Steps:

1. From main menu, choose "5. Apply Salary Increase (Range)"
2. Enter min=58000, max=105000, percent=3.2
3. Execute operation (triggers EmployeeService.applySalaryIncrease(58000, 105000, 3.2))
4. System calls:
 - EmployeeDAOImpl.getEmployeesBySalaryRange(58000, 105000)
 - Applies 3.2% increase to each employee's salary
 - Calls EmployeeDAOImpl.updateEmployee() for each modified employee
5. Re-query employees 3001-3005 to verify changes

Expected Output:

- Employees affected: 3002, 3003, 3004 (salary >= 58000 AND salary < 105000)
- Employees not affected:
 - 3001 (salary=57000 < min)
 - 3005 (salary=105000 >= max)
- Calculated new salaries:
 - 3002: $58000 \times 1.032 = 59856.00$
 - 3003: $80000 \times 1.032 = 82560.00$
 - 3004: $104999 \times 1.032 = 108359.77$ (rounded to 2 decimal places)
- System returns: "Updated 3 employees."
- No rounding errors or SQL exceptions

Tear Down:

- Reset salaries for EmpID=3001-3005 to original values via database update