

OOP ASSIGNMENT

Tithira Withanaarachchi- Batch 4

Lecturer-
Mahesha Thejani

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Task 1

1.1Features in Java Programming.

Platform Independent-

Java is a software based platform independent environment different to languages such as C , C++ etc. Java is a language that a user can write once and run it in any platform. Java has 2 components called,

- Runtime Environment.
- API (Application Programming interface)

Examples for platforms that java can be run is,

Windows,
Linux,
Sun Solaris,
Mac/OS.

Secured-

Java is famous for its security.

The reason for java to be more secure is-

- Java runs inside its own virtual machine called sandbox.
- It has no explicit pointer which will allow someone to interrupt the security [1].

1.2 Evaluating JVM Environment

Java Virtual Machine is an Engine which make it possible to run java codes. In other programming languages, compiler converts the code for machine language in a way that it suits for the machine, but in Java, the code is compiled in a way that it suits for its own virtual machine(JVM).



Figure 1 Process of the Java Virtual machine [2].

As shown above, in JVM, Source code is compiled to bytecode and this bytecode get interpreted according to the machine in it was implemented in [2].

Task 2

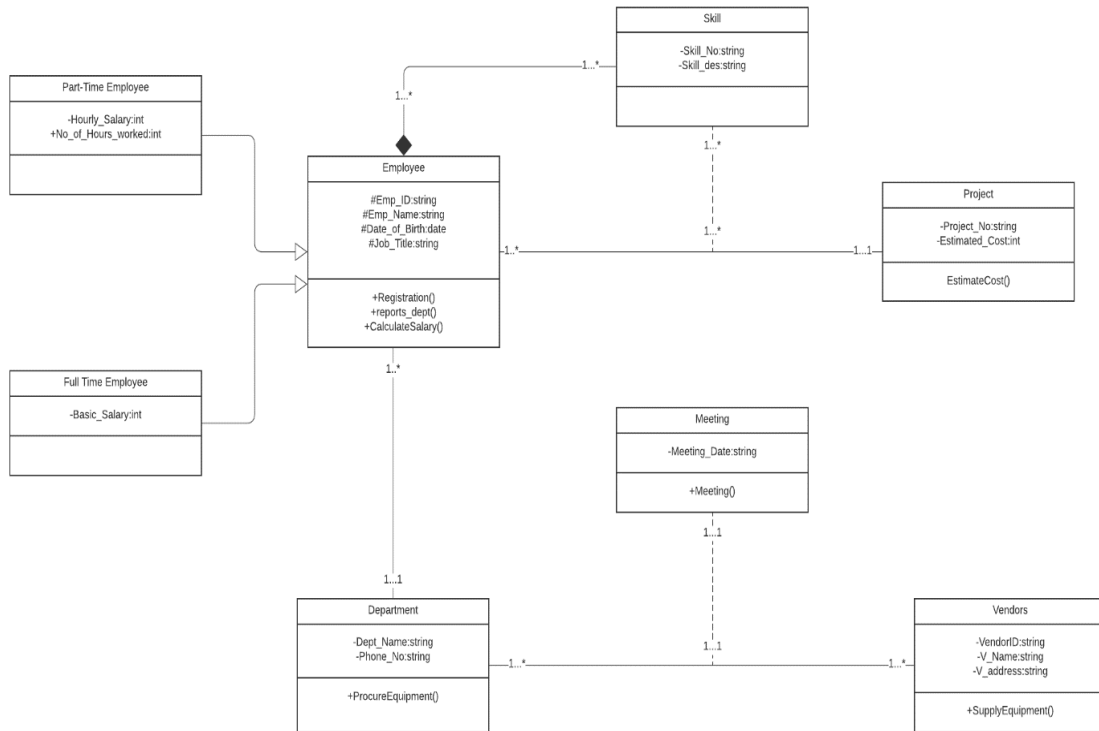
Use Case Diagram

Use case diagram

Tithira Withanaarachchi | January 17, 2021



Class Diagrams



Use Case narratives

Add Records-

Use case name	Add Records to the Employee Entity
Primary actors	Admin
Secondary actors	-----
Normal flow of sequence	<ol style="list-style-type: none">1) Enter valid credentials for the admin Login.2) Click the Login button.3) Select the Entity which the user expects to add records.4) Enter the data related to the record in the relevant input spaces provided.5) Click the Add button.6) System displays a message “Employee Added Successfully”
Alternative flow of sequence	<p>2.1) If invalid credentials , then display a Message “invalid credentials” and do not allow to access the main menu.</p> <p>5) If something wrong with the entered data, display ”Add employee failed”</p>
Pre-conditions	User should be registered to the company as an admin and registered for login by Login registration.
Post-Conditions	Employee table of the database should be updated by adding a new record.

Assign Projects-

Use case name	Assign Project
Primary actors	Manager
Secondary actors	Admin, Registrar
Normal flow of sequence	<ol style="list-style-type: none">1) Login to the system by entering valid credentials for manager Login.2) Click the login button.3) Select the Assign Project Button in the menu.4) Enter the relevant Employee ID and the Project I D in the input spaces provided.5) Click the Add button.6) Display “Project Assigned successfully” by the system.

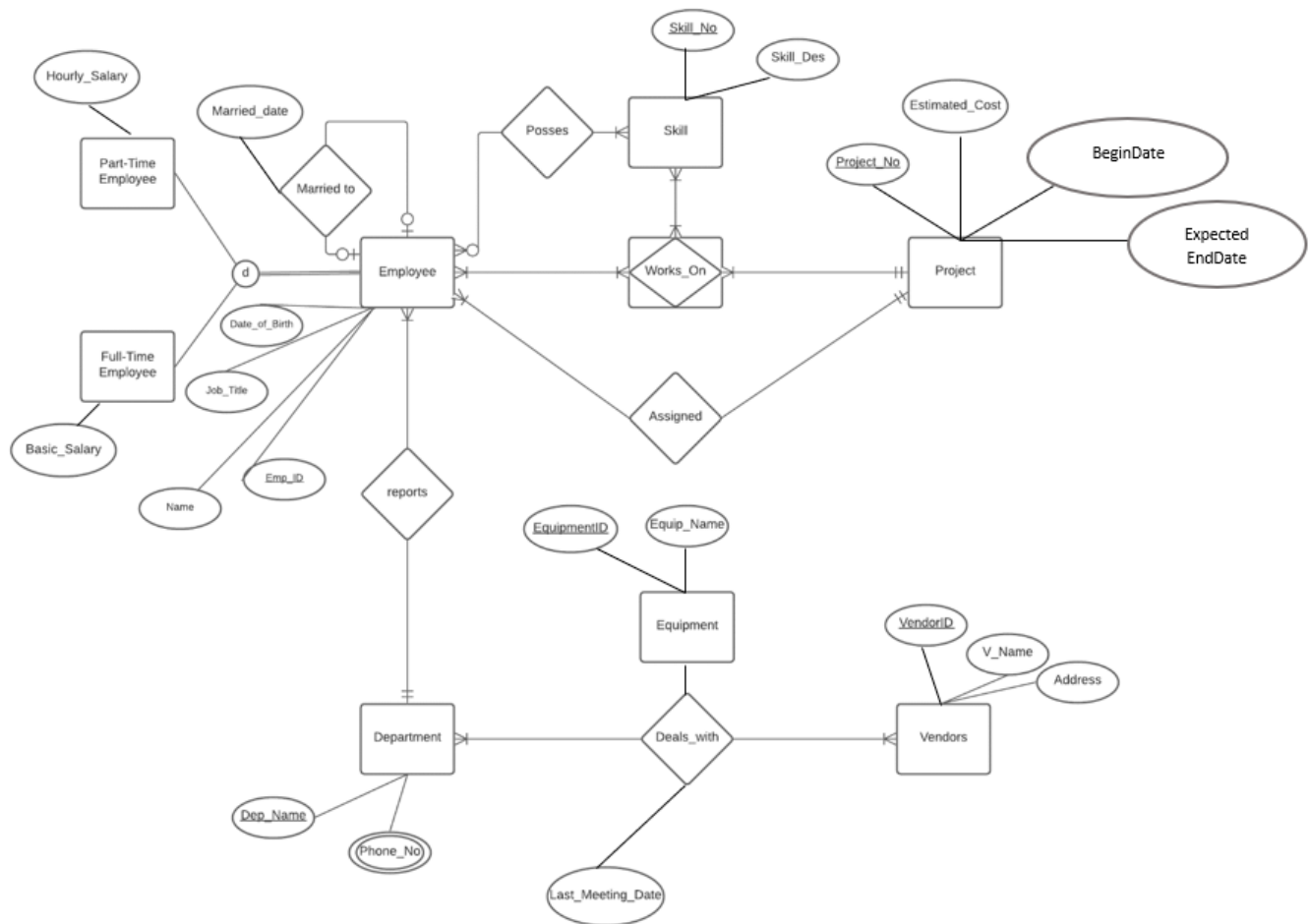
Alternative flow of sequence	<p>2.1) If invalid credentials , then display a Message “invalid credentials” and do not allow to access the main menu for manager.</p> <p>5) If the entered employee ID or Project ID is invalid or if they violate the constraints of the system, Display, Assigning project failed.</p>
Pre-conditions	User should be registered to the company as a Manager and have a valid Manager Login.
Post-Conditions	“Assign_Project table in the database should be updated by adding a new record.

Update Department- Ven

Use case name	Update Meeting
Primary actors	Manager,Registrar
Secondary actors	Admin
Normal flow of sequence	<ol style="list-style-type: none"> 1) Login to the system by entering valid credentials for Login. 2) Click the login button. 3) Select the Update Meeting Button in the menu. 4) Search the record related to the last meeting by entering the correct Department ID and the Vendor ID. 5) Change the last meeting field of the record searched by adding the new last meeting date. 6) Click the update button. 7) Display “Meeting updated successfully by the System.
Alternative flow of sequence	<p>2.1) If invalid credentials, then display a Message “invalid credentials” and do not allow to access the main menu.</p> <p>4.1) If the entered Department ID or Vendor ID is invalid Display an error message.</p>

Pre-conditions	User Should be Registered to the company with a valid login.
Post-Conditions	Update the Department_Vendor table by adding the new last meeting date

ER Diagram



Task 3

3.2 Object Oriented Programming Concepts in the Implementation

Abstraction-

Abstraction is the process of hiding the internal details which will make the code complex and expressing thing in a simple way. This process can be done by using OOP concepts such as encapsulation and inheritance [3].

Basically, in abstraction we consider about what it does before how it should be done.

Encapsulation-

Encapsulation is used for hiding information from the outside world, and it also is applicable for abstraction.

In java, encapsulation is achieved by using access modifiers such as private, public and protected for attributes, methods and classes, while using setters and getters to access them.

Polymorphism-

Poly=Many.

Morphism=forms.

Polymorphism means having many forms of the same thing. In Object Oriented concepts, it refers to operations which behaves in different ways for different objects.

Polymorphism in java is done by method overloading and method overriding.

Method overloading means, the same method acts in different ways depending on the type of inputs which is given to it.

Overriding is writing the same method from the parent class with a different definition in child classes. It allows the programmer to use the same method in different ways depending on whether it's an object of parent class or child class [4].

Inheritance-

Inheritance allows the developer to use some of the attributes and methods of the same class in the child class as well, which will allow the user to develop without repeating the same code again and again [4].

Polymorphism-Example-

```
public class Employee {  
  
    private int EmpID;  
    private String EmpName;  
    private String JobTitle;  
    private String DateofBirth;  
    private String Type;  
    private int Salary;  
  
    public Employee(){  
  
    }  
  
    public Employee(int id){  
        this.EmpID=id;  
    }  
  
    public Employee(int id, String name, String JobT, String DOB, String Type, int salary){  
        this.EmpID=id;  
        this.EmpName=name;  
        this.JobTitle=JobT;  
        this.DateofBirth=DOB;  
        this.Type=Type;  
        this.Salary=salary;  
    }  
}
```

```
}
```

Encapsulation-Example

```
public int getID(){  
    return this.EmpID;  
}  
  
public String getname(){  
    return this.EmpName;  
}  
  
public String getJobT(){  
    return this.JobTitle;  
}  
  
public String getDOB(){  
    return this.DateofBirth;  
}  
  
public String gettype(){  
    return this.Type;  
}  
  
public int getsalary(){  
    return this.Salary;  
}  
  
public void setID( int id){  
    this.EmpID=id;  
  
}
```

```
public void setname(String name){  
    this.EmpName=name;  
}
```

```
public void setJobT(String JobT){  
    this.JobTitle=JobT;  
}
```

```
public void setDOB(String DOB){
```

```
    this.DateofBirth=DOB;
```

```
}
```

```
public void setType(String type){
```

```
    this.Type=type;
```

```
}
```

```
public void setDOB(int salary){
```

```
    this.Salary=salary;
```

```
}
```

```
}
```

3.3 Control Structures in the implementation

Control Structure Example from the code implemented in the insert button of Department entity.

```
private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {  
    //insert Button  
    if("".equals(nametxt.getText()) || "".equals(telnotxt.getText())){  
        statutxt.setText("Any of the attributes cannot be empty");  
  
    }else{  
        Department dob=new Department(nametxt.getText().trim(), telnotxt.getText().trim());  
        boolean status=ddao.insert(dob);  
        if(status==true){  
            statutxt.setText("Department Added Successsfully");  
            nametxt.setText("");  
            telnotxt.setText("");  
  
        }  
        else{  
            statutxt.setText("Add new Department Failed");  
        }  
  
    }  
}
```

```

private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
    //Implementation of Login Button

    if("").equals(untxt.getText())||"".equals(pdtxt.getText()){
        statustxt.setText("UserName and Password cannot be empty");
    }
    else{
        LoginRegistration lr=lrdao.searchbyid((untxt.getText()));
        if(lr.getun()==null){
            statustxt.setText("No Login found with the entered credentials");
        }
        else{
            String username=lr.getun();
            String password=lr.getpd();
            String role=lr.getrole();
            if (untxt.getText().equals(username) && pdtxt.getText().equals(password)&& "Admin".equals(role)){
                this.hide();
                AdminMenu am=new AdminMenu();
                am.show();
            }
            else if(untxt.getText().equals(username) && pdtxt.getText().equals(password)&& "Registra".equals(role)){
                this.hide();
                RegistraMenu rm=new RegistraMenu();
                rm.show();
            }
            else{
                this.hide();
                ManagerMenu mm=new ManagerMenu();
                mm.show();
            }
        }
    }
}

```

Control Structure Example from the Login button implementation-

3.4)Error Handling in the Implementation

```
public EmployeeDao(){  
    try{  
        Class.forName("org.apache.derby.jdbc.ClientDriver").newInstance();  
  
    }catch(Exception ex){  
        System.out.println("Error Loading driver:"+ ex.toString());  
    }  
  
}
```



```
public Employee searchbyid(int id){  
    Connection dbcon;  
    Employee employee=new Employee();  
    try{  
        dbcon=DriverManager.getConnection("jdbc:derby://localhost:1527/XYZE;create=true", "tithi1",  
"TITHI1");  
        Statement stmt =dbcon.createStatement();  
        ResultSet rslt=stmt.executeQuery("Select * from Employee where EmpID="+id+"");  
        while(rslt.next()){  
            employee= new Employee(rslt.getInt("EmpID"),rslt.getString("EmpName"),  
rslt.getString("JobTitle"), rslt.getString("DateofBirth"),rslt.getString("Type"),rslt.getInt("Salary"));  
        }  
  
        dbcon.close();  
  
    }  
    catch(SQLException ex){  
        System.out.println(ex);  
    }  
    return employee;  
}
```

Task 4

4.1-Test Plan


Information Management System of XYA Engineering Firm	
Test Plan ID	01
Brief Description about the Database.	Information System of XYA Company will mainly manage the information regarding Employees, their skills, projects assigned for them, the departments they worked in, and the details about the relationship between vendors and departments.
Introduction to the testing objectives.	<p>This document will mainly describe the plan for testing the Information Management System of XYA company and this document will support the following objectives as well,</p> <ul style="list-style-type: none">• Testing the features of the system.• Recommended Test Requirements.• Describing the recommended test strategies(Approach).• List the deliverables of the test activities.
Testing Items.	Login, main functions of the system and other important logical functions in the system.
Features to be tested.	Login, Insert, Update, Delete, Search, Unique Employee ID, Employee works only in one type of job at a given time, Employee reports only one department, Employee is only assigned for one project
Testing Environment.	PC, Microsoft SQL Server Management Studio 2019, Visual Studio 2019
Testing Approach	Black Box Testing
Resting Tasks	Test Plan, Test Environment, Test Result(Test Case)
Schedule	17 th January 2021, 12.30pm to 7pm

4.2 Test Cases

Test Cases for Login

XYA Information Management System	
TEST CASE	
Test Unit: Admin Login	Tester: Tithira Withanaarachchi
Test Case ID: 01	Test Type: Black Box Testing
Description: Logging in to the Information managements system of XYA by the Admin of the system.	Test Executed by- Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title - Logging to the Information System by Admin.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Enter Valid Credentials.					
02	Perform Validation.	User Name= ADMIN, Password=admin	Entering the main menu for Admin successfully.	Entered the main menu successfully	Pass	


 — □ ×

XYA Engineering Firm Login

User Name

Password

Login


 — □ ×

Admin Menu

Employee	Project	Department
Vendor	Skills	Equipment
Department-Vendor	Employee-Department	Marriage Details
Employee Skills	Assign Project	WorkingProjects
Login Registration	Update Vendor Meeting	Exit

XYA Information Management System	
TEST CASE	
Test Unit: Registrar Login	Tester: Tithira Withanaarachchi
Test Case ID: 02	Test Type: Black Box Testing
Description: Logging in to the Information managements system of XYA by the Registrar.	Test Executed by- Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title - Logging to the Information System by Registrar.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Enter Valid Credentials					
02	Perform Validation.	User Name= REGISTRAR Password=registrar	Entering the main menu for Registrar successfully	Entered the main menu for registrar successfully	Pass	

— □ ×

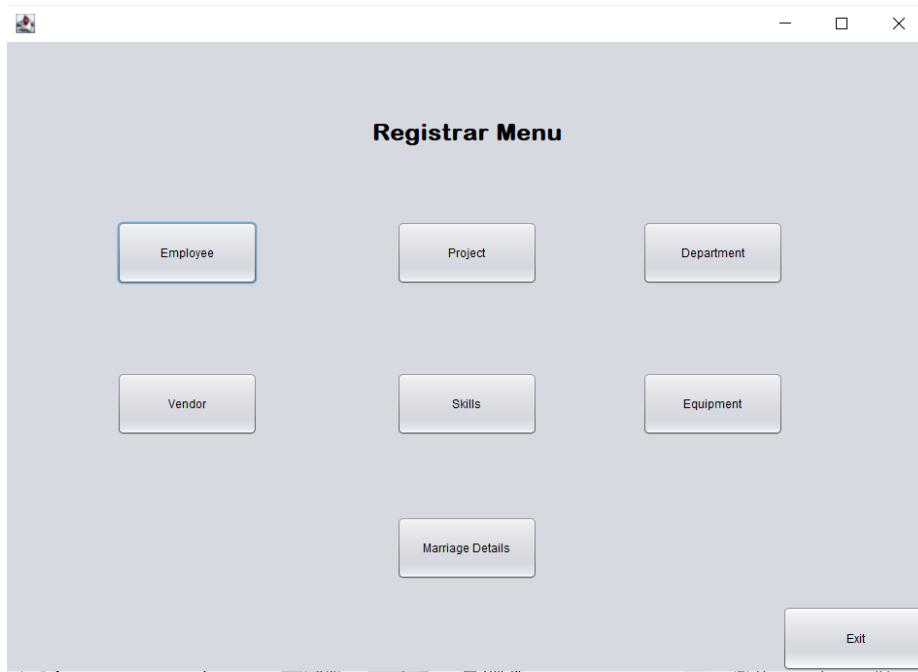
XYA Engineering Firm

Login

User Name

Password

Login



XYA Information Management System	
TEST CASE	
Test Unit: Manager Login	Tester: Tithira Withanaarachchi
Test Case ID: 03	Test Type: Black Box Testing
Description: Logging in to the Information managements system of XYA by the Admin of the system.	Test Executed by- Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title - Logging to the Information System by Manager.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Enter Valid Credentials.					
02	Perform Validation.	User Name=MANAGER, Password=manager	Entering the main menu for manager successfully.	Entered the main menu for Manager	Pass	



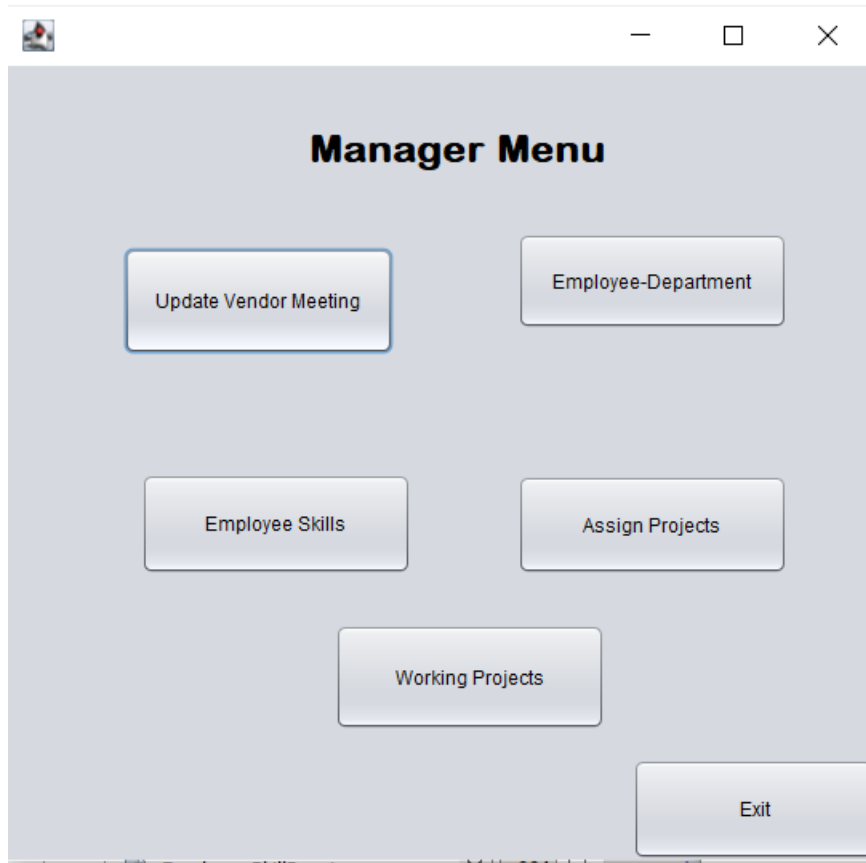
XYA Engineering Firm

Login

User Name

Password

Login



XYA Information Management System	
TEST CASE	
Test Unit: Login	Tester: Tithira Withanaarachchi
Test Case ID: 04	Test Type: Black Box Testing
Description: Not allowing to access the database when invalid credentials are entered.	Test Executed by- Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title – Unsuccessful Login to the Information System.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Enter invalid Credentials.					
02	Perform Validation.	User name=wimal1 , Password=wml1.	Display a “No Login found with the entered credentials”	“No Login found with the entered credentials”	Pass	

User name=wimal1 and password=wml1 are invalid credentials for an admin login.



XYA Engineering Firm

Login

User Name

Password

Login



The image shows a web browser window with a login form for 'XYA Engineering Firm'. The form has two input fields: 'User Name' with the value '123' and 'Password' with masked characters '***'. Below the fields, a message states 'No Login found with the entered credentials'. At the bottom, there is a 'Login' button.

XYA Engineering Firm

Login

User Name

Password

No Login found with the entered credentials

Login

a) Test Cases for crud Operations.

- ❖ Considered the Entity of Employee for the sample test cases for insertion, Search, Update and Deletion of a Record.
- ❖ Testing for other entities also can be done in a similar way to test crud operations related to each entity.

XYA Information Management System	
TEST CASE	
Test Unit: Insert	Tester: Tithira Withanaarachchi
Test Case ID: 05	Test Type: Black Box Testing
Description: Inserting a new record to the Employee table in the Database.	Test Executed by: Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title : Inserting a new record to Employee table .	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Login to the System.					
02	Access the relevant form/interface corresponding to Employee entity.					
03	Insert data.	EmployeeID=1001, Name=KamalAbeyasinghe, Date of Birth=4/6/1990	Display a "Employee Added Successfully" Message.	Display a "Employee Added Successfully" Message.	Pass	

— □ ×

Employee Details

ID

1001

Name

Kamal Abesinghe

Job Title

Software Engineer

Date of Birth

4/6/1990

Type

Full Time(Basic Salary)

Salary

300000

Back

Add

Update

Delete

Search



— □ ×

Employee Details

ID

Name

Job Title

Date of Birth

Type

Full Time(Basic Salary)

Salary

Employee Added Successfully

Back

Add

Update

Delete

Search

XYA Information Management System	
TEST CASE	
Test Unit: Search	Tester: Tithira Withanaarachchi
Test Case ID: 06	Test Type: Black Box Testing
Description: Searching a record in the Employee table in the Database by Employee Number(ID).	Test Executed by: Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title : Searching an employee record by Employee Number.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Login to the System Access the interface related to Employee entity.					
02	Search the record by Employee Number(ID).	Employee ID =1001	Display the data related to the searched record in the relevant text boxes	Searched data displayed in the relevant spaces.	Pass	

—

□

×

Employee Details

ID

1001

Name

Job Title

Date of Birth

Type

Full Time(Basic Salary)

▼

Salary

Back

Add

Update

Delete

Search



—

□

×

Employee Details

ID

1001

Name

Kamal Abeysinghe

Job Title

Software Engineer

Date of Birth

1990-04-06

Type

Full Time(Basic Salary)

▼

Salary

300000

Back

Add

Update

Delete

Search

XYA Information Management System	
TEST CASE	
Test Unit: Update	Tester: Tithira Withanaarachchi
Test Case ID: 07	Test Type: Black Box Testing
Description: Updating a record in the Employee table in the Database.	Test Executed by: Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title : Updating an employee record.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Login to the System Access the interface related to Employee entity.					
02	Search the record that needed to be updated by employee number.					
03	Update the record.		Display a “Employee updated Successsfully” Message.	“Employee updated Successsfully”	Pass	

— □ ×

Employee Details

ID

1001

Name

Kamal Abeysinghe

Job Title

Software Engineer

Date of Birth

1990-04-06

Type

Full Time(Basic Salary)

Salary

400000

Back

Add

Update

Delete

Search



— □ ×

Employee Details

ID

Name

Job Title

Date of Birth

Type

Full Time(Basic Salary)

Salary

Employee Updated Successfully

Back

Add

Update

Delete

Search

XYA Information Management System	
TEST CASE	
Test Unit: Delete	Tester: Tithira Withanaarachchi
Test Case ID: 08	Test Type: Black Box Testing
Description: Deleting a record in the Employee table in the Database by the Employee Number.	Test Executed by: Tithira Withanaarachchi
	Test Execution Date- 17 th January 2021
Title : Deleting an employee record by employee Number.	Test Execution Time-

Step No	Test Steps	Testing Data	Expected Result	Actual Result	Status(Pass/Fail)	Notes
01	Login to the System Access the interface related to Employee entity.					
02	Delete the record by it's Employee Number.	Employee Number =1001	Display a "Employee Deleted Successfully" Message.	"Employee Deleted Successfully"	Pass	

Employee Details

ID

1001

Name

Job Title

Date of Birth

Type

Full Time(Basic Salary)

Salary

Back

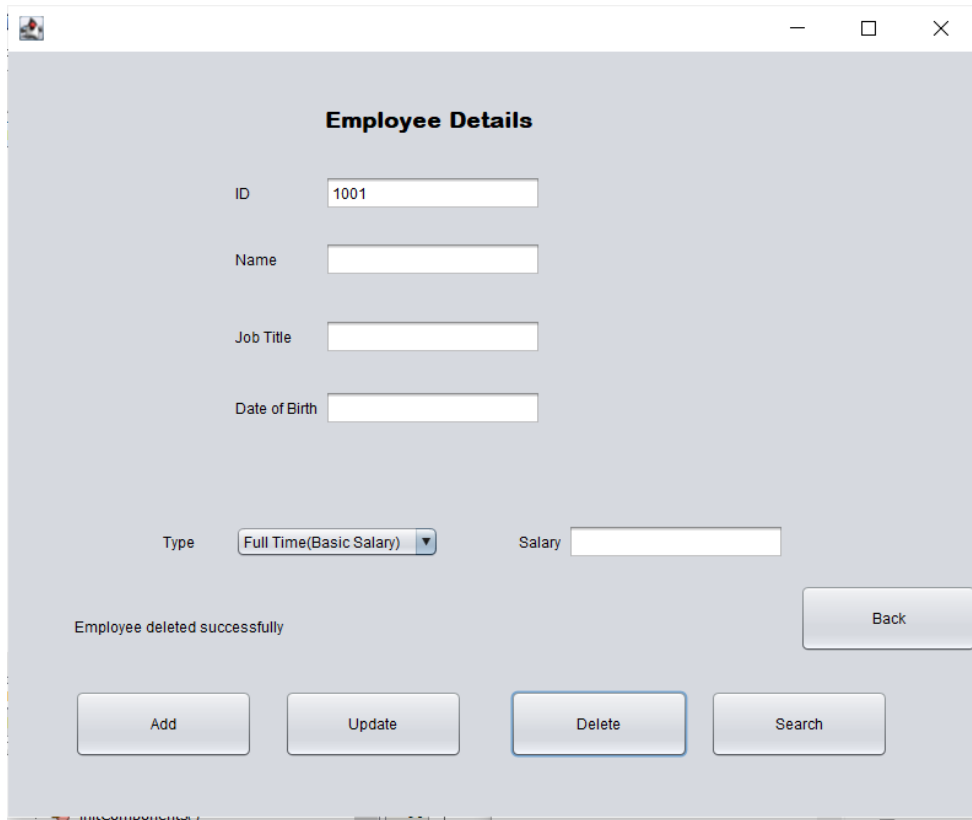
Add

Update

Delete

Search





The image shows a software window titled "Employee Details". It contains several input fields: "ID" with the value "1001", "Name", "Job Title", and "Date of Birth". Below these is a "Type" dropdown menu set to "Full Time(Basic Salary)" and a "Salary" input field. At the bottom, there are four buttons: "Add", "Update", "Delete" (which is highlighted with a blue border), and "Search". A message "Employee deleted successfully" is displayed on the left, and a "Back" button is on the right.

Employee Details

ID

Name

Job Title

Date of Birth

Type Salary

Employee deleted successfully

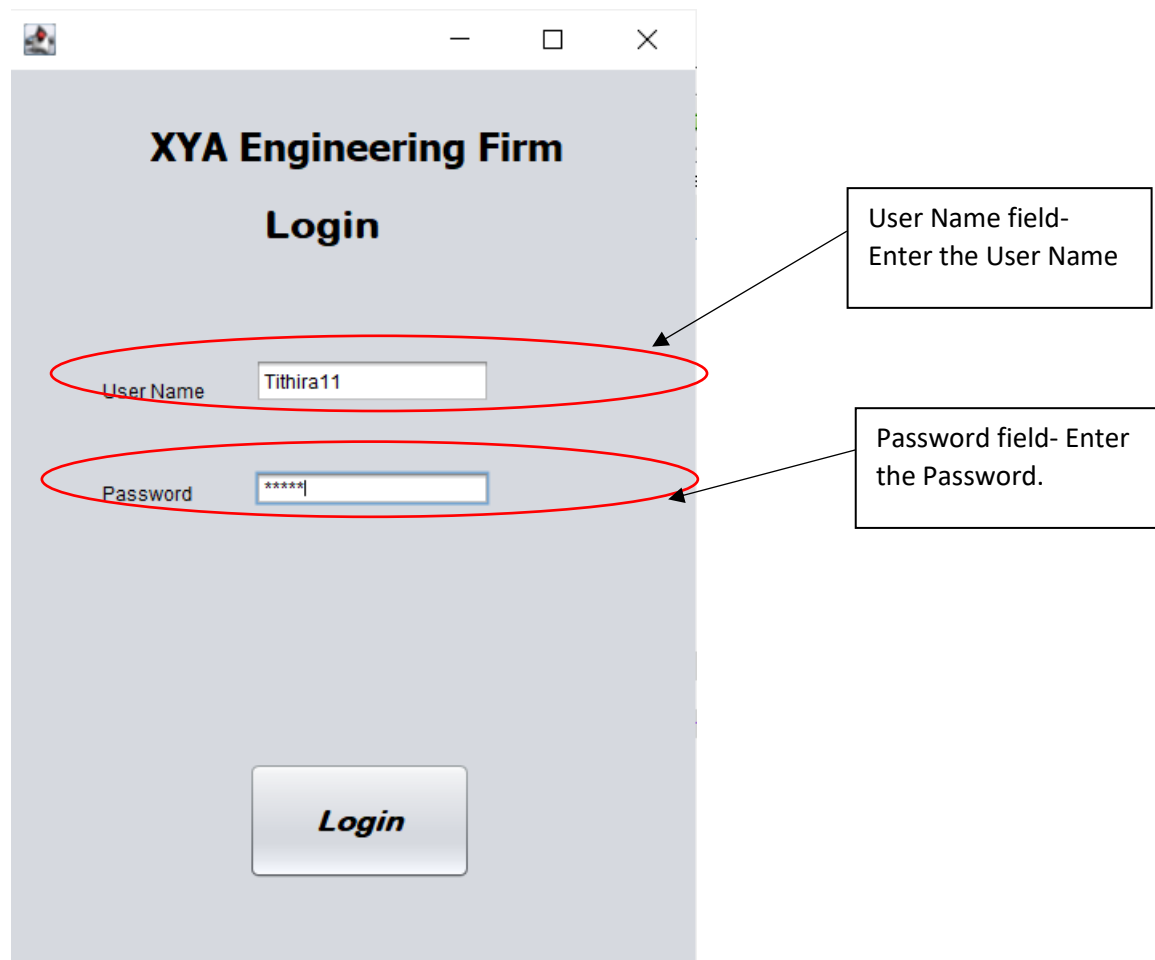
Testing for other entities also can be done in a similar way to test crud operations related to each entity.

4.2) User Manual

User's Guide for XYA Engineering Firm Information Management System.

1)Getting Started.

1.1) Login-



The screenshot shows a login window titled "XYA Engineering Firm Login". The window has a light gray background and a standard Windows-style title bar with minimize, maximize, and close buttons. The login form consists of two input fields: "User Name" and "Password". The "User Name" field contains the text "Tithira11". The "Password" field contains five asterisks "*****". A red oval highlights the "User Name" field, and another red oval highlights the "Password" field. Arrows point from text boxes on the right to these fields. Below the input fields is a "Login" button. The text "User Name" and "Password" are displayed in a light gray font to the left of their respective input fields.

XYA Engineering Firm
Login

User Name

Password

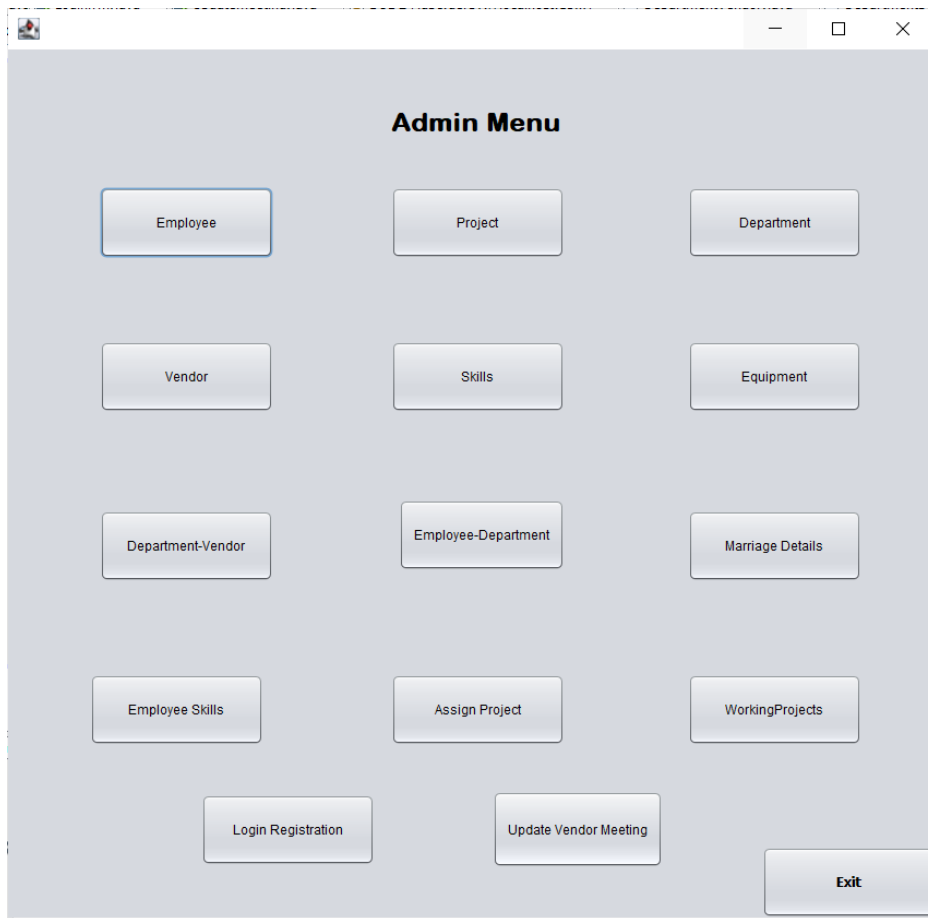
Login

User Name field-
Enter the User Name

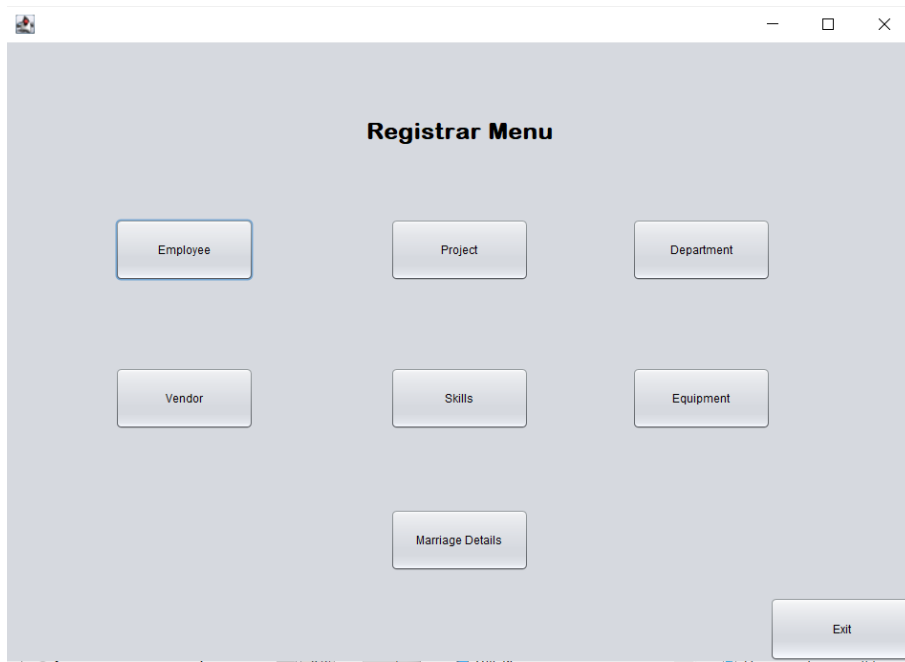
Password field- Enter
the Password.

1.2)Main Menu

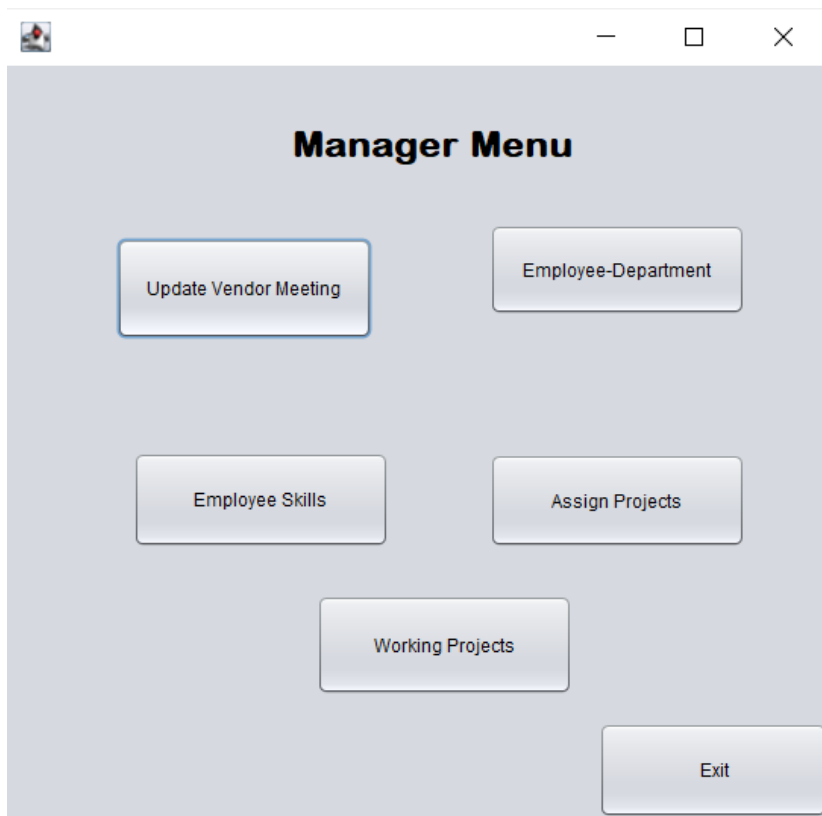
Main Menu for Admin



Main Menu for Registrar-



Main Menu for a Manager-



2.3) Crud Operations in Entities.

Insert-

Data which is needed to be inserted to the database table which related to the Employee entity should be typed in the spaces given by the input fields of the interface.

ID- Integer Type data , which will be the identifier of each and every record of an employee.

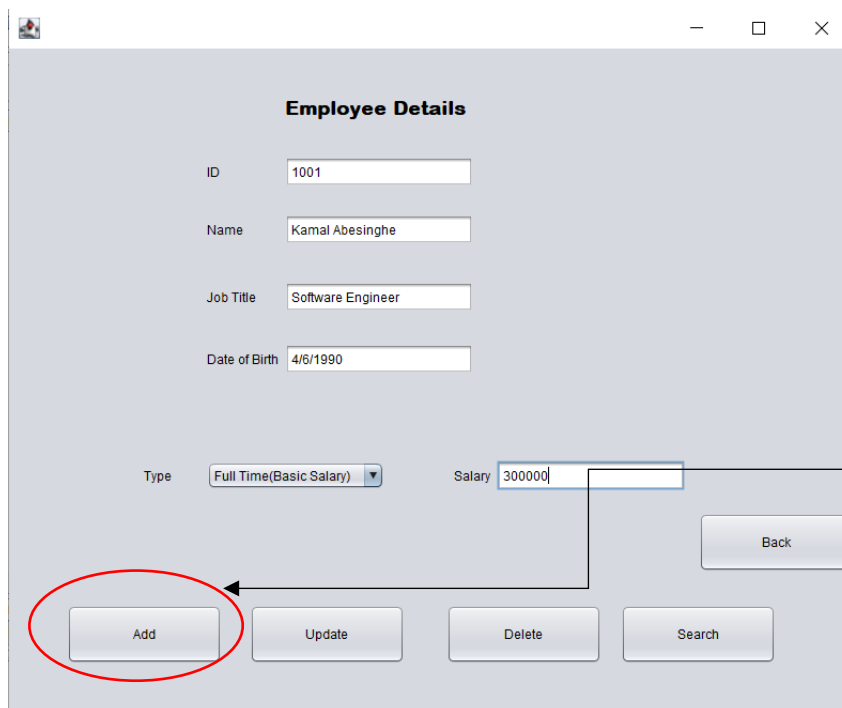
Name-Enter the name of the employee , which contains string type data.

Job Title- Job Title of the particular employee , in string data type.

Date of birth – Date of birth of the Employee should be entered in the provided space in the date structure.

Type- Type of the Employee should be selected by the combo-box provided , stating whether that particular employee is a part- time Employee or a full time Employee.

Salary- Salary of the employee should be provided depending on the type of the employee in intergers.



The screenshot shows a web application window titled "Employee Details". It contains several input fields: ID (1001), Name (Kamal Abesinghe), Job Title (Software Engineer), and Date of Birth (4/6/1990). Below these is a "Type" dropdown menu set to "Full Time(Basic Salary)" and a "Salary" input field containing "300000". At the bottom, there are four buttons: "Add", "Update", "Delete", and "Search". The "Add" button is circled in red. A "Back" button is also present above the "Add" button. A line connects the "Add" button to a text box on the right.

After providing valid data in the spaces provided, user has to click the "Add" Button to insert the new Record.

Employee Details

ID

Name

Job Title

Date of Birth

Type Salary

Employee Added Successfully

Back

Add Update Delete Search

Message indicating that the new record has been added successfully.

Search-

Employee Details

ID

Name

Job Title

Date of Birth

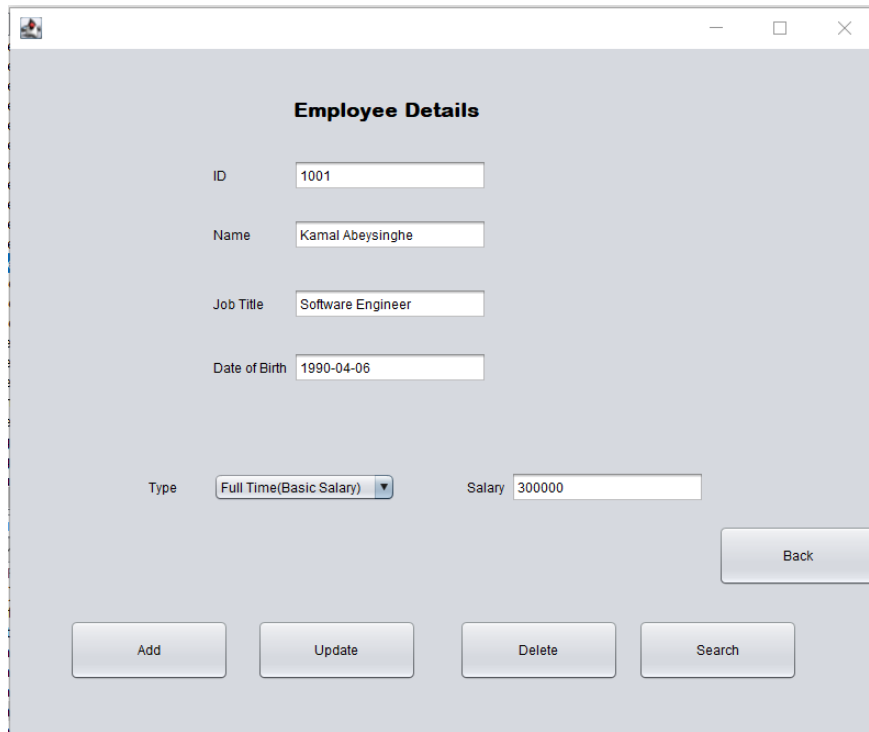
Type Salary

Back

Add Update Delete Search

Insert the Employee ID of the employee which is needed to search information about

Search Result-



Employee Details

ID: 1001

Name: Kamal Abeysinghe

Job Title: Software Engineer

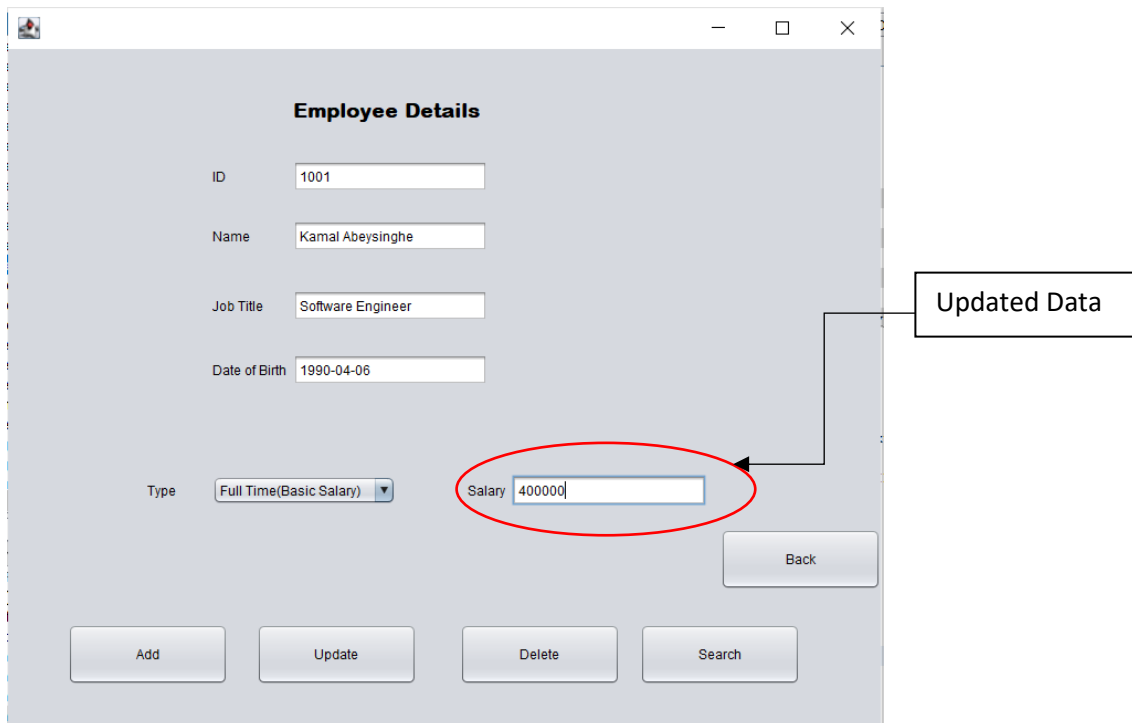
Date of Birth: 1990-04-06

Type: Full Time(Basic Salary) Salary: 300000

Buttons: Add, Update, Delete, Search, Back

Update-

For updating a record, user has to first search the particular data by its ID and then update the record.



Employee Details

ID: 1001

Name: Kamal Abeysinghe

Job Title: Software Engineer

Date of Birth: 1990-04-06

Type: Full Time(Basic Salary) Salary: 400000

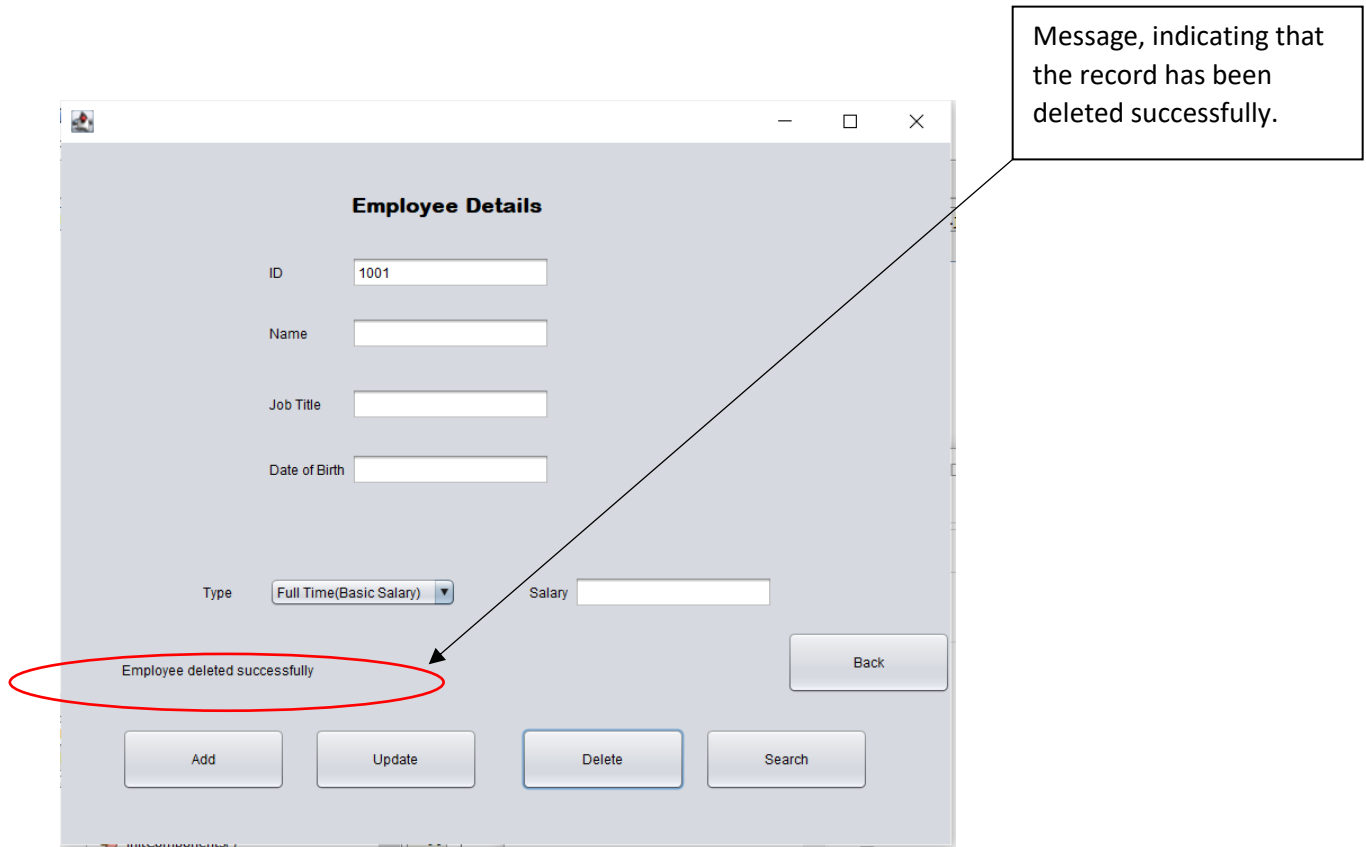
Buttons: Add, Update, Delete, Search, Back

Updated Data

The screenshot shows a web application window titled "Employee Details". It contains several input fields: "ID", "Name", "Job Title", "Date of Birth", "Type" (a dropdown menu currently showing "Full Time(Basic Salary)"), and "Salary". At the bottom, there are four buttons: "Add", "Update", "Delete", and "Search". A message "Employee Updated Successfully" is displayed in the center of the form, enclosed in a red oval. A callout box on the right points to this message with the text: "Message indicating that the record has been updated successfully." The "Update" button at the bottom is also highlighted with a blue border.

Delete-

The screenshot shows the same "Employee Details" form. The "ID" field, which contains the value "1001", is highlighted with a red oval. A callout box on the right points to this field with the text: "Employee ID of the Employee record which the user expects to delete should be entered in the given space for the ID field." The "Delete" button at the bottom is highlighted with a blue border.



All the manipulations related to all other entities should also be done as mentioned above.

The other entities which consist of the the same functionalities from the above explained functions are namely,

- Project Registration,
- Department Registration,
- Vendor Registration,
- Skill Registration,

- Equipment registration,
- Department- vendor,
- Employee-Department,
- Marriage details,
- Employee -Skills,
- Assigning Projects,
- Working On Projects.

4.3 Technical Document

- **General Information-**

1.1 System Overview

Information Management System of XYA Engineering Firm.

- A System based on the Windows Platform.
- Graphically designed interfaces for system notifications.
- Store Data of employees, Projects, Vendors, Departments, Skills of Employees, and the relationship between each of above mentioned entities.
- System name:-Information Management System of XYA Engineering Firm.
- System Code- Java , JavaDB
- System Category:

Major Application: Performs clear-cut functionalities for storing and updating information about all the required entities of the organization.

Authorized User Permission

Information Management System of XYA Engineering Firm provides various resources on this system depending on the type of the user. Among the users, Admin will have the maximum access to the resources of the system. Admin will have the access to,

- Employee Registration,
- Project registration,
- Department registration,
- Vendor Registration,
- Skill Registration,
- Skill registration,

- Equipment Registration,
- Department-Vendor relationship details,
- Marriage Details,
- Employee Skills,
- Assign Projects,
- Working project Details.

For other users such as Manager and the Registrar, the access to functionalities of the system will be limited.

Software requirements-

- Windows 7/8
- Windos10

Database(Relational Database Management System)

- JavaDB

IDE

- Net Beans 8.2

Processor

Intel Core i7(10th gen)

Memmmory

- 4GB Memmmory

Hard Driver

- 1000GB HDD

References

- [1] "Java Point," [Online]. Available: <https://www.javatpoint.com/features-of-java>. [Accessed 18 01 2021].
- [2] "Guru99," [Online]. Available: <https://www.guru99.com/java-virtual-machine-jvm.html>. [Accessed 18 01 2021].
- [3] "JournalDev," [Online]. Available: <https://www.journaldev.com/12496/oops-concepts-java-example>. [Accessed 17 01 2021].
- [4] "Stackify," [Online]. Available: <https://stackify.com/oops-concepts-in-java/>. [Accessed 18 01 2021].
- [5] "Lecture Notes(Sample Document)," 2018.