**Web Architecture and Application Development Laboratory**

**B.Tech. 6th Semester**



**Department: Computer Science and Engineering**

**Faculty of Engineering & Technology**

**M. S. Ramaiah University of Applied Sciences**

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| Faculty | Engineering & Technology |
| Programme | B. Tech. in Computer Science and Engineering |
| Course | Web Architecture and Application Development Laboratory |
| Year/Semester | 2018/6th Semester |
| Course Code | CSL317A |

**Ramaiah University of Applied Sciences**

Private University Established in Karnataka State by Act No. 15 of 2013



List of Experiments

1. Software design
2. Software design
3. Database design
4. PHP form for student registration
5. PHP form for login and dashboard
6. HTML user interface
7. HTML user interface
8. Search implementation
9. Functionality implementation
10. Mock

Consider a scenario where a student enrolls for a course in university. The student also registers in the library available at university by providing his basic details. Consider all the attributes of the student and library to develop the web application design.

# Laboratory 1

Title of the Laboratory Exercise: Software Design

1. Introduction and Purpose of Experiment

Web Application Design.

1. Aim and Objectives

Aim

* To develop Functional and Nonfunctional Requirements, ER diagram, class diagram, interaction sequence diagram and algorithm/flowchart

Objectives

At the end of this lab, the student will be able to

* Model the information required for the given scenario using E-R diagrams
* Develop ER diagram, class diagram, interaction sequence diagram and algorithm/flowchart.

1. Experimental Procedure

Students are given a set of instructions to be executed on the computer. The instructions should be edited and executed and documented by the student in the lab manual. They are expected to answer questions posed in section 5 based on their experiment.

1. Presentation of Results
2. Analysis and Discussions
3. Conclusions
4. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 2

Title of the Laboratory Exercise: Database and PHP forms

Introduction and Purpose of Experiment

Students will learn to validate the user account in the database and provide user details.

1. Aim and Objectives

Aim

Objectives

At the end of this lab, the student will be able to

1. Experimental Procedure

Create a new login page where user can enter his login credentials like username and password. Compare the login credentials with the database to validate user. Display details about the user and other details on html page.

1. Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 3

Title of the Laboratory Exercise: UI development using HTML and CSS

1. Introduction and Purpose of Experiment

Students will learn to use HTML and Javascript in html platform.

1. Aim and Objectives

Aim

To use HTML and Javascript to enhance the user interface for the previously developed user interface

Objectives

At the end of this lab, the student will be able to

1. Experimental Procedure

Update the same web pages already created in the previous labs with css classes and javascript to create new UI components in the html page.

a. Create a program to do Quick Sort in Haskell

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 4

Title of the Laboratory Exercise: UI development using HTML and CSS

1. Introduction and Purpose of Experiment

Students will learn to use CSS and Javascript in html platform.

1. Aim and Objectives

Aim

To use CSS and Javascript to enhance the user interface for the previously developed user interface

Objectives

At the end of this lab, the student will be able to

* Create CSS classes and use it in the UI
* Create Javascript and perform some actions on the developed html page

1. Experimental Procedure

Update the same web pages already created in the previous labs with CSS classes and Javascript to create new UI components in the html page.

a. Find if a given list is palindrome using strings and higher order functions in Haskell

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 5

Title of the Laboratory Exercise: Designing entity classes in UML

1. Introduction and Purpose of Experiment

Students learn to create ER diagram and implement them in MySQL server.

1. Aim and Objectives

Aim

Model the information required for the given scenario using E-R diagrams, implement them in MySQL server and create a simple JDBC based program to create, read, update and delete data from the database.

Objectives

At the end of this lab, the student will be able to

* Model information using relational data modelling
* Translate relational model to a class diagram
* Create queries in SQL
* Create programs that can access databases using SQL

1. Experimental Procedure

Develop ER diagram for the given scenario and also create database for the same. Use JDBC to update the database and try some operations.

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 6

Title of the Laboratory Exercise: Java Persistence API for database

1. Introduction and Purpose of Experiment

Students use java persistence API to create java application to access database to create, read, update and delete data.

1. Aim and Objectives.

Aim

To auto generate a java application that can access database to create, read, update and delete data.

Objectives

At the end of this lab, the student will be able to

* Create entity classes
* Link a data base with Java enterprise application using JPA
* Create object queries

1. Experimental Procedure

Use JPA to link to the database created for the scenario and perform create, read, update and delete operation on the database.

a. Write a program to develop a game for the scenario posed using Greenfoot IDE

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 7

Title of the Laboratory Exercise: Service Development: JAX-RS Web Services

1. Introduction and Purpose of Experiment

Students learnt to develop restful web services for the given scenario.

1. Aim and Objectives

Aim

Design and implement the Business Logic for the given scenario using JAX-RS services.

Objectives

At the end of this lab, the student will be able to

* Create resource procedure based web services
* Integrate business logic with resource model
* Implement data validation and exception handling in JAX-RS

1. Experimental Procedure

Use the developed database and auto generate restful web services to show some business logic for the given scenario.

a. Write a program to develop a game for the scenario posed:

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 8

Title of the Laboratory Exercise: Service Development: JAX-RS Web Services

1. Introduction and Purpose of Experiment

Students learnt to develop restful web services for the given scenario.

2. Aim and Objectives

Aim

Design and implement the Business Logic for the given scenario using JAX-RS services.

3. Objectives

At the end of this lab, the student will be able to

* Create resource procedure based web services
* Integrate business logic with resource model
* Implement data validation and exception handling in JAX-RS

4. Experimental Procedure

Use the developed database and auto generate restful web services to show some business logic for the given scenario.

5. Calculations/Computations/Algorithms

6. Presentation of Results

7. Analysis and Discussions

8. Conclusions

9. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 9

Title of the Laboratory Exercise: HTML/AJAX Interface for REST Services

1. Introduction and Purpose of Experiment

Students use the already created web services and develop html user interface.

1. Aim and Objectives

Aim

Implement the user interface for the JAX-RS services developed in previous lab using HTML

1. At the end of this lab, the student will be able to

* Implement HTML based declarative user interfaces
* Invoke Web services using JS scripts
* Implement exception handling and reporting in JS logic

1. Experimental Procedure

Use the developed web services and auto generate html client for the same. Develop different UI component in html for the web pages generated.

a. Create a simple calculator using FXML in Java. Include exception handling logic that reports exceptions such as divide by zero in human readable pop-up messages.

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |

# Laboratory 10

Title of the Laboratory Exercise: HTML/AJAX Interface for REST Services

1. Introduction and Purpose of Experiment

Students use the already created web services and develop html user interface.

1. Aim and Objectives

Aim

Implement the user interface for the JAX-RS services developed in previous lab using HTML

1. At the end of this lab, the student will be able to

* Implement HTML based declarative user interfaces
* Invoke Web services using JS scripts
* Implement exception handling and reporting in JS logic

1. Experimental Procedure

Use the developed web services and auto generate html client for the same. Develop different UI component in html for the web pages generated.

a. Create a simple calculator using FXML in Java. Include exception handling logic that reports exceptions such as divide by zero in human readable pop-up messages.

1. Calculations/Computations/Algorithms
2. Presentation of Results
3. Analysis and Discussions
4. Conclusions
5. Comments

a. Limitations of Experiments

b. Limitations of Results

c. Learning happened

d. Recommendations

|  |  |  |
| --- | --- | --- |
| ****Component**** | ****Max Marks**** | ****Marks Obtained**** |
| **Viva** | **6** |  |
| **Results** | **7** |  |
| **Documentation** | **7** |  |
| ****Total**** | ****20**** |  |