PUNE INSTITUTE OF COMPUTER TECHNOLOGY

DHANKAWADI, PUNE – 43.

# LIST OF LAB EXPERIMENTS

ACADEMIC YEAR: 2016-2017

**DEPARTMENT:** COMPUTER ENGINEERING **Date: 15/12/2016**

**CLASS:** B.E **SEMESTER:** II

**SUBJECT:** Computer Laboratory III

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| **Expt.No.** | **PROBLEM STATEMENT** |
|  | **Group A Assignments (Mandatory)** |
| **1.** | Use Divide and Conquer Strategies and object-oriented software design technique using Modelio to design software function for Binary Search for an un-ordered data stored in memory.  Use necessary USE-CASE diagrams and justify its use with the help of mathematical modeling and related efficiency such as space and time complexity. Give the design with class and sequence diagrams.  Implement the design using Eclipse C++ or Python. |
| **2.** | Using Divide and Conquer Strategies to design an efficient class for Concurrent Quick Sort and the input data is stored using XML.  Use object oriented software design method and Modelio.  Perform the efficiency comparison with any two software design methods. Use necessary USE-CASE diagrams and justify its use with the help of mathematical modeling. Give the design with class and sequence diagrams.  Implement the design using Scala/Python/Java/C++. |
| **3.** | A Web Tool for Booth's multiplication algorithm is used to multiply two numbers located in distributed environment.  Use software design client-server architecture and principles for dynamic programming. Give the design with use case, class, sequence and deployment diagrams.  Implement the design using HTML5/Scala/Python/Java/C++/ Rubi on Rails..  Perform 1) Risk Analysis. 2) Positive and Negative testing.  Use latest open source software modeling and testing tool such as Modelio, Junit, Selenium. |
| **4.** | In an embedded system application Dining Philosopher's problem algorithm is used to design software that uses shared memory between neighboring processes to consume the data. The Data is generated by different Sensors/WSN system Network and stored in MongoDB (NoSQL).  Implementation be done using Scala/ Python/ C++/ Java.  Design using Client-Server architecture. Perform Reliability Testing. Give the design with use case, class, sequence and deployment diagrams.  Use latest open source software modeling and testing tool- Modelio, MongoDB, Junit/NOSQLUnit. |
| **5.** | Design, Implement and Test Mobile Application for Calculator having trigonometry functionality.  The data storage uses 1.text files, 2. XML.  Use latest open source software modeling and testing tool/Scrum-it.  Implement the design using HTML-5/Scala/ Python/Java/C++/Rubi on Rails. Give the design with use case, class, sequence and deployment diagrams.  Perform Positive and Negative testing. Use Android toolkit, Selenium. |
| **6.** Elective-III A | Write a mobile application to fetch all audio files and, play the audio file when user clicks on any audio file from list view. Create Mobile GUI using Python/ Scala/ Java/ HTMK5/ Android.  Give the design with use case, class, sequence and deployment diagrams. |
| **6.** Elective-III B | Create a web based e-Health Application for online appointments for the medical practitioner or hospital.  Give the design with use case, class, sequence and deployment diagrams. Test with Selenium. |
| **6.** Elective-III C | Install following any one Cloud Simulators/Tools : CloudSim, CloudAnalyst, GreenCloud/Docker, iCanCloud/IBM Smart Cloud, GDCSim/SPECI, MDCSim/ NetworkCloudSim.  Assignment : Simulate the following.   1. Create a datacenter with one host and run one cloudlet on it using CloudSim. 2. Create and Configure the data center and user base to show response time, request servicing time and data center loading 3. Install the client to launch the application running in the container using docker images.   Give the design with deployment diagram. |
| **6.** Elective-III D | Write a program in python/ Java/ Scala/ C++/ HTML5 to implement password data encryption. Use encryption method overloading (any two methods studied) Give the design with use case, class and sequence diagrams. |
|  | **Group B**  **( Mandatory assignments: 1,2,3)** |
| **1.** | 8-Queens Matrix is Stored using JSON/XML having first Queen placed. Use back-tracking to place remaining Queens to generate final 8-queen's Matrix.  Use suitable Software modeling, Design and testing methods. Justify the selection over other methods. |
| **2.** | Write a web application using Scala/ Python/ Java /HTML5 to check the plagiarism in the given text paragraph written/ copied in the text box.  Give software Modeling with UML using Analysis Modeling (Static Modeling, Object Structuring, Dynamic Modeling). and give Test cases for the same. Use Modelio and Selenium. |
| **3.** | A mobile application needs to be designed for using a Calculator (+, - ,\*, /, Sin, Cos, sq-root) with Memory Save/Recall using Extended precision floating point number format.  Give the Required modeling, Design and Positive-Negative test cases. |
| **4.** | Write a web application using Scala/ Python/ Java /HTML5 to check the plagiarism in the given text paragraph written/ copied in the text box.  Give software Modeling, Design, UML and Test cases for the same using COMET(Concurrent Object Oriented Modeling and Architectural Design Method). |
| **5.** | A Web application for Concurrent implementation of ODD-EVEN SORT is to be designed using Realtime Object Oriented Modeling(ROOM).  Give the necessary design diagrams and write the test cases for the white box testing. Draw Concurrent collaboration Diagrams. |
| **6.** | 8-Queens Matrix is Stored using JSON/XML having first Queen placed. Use back-tracking to place remaining Queens to generate final 8-queen's Matrix using Python. |
|  | **ELECTIVE III**  **(Mandatory Assignments A1, A2, A3)** |
| **A1.** | Write a web application using Scala/ Python/ Java /HTML5 to check the plagiarism in the given text.  The required dataset must be available to the application to the logged-in mobile device. The database is maintained in NoSQL.  Give the design with use case, class, sequence and deployment diagrams. Test with Selenium. |
| **A2.** | Write a mobile application for uploading and downloading the files on server. The Server can also be from Cloud platform.  Give the design with use case, class, sequence and deployment diagrams. |
| **A3.** | Create a Menu based application for mobile devices which can do all the activities for Human resource management.  management like  a. Employee attendance  b. Employee notices  c. Payroll Systems  Give the design with use case, class, sequence and deployment diagrams. |
| **A4.** | Write a mobile application to fetch images from the sdcard. Also provide the facility of deleting, renaming the images. |
| **A5.** | Write a mobile application for Configuring mobile as  a. HOTSPOT Device  b. Sharing files through Bluetooth  c. Messaging to other mobile for inviting to play a game  For playing TiC-TaC-ToY Game. Use J2ME/ Python/ Scala/Android for programming |
|  | **ELECTIVE III**  **(Mandatory Assignments B1, B2, B3)** |
| **B1.** | Create a video web chat server with text messaging option. Detect the web cam attached to devices like computer/mobile phone.  Give the design with use case, class, sequence and deployment diagrams. Test with Selenium. |
| **B2.** | Create a simple web services for  a. Calculator (+, - ,\*, /, Sin, Cos, sq-root) with Memory Save/Recall using Extended precision floating point number format.  b. Currency Converter or Unit Converters  Use object oriented programming using HTML5/ Pythom/ Java/ Scala  Give the design with use case, class, sequence and deployment diagrams. Test with Selenium. |
| **B3.** | Create a web page for online registration of the international seminar. The participants can be students, faculty members, professional, and company / firm representatives from different countries. The registration fees should be accepted either in rupees or dollar or Pounds or Euros. The payment can be made by credit card, debit card or demand draft. The participants should give choice for accommodation for provided four hotels with services (minimum five other than basic services) required. Use object oriented programming to create the web page with required form elements and default values. The form should provide the controls for the information to accept above mentioned details as well as for personal and other relevant information.  Use JSP/ HTML5/ Scala/ Python along with Database connectivity.Give the design with use case, class, sequence and deployment diagrams. Test with Selenium. |
| **B4.** | Write a web application using Scala/ Python/ Java /HTML5 to check the plagiarism in the given text.The required data-set must be available to the application to the logged-in IoT device. |
| **B5.** | Concurrent implementation of ODD-EVEN SORT is to be implemented as a web application using HTML5/ Scala/ Python/ Java. Write a debugger to test the performance of White-box testing. |
|  | **ELECTIVE III**  **(Mandatory Assignments C1, C2, C3)** |
| **C1.** | Demonstrate the use of following PaaS tools: Cloud Foundry / GoogleApp Engine/ OpenShift with a database application. |
| **C2.** | Execute at least three command related to the Storage organization of the cloud; Create necessary GUI using Python. |
| **C3.** | Create a VM depending on the user requirements. |
| **C4.** | Perform an assignment using Xen Hypervisor or equivalent open source to configure it. Give necessary GUI. |
| **C5.** | Write a program to create a bucket in an installed cloud. |
|  | **ELECTIVE III**  **(Mandatory Assignments D1, D2 , D3)** |
| **D1.** | A message is to be transmitted using network resources from one machine to another calculate and demonstrate the use of a Hash value equivalent to SHA-1. Develop program in C++/Python/Scala/Javausing Eclipse. |
| **D2.** | Write a program to generate a pseudorandom number generator for generating the long-term private key and the ephemeral keys used for each signing based on SHA-1 using Python/Java/C++.  Disregard the use of existing pseudorandom number generators available. |
| **D3.** | Write a program to produce a DSA signature using parameter tuple<p,q,g>, long term key pair and a message digest. |
| **D4.** | Write a Python/ Java program to validate the parameter tuple for the security of the DSA. Design necessary classes. Use Miller-Rabin primality testing may be used. |
| **D5.** | Write a program in Python/ Java/ C++ /Scala using Eclipse to Start/Stop the IDS, View current traffic,View blocked list (IP, Domains), view current firewall rules and unblock users. Create Necessary GUI. |
|  | **GROUP C**  **(any one assignment)** |
| **1.** | Installation of Open source Cloud Infrastructure Opennimbus/ Openstack / Eucalyptus/ Openebula |
| **2.** | Install and Use Latest IDS (Open Source). |

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**Subject Co-ordinator Head of Department**

**(Mrs.A.R. Deshpande) Computer Engineering**