PUNE INSTITUTE OF COMPUTER TECHNOLOGY

DHANKAWADI, PUNE –43

# **LIST OF LAB EXPERIMENTS**

**ACADEMIC YEAR: 2016- 2017**

DEPARTMENT: **COMPUTER ENGG** DATE: **13/06/2016**

CLASS: **B.E**  SEMESTER: **I**

SUBJECT: **Computer Laboratory - I**

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| **LAB**  **Expt. No.** | **PROBLEM STATEMENT** |
| **Group A Assignments (Mandatory)** |
|  | Using Divide and Conquer Strategies design a function for Binary Search using C++/Java/Python/Scala. |
|  | Using Divide and Conquer Strategies design a class for Concurrent Quick Sort using C++. |
|  | Lexical analyzer for sample language using LEX. |
|  | Parser for sample language using YACC. |
|  | Intermediate code generation for sample language using LEX and YACC. |
|  | A6 :Based on Elective-I (Appendix I) |
| **Group B Assignments (At least 6) (3 from Elective-I).** | |
|  | 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. |
|  | Concurrent Implementation of travelling salesman problem. |
|  | Implementation of 0-1 knapsack problem using branch and bound approach. |
|  | Code optimization using DAG. |
|  | Code generation using DAG / labeled tree. |
|  | Generating abstract syntax tree using LEX and YACC. |
|  | Implementing recursive descent parser for sample language |
|  | Write a program to implement SLR Parsing algorithm using Python for the ordered input Set in XML { P→ E, E→E+T, E→T, T→T\*F, T→F, F→(E), F→i } |
|  | B9: Based on Elective-I (Appendix I) |
|  | B10: Based on Elective-I (Appendix I) |
|  | B11: Based on Elective-I (Appendix I) |
|  | B12: Based on Elective-I (Appendix I) |
|  | B13: Based on Elective-I (Appendix I) |
| **Group C (At least One)** | |
|  | Code generation using “iburg” tool. |
|  | Cross compilation using XMLVM. |
|  | Generate Huffman codes for a gray scale 8 bit image. |
|  | Simulate JPEG like compression on a grayscale image and report the compression Ratio |

**Appendix I:**

**Group A:**

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| --- | --- | --- |
| **Sr. No** | **Elective-I**  **Subject** | **Problem Statement** |
| **A6** | **IP** | Design a class using C++ to read a gray scale TIFF image file of a dental digital X-Ray or Medical X-Ray or an Areal view Image, design Class to calculate histogram to return a CList, Design ImageDisplay class to display historam of a image. |
| **CNDM** | A company has three offices at remote locations with requirement of interoperability with remote services. Each office has a server, TCP/IP and different users including administrator, privileged users and common clients. Design a network model for the same. Demonstrate the network model using NS3. |
| **ACP** | Write a java program to multiply 64-bit numbers using shared memory, java collection framework and java utilities. |
| **DMTA** | Implement a simple approach for k-means/ k-medoids clustering using C++. |

**Group B:**

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| **Sr. No** | **Elective-I**  **Subject** | **Problem Statement** |
| **B9** | **IP** | Implement histogram equalization without the use of FOSS Eclipse-OpenCV library functions and compare its performance to OpenCV library function with Eclipse. |
| **CNDM** | Write a program in python to calculate end-to-end packet delay for ethernet, 802.11 and 802.15.4 and compare the results. End-to-end packet delay should include processing delay, queuing delay, transmission delay and propagation delay. |
| **ACP** | For a text message of 150 words, Huffman Codes are to be produced and transmitted through a messaging system or a blog. Use Python or Java Script/Java Beans to transfer such message from one user to another on a web/intranet. |
| **DMTA** | Using any similarity based techniques develop an application to classify text data. Perform pre-processing tasks as per requirement. |
| **B10** | **IP** | Implement adaptive thresholding of a gray scale image and compare its performance with ordinary thresholding |
| **CNDM** | Write a program in Java to analyze M/D/1 (Random Arrivals, constant service time distribution and 1 server) for data wireless networks and calculate channel utilization and throughput. |
| **ACP** | For a text message of 150 words, Huffman Codes are to be produced and transmitted through a messaging system or a blog. Use Python or Java Script/Java Beans/Scala to transfer such message from one user to another on a web/intranet, Develop a mobile APP. |
| **DMTA** | Implement Apriori approach for data mining to organize the data items on a shelf using following table of items purchased in a Mall |
| **B11** | **IP** | Perform a two dimensional Butterworth low-pass and high-pass filter of the given image for two different cut-off frequencies. |
| **CNDM** | Write a program using Embedded Java to find CMST using Esau-Williams Algorithm use wireless networks. |
| **ACP** | Write a program using Sqoop to transfer the Digital Library Book Data and related linked to multimedia/PDF files stored using MySQL to HDFS and from HDFS to MySQL. |
| **DMTA** | Implement Decision trees on Digital Library Data to mirror more titles(PDF) in the library application, compare it with Na ̈ Bayes algorithm. |
| **B12** | **IP** | Perform Image segmentation using watershed /fuzzy/clustering segmentation technique. |
| **CNDM** | For wireless routing, design and compare distributed Bellman-Ford algorithm and Dijkstra’s algorithm use FOSS Eclipse C++/ Java/ Python/ Scala for programming. |
| **ACP** | Write a program using Hive to create a summarization and data analysis queries on the Digital Library Book Data. |
| **DMTA** | Implement Naïve Bayes for Concurrent/Distributed application. Approach should handle categorical and continuous data. |
| **B13** | **IP** | Perform any two boundary/region based feature extraction techniques for object recognition. |
| **CNDM** | The class rooms and laboratories are connected through a distributed network having ’n’ nodes with security cameras (IP-based) along with the other sensors such as thumb marks of attendance. Design a network for your college for security management and attendance management. The departments are connected in a bipartite graph and Heads are connected to the administrative offices of the college. Design a network and test it the efficient data handling by different entities. Develop a model to demonstrate Dijkstra’s algorithm for sampling the data. Use Python and NS3. |
| **ACP** | Write a MapReduce program using Java/Python/Scala to arrange the data on userid, then with in the user id sort them in increasing or decreasing order of hit count of accession number demanded by students using digital library. |
| **DMTA** | Implementation of K-NN approach, take suitable example. |

Subject Coordinator Head of Department (Mrs. Pujashree Vidap) (Department of Computer Engg.)