PUNE INSTITUTE OF COMPUTER TECHNOLOGT, PUNE
ACADEMIC YEAR: 2019-2020

LIST OF LAB EXPERIMENTS

Date: 03/6/2019

DEPARTMENT: Computer Engineering

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

SUBJECT: Lab Practice II

LAB EXPT.NO	PROBLEM STATEMENT
410244(D): Data Mining and Warehousing	
1	For an organization of your choice, choose a set of business processes. Design star / snow flake schemas for analyzing these processes. Create a fact constellation schema by combining them. Extract data from different data sources, apply suitable transformations and load into destination tables using an ETL tool. **For Example:** Business Origination: Sales, Order, Marketing Process.
2	Consider a suitable dataset. For clustering of data instances in different groups, apply different clustering techniques (minimum 2). Visualize the clusters using suitable tool.
3	Apply a-priori algorithm to find frequently occurring items from given data and generate strong association rules using support and confidence thresholds. **For Example:** Market Basket Analysis
4	Consider a suitable text dataset. Remove stop words, apply stemming and feature selection techniques to represent documents as vectors. Classify documents and evaluate precision, recall.
5	**Mini project on classification:** Consider a labeled dataset belonging to an application domain. Apply suitable data preprocessing steps such as handling of null values, data reduction, discretization. For prediction of class labels of given data instances, build classifier models using different techniques (minimum 3), analyze the confusion matrix and compare these models. Also apply cross validation while preparing the training and testing datasets. **For Example:** Health Care Domain for predicting disease
410245: Elective II **410245(A): Distributed Systems**	
1	Design and develop a basic prototype distributed system (e.g. a DFS).
2	Design and implement client server application using RPC/ RMI mechanism (Java).
3	Design and implement a clock synchronization algorithm for prototype DS.

<table>
<tr><td>4</td><td>Implement Ring or Bully election algorithm for prototype DS.</td></tr>
<tr><td>5</td><td>Implement Ricart Agrawala‟s distributed algorithm for mutual exclusion.</td></tr>
<tr><td>6</td><td>Problem solving of Wait-die and Wait –wound scheme for deadlock prevention.</td></tr>
<tr><td>7</td><td>Simulate Wait for Graph based Centralized or Hierarchical or Distributed algorithm for deadlock detection.</td></tr>
<tr><td>8</td><td>Implementation of 2PC / Byzantine Generals Problem.</td></tr>
<tr><td>9</td><td>Mini-Project
Design, implement, and thoroughly test a distributed system, implementing - Shared document editing, in the style of Google docs. The system should support real-time editing and viewing by multiple participants. Multiple replicas would be maintained for fault tolerance. Caching and/or copy migration would be useful to minimize application response time.</td></tr>
<tr><td colspan="2">410245(B): Software Testing and Quality Assurance</td></tr>
<tr><td>1</td><td>Mini-Project 1: Create a Medical Healthcare System by selecting relevant system environment / platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Prepare Test Cases inclusive of Test Procedures for identified Test Scenarios. Perform selective Black-box and White-box testing covering Unit and Integration test by using suitable Testing tools. Prepare Test Reports based on Test Pass/Fail Criteria and judge the acceptance of application developed.</td></tr>
<tr><td>2</td><td>Mini-Project 2: Create a small web-based application by selecting relevant system environment / platform and programming languages. Narrate concise Test Plan consisting features to be tested and bug taxonomy. Narrate scripts in order to perform regression tests. Identify the bugs using Selenium WebDriver and IDEand generate test reports encompassing exploratory testing.</td></tr>
<tr><td colspan="2">410245(C):: Operation Research</td></tr>
<tr><td>1</td><td>The Transportation Problem:
Milk in a milk shed area is collected on three routes A, B and C. There are four chilling centers P, Q, R and S where milk is kept before transporting it to a milk plant. Each route is able to supply on an average one thousand liters of milk per day. The supply of milk on routes A, B and C are 150, 160 and 90 thousand liters respectively. Daily capacity in thousand liters of chilling centers is 140, 120, 90 and 50 respectively. The cost of transporting 1000 liters of milk from each route (source) to each chilling center (destination) differs according to the distance. These costs (in Rs.) are shown in the following table
<table>
<tr><th rowspan="2">Routes</th><th colspan="4">Chilling Centers</th></tr>
<tr><th>P</th><th>Q</th><th>R</th><th>S</th></tr>
<tr><td>A</td><td>16</td><td>18</td><td>21</td><td>12</td></tr>
<tr><td>B</td><td>17</td><td>19</td><td>14</td><td>13</td></tr>
<tr><td>C</td><td>32</td><td>11</td><td>15</td><td>10</td></tr>
</table>
The problem is to determine how many thousand liters of milk is to be transported from each route on daily basis in order to minimize the total cost of transportation.</td></tr>
<tr><td>2</td><td>Investment Problem:
A portfolio manager with a fixed budget of $100 million is considering the eight</td></tr>
</table>

investment opportunities shown in Table 1. The manager must choose an investment level for each alternative ranging from $0 to $40 million. Although an acceptable investment may assume any value within the range, we discretize the permissible allocations to intervals of $10 million to facilitate the modeling. This restriction is important to what follows. For convenience we define a unit of investment to be $10 million. In these terms, the budget is 10 and the amounts to invest are the integers in the range from 0 to 4. Following table provides the net annual returns from the investment opportunities expressed in millions of dollars. A ninth opportunity, not shown in the table, is available for funds left over from the first eight investments. The return is 5% per year for the amount invested, or equivalently, $0.5 million for each $10 million invested. The manager's goal is to maximize the total annual return without exceeding the budget.

Return from Investment Opportiunities

Amount	**Opportunities**							
Invested($10 million)	1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0	0
1	4.1	1.8	1.5	2.2	1.3	4.2	2.2	1.0
2	5.8	3.0	2.5	3.8	2.4	5.9	3.5	1.7
3	6.5	3.9	3.3	4.8	3.2	6.6	4.2	2.3
4	6.8	4.5	3.8	5.5.	3.9	6.8	4.6	2.8

Prof. P.P.Joshi
Subject Coordinator

HOCD
Head, Department of Computer Engg.