Algorithms and Data Structures for Big Data Systems Lab

Program: Big Data Analytics **Date: October 4, 2023**

Time: 120 minutes **Max Marks: 30**

Q1 - Book My-Table

Develop an application for restaurant chair booking system. Restaurant has 5 number of 2 chair table, 10 number of 4 chair table and 5 number of 6 chair table. Single customer is allocated only 2 chair table. 2 0r 3 person group can be allotted 4 chair table. If tables are full, customers will be put in "waiting" data structure. When table/s become free, customers will be removed from "waiting" data structure and table/s is allotted. Design suitable data structures which covers all requirements. Provide following functions.

Allot table to customers. If tables are not free, should be placed in waiting.

Remove customer from table after food. Removal of customer need not be on the basis of FIFO.

Q2 - AB-5 Super Store

Develop data analysis application for consumer goods shop. Customer buy any number of items (item with any number of quantities). Purchased items are stored in suitable data structure. Items are identified by item code. Implement the following.

Add items with required quantities.

Number unique items sold.

Which items are fast moving items (more number of transactions).

Slow moving items (less number of transactions).

Given item code, find number of quantities sold.

Q3 - Dhana Laxmi Trading Company

Develop an application to keep track of share transaction of individual customer. At any time customer can't have more than 5 company shares. Data need to be stored are share name (like 'A', 'B' etc) purchase price and number units bought. To purchase new share, if already 5 shares are present, oldest share is to be sold. While selling, current price of share has to be specified. Provide functions for purchasing share, selling share and make_estimation(). make_estimation() returns numeric value which is the difference between purchase and selling price of all shares in hand.

Q4 – “Turtle” High-speed Fast Tag

Develop an application for vehicle toll collection. First, vehicles should be registered with Fast Tag company. Data need to be provided during registration are, vehicle number (string), vehicle type (like car, LCV, Bus etc), amount in valet, two-way code. Two-way code can take 0 or 1. 0 indicates collected toll for one-way only. If two-way code is set 1, toll for return journey should not be collected and 1.8 times toll fare should be applied. After return journey two-way code should be reset to 0.Toll charges (one way) for car is 40, LCV is 70, Bus is 150. No toll for two wheelers. No entry to vehicle if valet amount is less than toll charges. Provide function to recharge valet based on vehicle number.