MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING (CSE)
CSE 216: Data Structure and Algorithm II Sessional
Lab Practice-01, DATE: 04/12/2024

TOTAL MARKS: 10 **TIME: 45 mins**

Restaurant Bill Payment with Priority Queue

Problem Statement: In a restaurant, bills are processed with the highest priority based on the total amount. The higher the bill amount, the higher its priority. However, to avoid starvation (e.g., small bills being delayed indefinitely), the customer with the minimum bill will be processed after processing 2 customers.
Note that the maximum number of customers will not exceed 99.

Basic Operation:
Insert (Enqueue): Add a new bill to the queue.
Remove Max (Dequeue): Retrieve and remove the bill with the highest priority.
Peek: View the highest-priority bill without removing it.
Update: Modify a bill's amount.
Find Min: Find the index of the minimum bill.
Delete at index i: Remove the bill at index i.

Structure of the bill:
Name: The customer's name.
Amount: The bill amount.
Timestamp: To prevent starvation.

Input	Output
Press Q to Exit. Enter Customer 1: Name: Alice Amount: 200 Enter Customer 2: Name: Bob Amount: 100 Enter Customer 3: Name: Charlie Amount: 300 Enter Customer 4: Name:Dave Amount: 200 Enter Customer 5 Name:Charlie Amount: 300 Enter Customer 6 Name: Q	Processed bill: Charlie, Amount: 300, Timestamp: 3 Alice, Amount: 200, Timestamp: 1 Bob, Amount: 100, Timestamp: 2 Dave, Amount: 200, Timestamp: 4 No bills to process.