**PSG COLLEGE OF TECHNOLOGY, COIMBATORE-04**

**DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES**

**II Semester MSc Software Systems**

**18XW26 Data Structures Lab**

**STACKS, QUEUE**

**Problem Sheet – 6**

1. There are three queues 0, 1 and 2 in a big bazaar to enter into a lucky center. In the entrance itself a random number is assigned to each customer and this number is considered as his unique identification number.

Write a computer program to perform the following using queue data structure.

1. Define a two dimensional array to handle 3 queues. Each row represents a queue.
2. The customer has to select one of the queues by dividing the random number by 3, and the remainder value tells the queue’s number. Insert the random number of the customer into the corresponding queue.
3. Whenever the supervisor of the hall comes, he wants to see the status of waiting candidates, so display the random numbers of customers in all three queues. Also display the number of customers standing in each queue. (Retain the data of queues even after displaying the data, for that use temporary queues).
4. Read a random number, and search whether the given number is in any one of the queue or not. If so, display the queue’s number.

**Sample Input/Output:**

1. New customer 2. Supervisor visit 3.Search 4. Exit

Enter your choice 1 Enter a random number 7

1. New customer 2. Supervisor visit 3.Search 4. Exit

Enter your choice 1 Enter a random number 81

1. New customer 2. Supervisor visit 3.Search 4. Exit

Enter your choice 1 Enter a random number 13

1. New customer 2. Supervisor visit 3.Search 4. Exit

Enter your choice 2

Queue 0: 81 Count:1

Queue 1: 7,13 Count:2

Queue 2: Count:0

1. New customer 2. Supervisor visit 3.Search 4. Exit Enter your choice 3

Enter a random number to be searched 7 Present in queue 1

1. There are two stacks like parking areas 0 and 1 for an apartment XYZ. When a new car comes, the security guard gives a token with a random number.

Write a computer program to perform the following using stack data structure.

1. Define a two dimensional array to handle 2 stacks. Each row represents a stack.
2. The car driver has to divide the random number by 2, and the remainder tells which stack area he has to park. The security guard inserts the car number into the corresponding stack area.
3. Whenever the area cleaner comes to clean the parking area, the cars are taken out and temporarily parked outside. Display the order in which the car numbers are parked. Also display the number of cars standing in each stack area. (use temporary stacks to store the car numbers while displaying the car numbers )
4. Read a car number, and search whether the given car is parked in any one of the stack area or not. If so, display the stack area’s number.

**Sample Input/Output:**

1. New car 2. Cleaner visit 3.Search 4. Exit Enter your choice 1

Enter a random number 9 Enter a car number 1093

1. New car 2. Cleaner visit 3.Search 4. Exit Enter your choice 1

Enter a random number 10 Enter a car number 4477

1. New car 2. Cleaner visit 3.Search 4. Exit Enter your choice 1

Enter a random number 91 Enter a car number 1122

1. New car 2. Cleaner visit 3.Search 4. Exit Enter your choice 2

Stack area 0: 4477 count:1

Stack area 1:1093, 1122 count:2

1. New car 2. Cleaner visit 3.Search 4. Exit Enter your choice 3

Enter a car number to be searched 4477

Present in stack area 0