

# CS110: Computer Programming Lab

## Department of CSE

### IIT, Guwahati

#### Module 04 Stage 02 Exercise 12

Assessment exercises are designed to help us check if the student has learned the basics of the topics included in the drill instructions. However, a drill assessment is not a comprehensive assessment. A fuller and complete assessment aimed at determining the course grades will be done through CS110 examinations.

It is expected that the student will attempt and solve many more exercises from the drill assessment sets to improve their programming skills and for an excellent performance at the examinations.

#### Exercise

Consider the following list of students with their roll numbers and gender information nominated by IITG students for various committees. Each committee must have 5 students and every committee must have at least two members from each gender. A student serves on only one committee.

Form as many committees as you can by selecting students for committees in the order listed.

```
1000 Ram Male
1002 Radha Female
1004 Alka Female
1018 Rahim Male
1007 Narendra Male
1005 Soniya Female
1200 Rahul Male
1150 Jyoti Female
1127 Sita Female
1146 Krishna Male
1176 Padmavati Female
1129 Aditya Male
1127 Arjun Male
1026 Saanvi Female
1147 Muhammad Male
1143 Dhruv Male
1093 Pari Female
1087 Zara Female
1034 Jhanvi Female
0 Marks End
```

List the committees formed by listing the member names.

## How to Implement?

There are two obvious ways to use class queue to solve this problem. This exercise must write both the codes separately and compare the different committees each approach forms.

### *Solution with Two Queues*

In this arrangement, form two queues; one for males and other for females. Read all input lines into these queues.

Form the committees by including three members from the queue with larger size.

### *Solution with One Queue*

This solution will have only one queue and a separate variable to show the gender of the entries in the queue. At all times, all entries in the queue will be of same gender.

The committees will be created on-the-fly even as input is being read. The committee will be printed when formed before reading the next input. Input read will either be added to the queue or into the partially formed committee.

### Interface queue

```
#ifndef QUEUE_H_INCLUDED
#define QUEUE_H_INCLUDED

/* Returns a reference (pointer) to a new queue */
void * mkQueue(void);

/* Removes a queue specified by a valid reference */
int rmQueue (void *);

/* Returns number of entries in a validly referenced queue */
int sizeQ (void *);

/* Place objP in queueP and returns new count of entries */
int joinQ (void * queueP, void * objP);

/* Return earliest arrived objP in queue */
void * leaveQ (void *);

#endif // QUEUE_H_INCLUDED
```