

Implement the following three question in C programming language using semaphore.

1. In a railway ticket booking office, maximum 10 persons, either male, female, or both are allowed to go inside. There are three ticket counters in the booking office. Among these 10 persons, a maximum of 3 persons are allowed to book the ticket at a time with a restriction that all these 3 persons can neither be male nor be female. It means that maximum of 2 males with 1 female or maximum of 2 females with 1 male is allowed to book the ticket. Write a solution using semaphore to synchronize among the males and females to book their ticket.
2. In a railway station, there are 3 rest rooms. In each rest room, only one passenger is allowed to take rest at a time. Write a solution using semaphore to synchronize among the passenger to avoid the race condition for accessing the rooms.
3. In a civilized society, a gentle man lives with his spouse and his elderly parents. Due to old age, his parents cannot be left alone in the house. So, at least any one of the spouse must be available in the house. Write a synchronize solution using semaphore for this problem.

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Implement Round Robin and Priority Scheduling technique both in the single scheduler of xv6. The default scheduler of xv6 is round-robin. The implementation of priority scheduling link is as given below(You may follow other links). You go through both the scheduler and try to implement by combining both in one.

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