

**Task 1: (CLO 1)**

**[10]**

There is a garage where the access road can accommodate any number of trucks at one time. The garage is built such a way that only the last truck entered can be moved out. Each of the trucks is identified by a positive integer (a truck\_id). Write a program to handle truck moves, allowing for the following commands:

- a) On\_road(truck\_id);
- b) Enter\_garage (truck\_id);
- c) Exit\_garage(truck\_id);
- d) Show\_trucks (garage or road);

If an attempt is made to get out a truck which is not the closest to the garage entry, the error message Truck is not near garage door

Input:	Output:
On_road(2)	Road Vehicle: 2_5_10_9_22
On_road(5)	Garage Vehicle: Empty
On_road(10)	Road Vehicle: 5_10_9_22
On_road(9)	Garage Vehicle: 2
On_road(22)	Error: 10 NO. Vehicle cannot enter into garage.
Show_trucks (road)	Error: 2 No. Vehicle cannot exit garage.
Show_trucks (garage)	5 No. vehicle leaving garage
Enter_garage(2)	Garage Vehicle: 2
Show_trucks (road)	
Show_trucks (garage)	
Enter_garage(10)	
Enter_garage(5)	
Exit_garage(2)	
Exit_garage(5)	
show_trucks (garage)	

**Task 2: (CLO 2)**

**[10]**

Consider there are 10 persons. They would like to choose a leader. The way they decide is that all 10 sit in a circle. They start a count with person 1 and go in clockwise direction and skip every M<sup>th</sup> person until the one person left.

**Task 3: (CLO 4)**

**[10]**

Farey fraction of level one are defined as sequence  $\left(\frac{0}{1}, \frac{1}{1}\right)$ . This sequence is extended in level two to form a sequence  $\left(\frac{0}{1}, \frac{1}{2}, \frac{1}{1}\right)$ , sequence  $\left(\frac{0}{1}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{1}{1}\right)$  at level three, sequence  $\left(\frac{0}{1}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{1}{1}\right)$  at level four, so that at each level  $N$ , a new fraction  $\frac{a+b}{c+d}$  is inserted between neighbor fractions  $\frac{a}{c}$  and  $\frac{b}{d}$  only if  $c + d \leq N$ . Write a program which takes an input number  $N$  entered by the user then you have to generate the sequence of series of level  $N$  using link list and then display them.