Learning by Doing 2

**Suppose that a client performs an intermixed sequence of (queue enqueue and dequeue operations. The enqueue operations put then integers 0 through 9 in order onto the queue; the dequeue operations print out the return value. Which of the following sequence(s) could not occur?**

Enqueue operation for integers 0 through 9

Queue = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]

1. **0 1 2 3 4 5 6 7 8 9 - Possible**

enqueue 0, dequeue, enqueue 1, dequeue, enqueue 2, dequeue, enqueue 3, dequeue, enqueue 4, dequeue, enqueue 5, dequeue, enqueue 6, dequeue, enqueue 7, dequeue, enqueue 8, dequeue, enqueue 9, dequeue

[~~0~~, ~~1~~, ~~2~~, ~~3~~, ~~4~~, ~~5~~, ~~6~~, ~~7~~, ~~8~~, ~~9~~]

1. **4 6 8 7 5 3 2 9 0 1 - impossible**

enqueue 0, enqueue 1, enqueue 2, enqueue 3, enqueue 4, dequeue

[~~0~~, 1, 2, 3, 4 it gives 0 instead of 4 after dequeue operation, which makes the sequence could not occur.

1. **2 5 6 7 4 8 9 3 1 0 - impossible**

enqueue 0, enqueue 1, enqueue 2, dequeue

[~~0~~, 1, 2 it gives 0 instead of 2 after dequeue operation, which makes the sequence could not occur.

1. **4 3 2 1 0 5 6 7 8 9 - impossible**

enqueue 0, enqueue 1, enqueue 2, enqueue 3, enqueue 4, dequeue

[~~0~~, 1, 2, 3, 4 it gives 0 instead of 4 after dequeue operation, which makes the sequence could not occur.