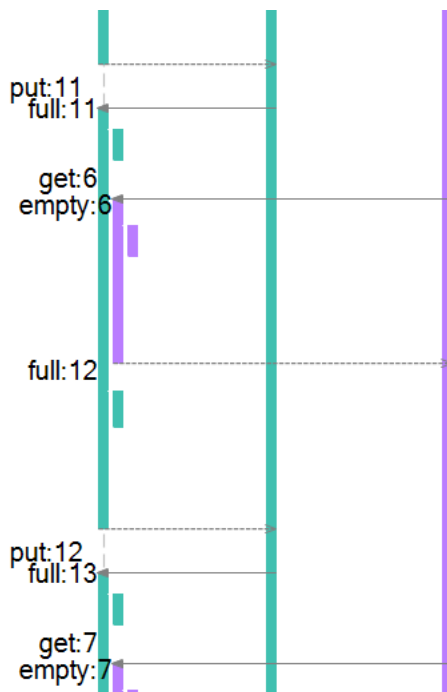A) With reference to sequence diagram at location **put:11** the buffer is full so producer is waiting for the data to be consumed by consumer. Once the consumer consumes the data after then only an empty slot available to put the data by producer. This could happen at multiple places, one snippet from sequence diagram is shown below:

2) The **count** field which keeps track of how many values may be taken out by the consumer is sufficient to provide information regarding the buffer status. If value of count reaches to size of buffer it means buffer is full and producer can't put more value until at least one value taken by consumer.

If the count is zero it means buffer is empty and consumer must wait for some value to be put by producer. If value of count greater than 1 and less than buffer size then both producer and consumer can run.

The state diagram is provided for the same.