Prob 1: Circular Queue Hint

- Decide the initial value for the front and rear
- Always you need a Capacity(How much consecutive memory allocated(ie: length)
- Always move **front** and **rear** by applying (index + 1) % capacity to wrap around.
- Need to condition to check queue is empty
- Need to condition to check queue is full
- If the queue is full resize(double the capacity), and reassign the front and rear properly

<u>**Insertion Example 1:**</u>

Insert("D")

Capacity = 5

[0] [1] [2] [3] [4]   <-- indexes

front → 0

rear → 2

Array looks like:

[A][B][C][   ][   ]

Now if rear moves forward:

rear = (rear + 1) % capacity = (2 + 1) % 5 = 3

Output: [A][B][C][D][   ]

<u>**Insertion Example 2:**</u>

Insert("K")

[0] [1] [2] [3] [4]

[X][Y][Z][W][V]

   ↑

   Front = 1 , rear = 4

    rear just moved here (wraps back using %)

rear = (rear + 1) % capacity = (4+1)%5 = 0

[0] [1] [2] [3] [4]

[K][Y][Z][W][V]

Resize

Array is Full Original Capacity 5	After Resize New Capacity = 10
rear = 1 → front = 2 → B C / - A	newData front = 0 → / - A B rear = 4 → C newCapacity = 10