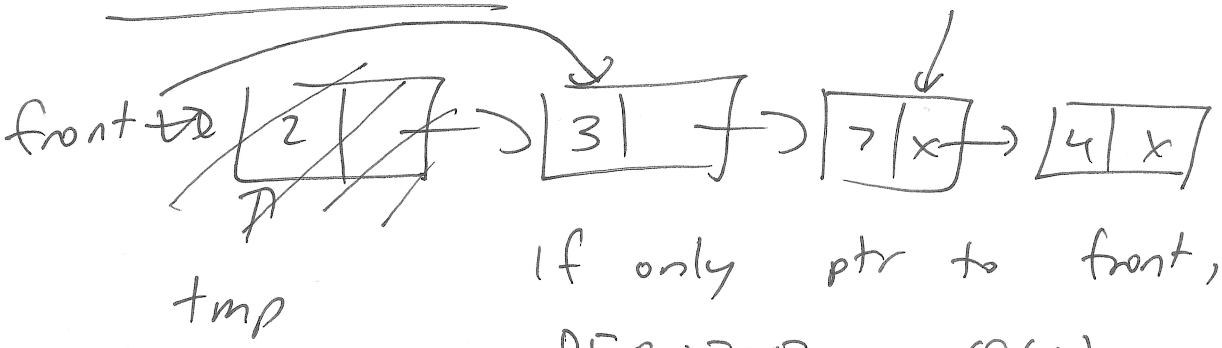
COP 3502 2/26/26

Queue LL

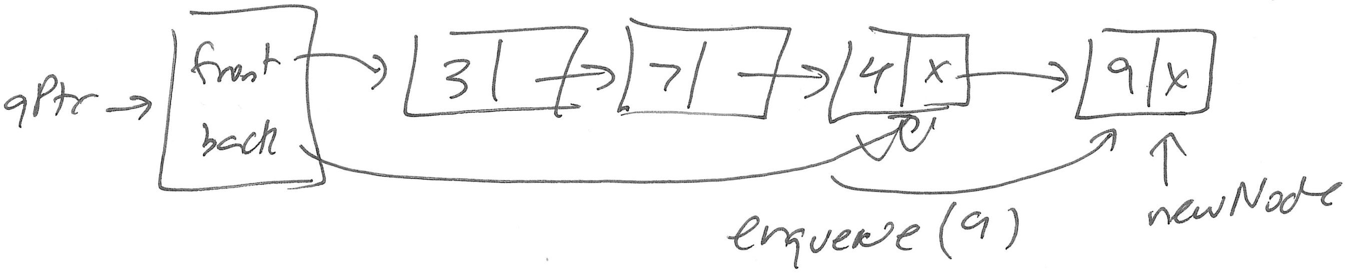


If only ptr to front,

DEQUEUE - O(1)

ENQUEUE - O(n), n = # items queue

enqueue(4)



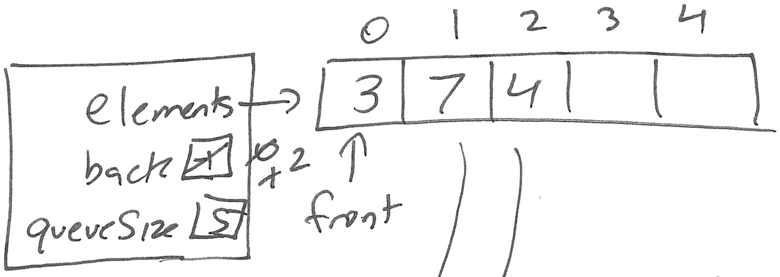
Store struct w/ ptrs to both front + back

enqueue O(1), dequeue O(1)

front() → returns front w/o dequeuing

size(), empty()

Array Implementetion of QUEUE



enqueue(3)

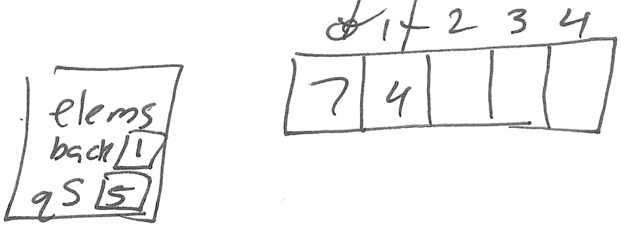
enqueue(7)

enqueue(4)

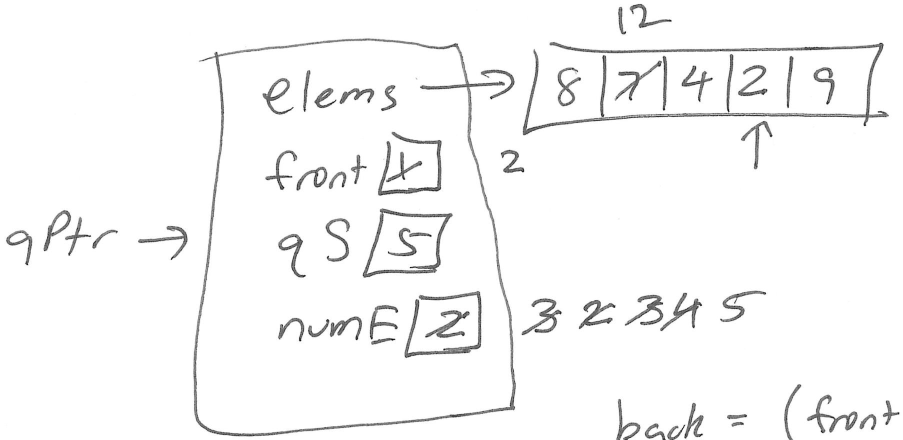
↓

runtime O(1)

Pic for x = dequeue() → runtime n = # elems O(n)



BETTER IDEA LET front index move!



enqueue(2)

dequeue

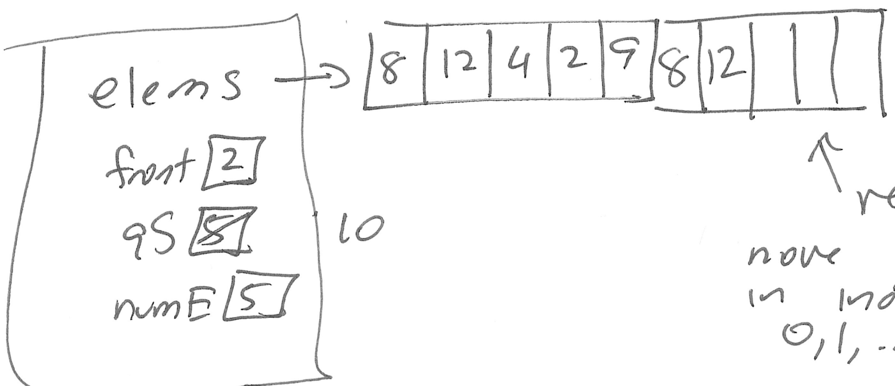
enqueue(9)

enqueue(8)

enqueue(12)

enqueue → back = (front + numE) % qS

dequeue → front = (front + 1) % qS



enqueue(10)

↑ realloc (1)

move items (2)
in indexes
0, 1, ... front-1 To

oldqS, oldqS+1, oldqS+2, . . .

```
for (int i=0; i<front; i++)
    elems[i + qS] = elems[i];
qS *=2; // Do after
```