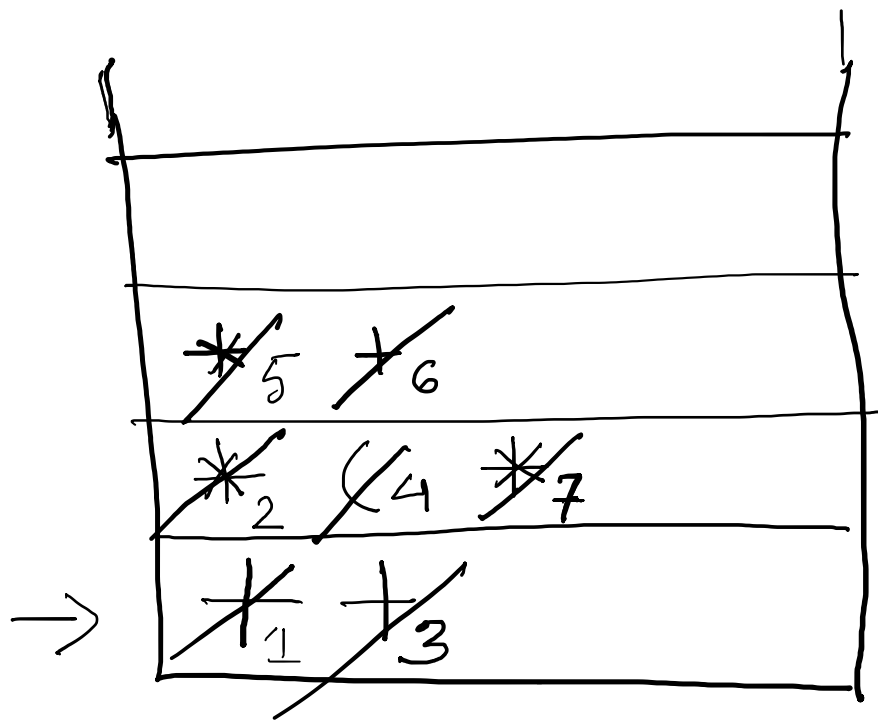


$$a + b * c + (d * e + f) * g$$

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

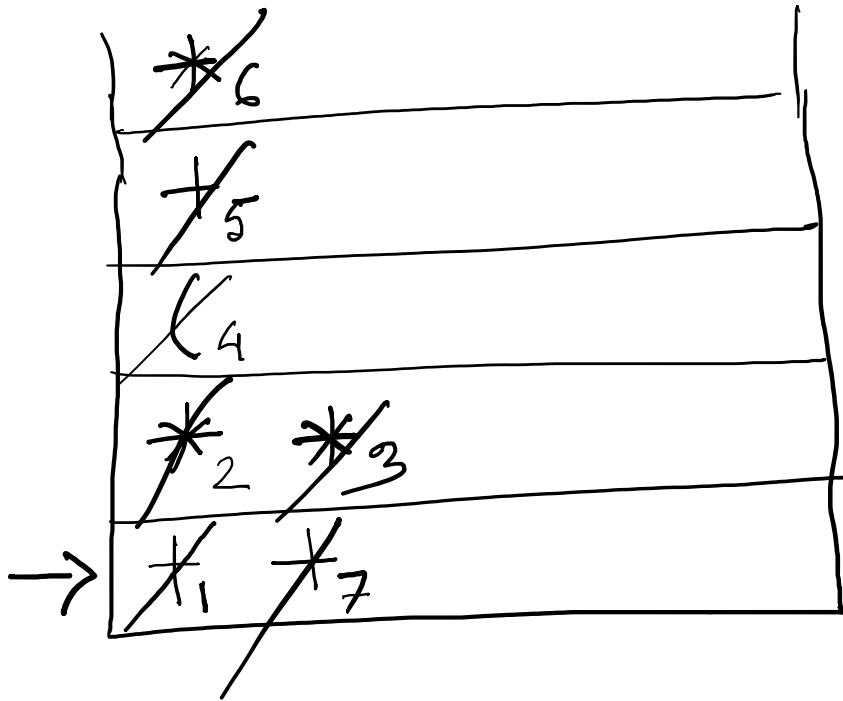
output: $1abc*_2+_1de*_5f+_6g*_7+_3$



$$1 + 2 * 3 * (4 + 5 * 6) + 7$$

$\uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow$

Output: 1 2 3 *₂ 4 5 6 *₆ +₅ *₃ +₁ 7 +₇



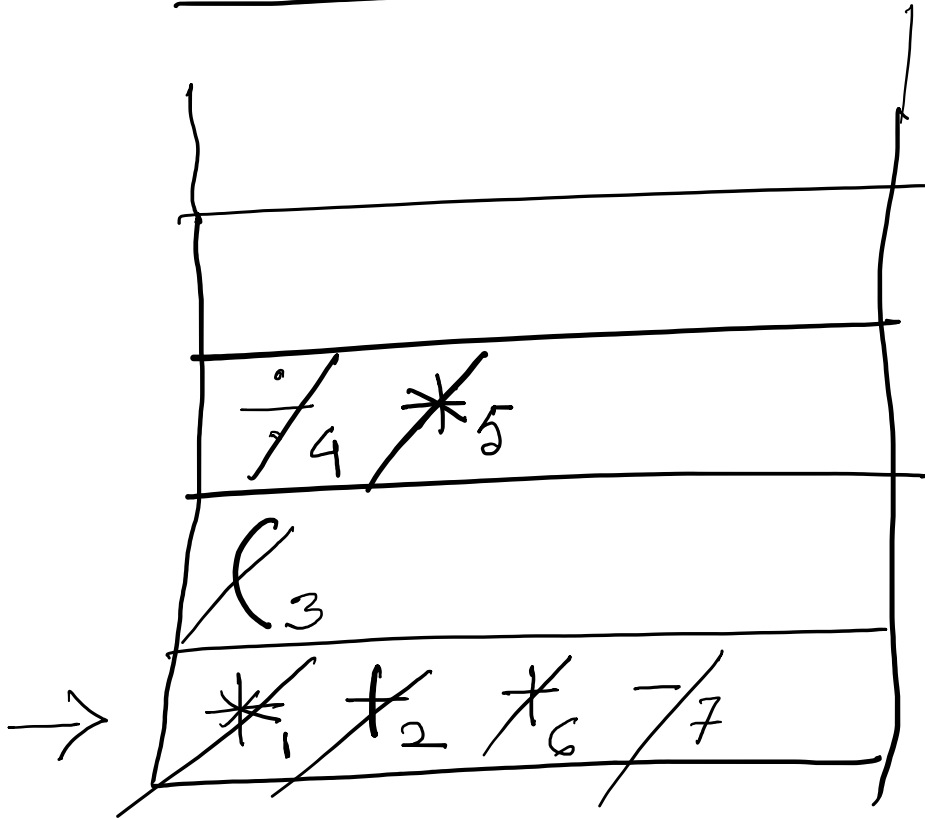
- $5 * 3 + (6 \div 3 * 4) + 8 - 1$
- $(5 - 2 * 2) + 8 \div 2 - 1 * (4 + 9)$

$$5 * 3 + (6 \div 3 * 4) + 8 - 1$$

$\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$

Output: $5 \ 3 \ *_1 \ 6 \ 3 \ \div_4 \ 4 \ *_5 \ +_2 \ 8 \ +_6 \ 1 \ -_7$

$5 \ 3 \ * \ 6 \ 3 \ \div \ 4 \ * \ + \ 8 \ + \ 1 \ -$



$$15 + 8 + 7$$

$$= 30$$

$\begin{array}{ccccccccc} 5 & 3 & * & 6 & 3 & \div & 4 & + & 8 & + & 1 & - \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \end{array}$

$$5 * \underline{3} = 15$$

$$6 \div 3 = 2$$

$$2 * 4 = 8$$

$$15 + 8 = 23$$

$$23 + 8 = 31$$

$$31 - 1 = \textcircled{30}$$

3 4
3 6 2 8 9 1
5 15 23 31 30

Output: $5 \ 2 \ 2 \ *_3 -_2 \ 8 \ 2 \ \div_5 \ +_4 \ 1 \ 4 \ 9 \ +_9 \ *_7 -_6$

Output: $5 \ 2 \ 2 \ *_3 -_2 \ 8 \ 2 \ \div_5 \ +_4 \ 1 \ 4 \ 9 \ +_9 \ *_7 -_6$

$$522 * - 82 \div + 149 + * -$$

A handwritten list of numbers 1 through 9, each preceded by a unique symbol and a diagonal slash. The symbols are: a plus sign for 9, an asterisk for 3, a cross for 8, a plus sign for 2, a dot for 5, an asterisk for 7, a cross for 1, a plus sign for 4, and a plus sign for 6. The list is written on lined paper.

$522 * - 82 \div + 149 + * -$
 $\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$

$$2 * 2 = 4$$

$$5 - 4 = 1$$

$$8 \div 2 = 4$$

$$1 + 4 = 5$$

$$4 + 9 = 13$$

$$1 * 13 = 13$$

$$5 - 13 = -8$$

9
2 2 4 13
2 4 8 4 13
5 x 5 -8

Queue

Operations

→ enqueue

↳ insert at the end

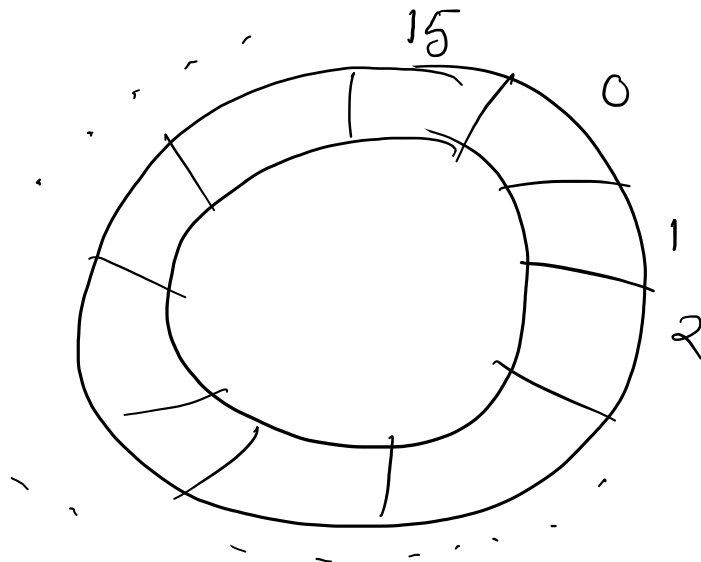
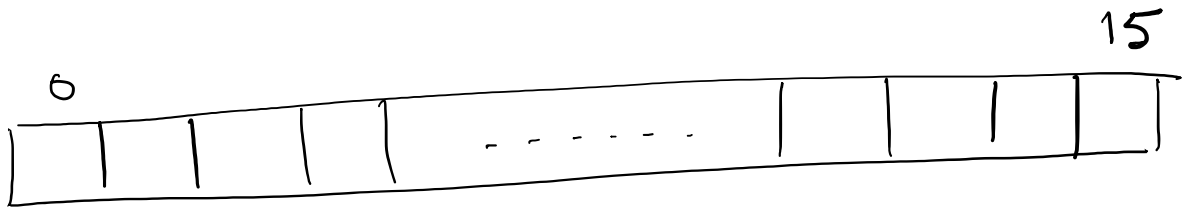
↳ rear / back / write

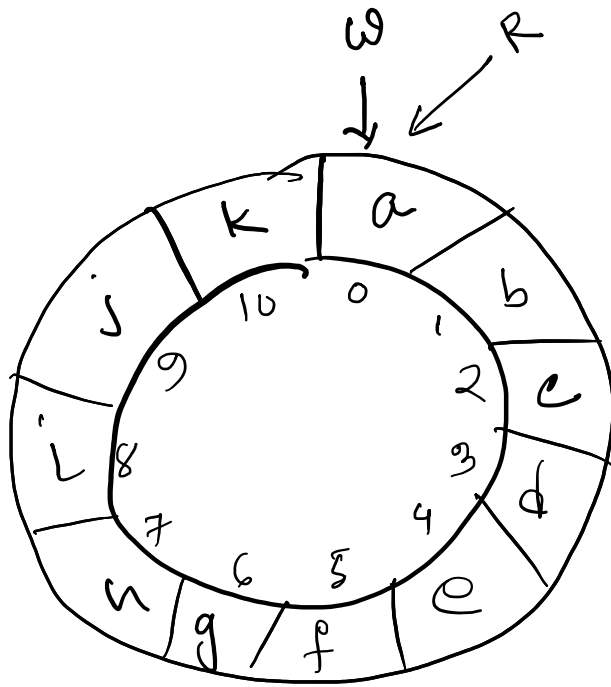
→ dequeue

↳ remove an element from front

↳ front / read

→ FIFO





$R == W \rightarrow \text{empty}$

$R == W \rightarrow \text{full}$

ambiguity ??

check if the cell is empty or not

↳ if empty

↳ the list is empty

↳ if not

↳ the list is full

OR

check size

$\text{index} = (\text{index} + 1) \% N \rightarrow \text{array size}$