

Queue Syntax Learning

```

4 public class Solution {
5
6     public static void main(String[] args) {
7         /* Enter your code here. Read input from STDIN. Print output */
8         Queue<Integer> s = new LinkedList<>();
9         Scanner sc = new Scanner(System.in);
10        int t = sc.nextInt();
11        for(int i=0;i<t;i++){
12            int n = sc.nextInt();
13            switch(n){
14                case 1: System.out.println(s.size());
15                break;
16                case 2: if(s.size()<=0){
17                    System.out.println(-1);
18                }else{
19                    s.remove();
20                }
21                break;
22                case 3: int x = sc.nextInt();
23                    s.add(x);
24                    break;
25                case 4: if(s.isEmpty()){
26                    System.out.println(-1);
27                }else{
28                    System.out.println(s.peek());
29                }
30            }
31        }
32    }
33 }
```

You are screen sharing

Point Binary

$$n = 4$$

1 to 4

$$1 \rightarrow 1$$

$$2 \rightarrow 10$$

$$3 \rightarrow 11$$

$$4 \rightarrow 100$$

$$5 \rightarrow 101$$

$$6 \rightarrow 110$$

$$7 \rightarrow$$

$$8 \rightarrow 1000$$

$$9 \rightarrow$$

$$10 \rightarrow 1010$$

$$\begin{array}{r} 2 \\ \overline{)1} \\ 0 \end{array} \quad \begin{array}{r} 01 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)2} \\ 1 \end{array} \quad \begin{array}{r} 10 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)3} \\ 1 \end{array} \quad \begin{array}{r} 11 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)4} \\ 4 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)4} \\ 2 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 100 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)5} \\ 2 \\ \hline 1 \end{array} \rightarrow \begin{array}{r} 101 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)6} \\ 2 \\ \hline 1 \end{array} \rightarrow \begin{array}{r} 110 \end{array}$$

$$\begin{array}{r} 2 \\ \overline{)8} \\ 2 \\ \hline 1 \end{array} \quad \begin{array}{r} 1000 \end{array}$$

$$\begin{array}{r} 4 \\ \hline 2 | 2 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 10 \\ \hline 2 | 5 \\ \hline 2 | 2 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1010 \\ \hline \end{array}$$

$$1010 = \underline{10} + \underline{0 \times 2^0} + \underline{1 \times 2^1} + \underline{0 \times 2^2} + \underline{1 \times 2^3}$$

$$0 + 2 + 0 + 8 = \underline{10}$$

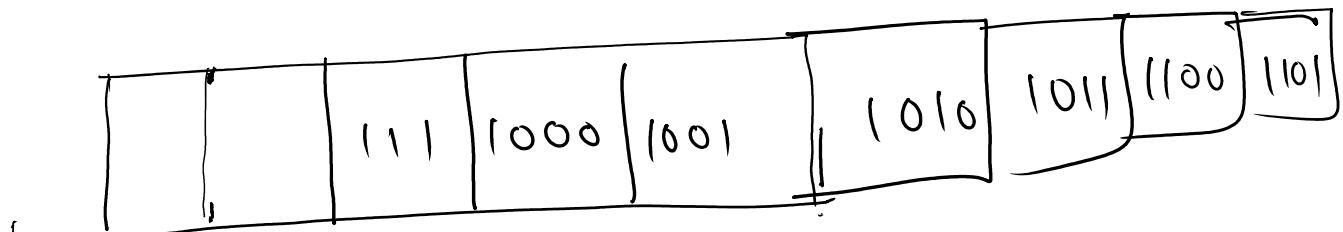
$$\frac{1+6}{-}$$

$$\begin{array}{ll}
 1 & \rightarrow 1 \\
 10 & \rightarrow "1" + "0" \rightarrow \underline{\underline{10}} \\
 11 & \rightarrow "1" + "1" \rightarrow \underline{\underline{11}} \\
 100 & \rightarrow "10" + "0" \rightarrow \underline{\underline{100}} \\
 101 & \rightarrow "10" + "1" \rightarrow \underline{\underline{101}} \\
 110 & \rightarrow "11" + "0" \rightarrow \underline{\underline{110}} \\
 111 & \rightarrow "11" + "1" \rightarrow \underline{\underline{111}} \\
 1000 & \rightarrow "100" + "0" \rightarrow \underline{\underline{1000}}
 \end{array}$$

1001 → "100" + "1" → 1001
 1010 → "101" + "0" → 1010
 1011 → "101" + "1" → 1011
 1100 → "110" + "0" → 1100
 1101 → "110" + "1" → 1101
 1110 → "111" + "0" → 1110
 1111 → "111" + "1" → 1111

(18) $\rightarrow 2 \overline{18} \rightarrow 0 \quad n/2 \}$

$$\begin{array}{r}
 2 \overline{9} \rightarrow 1 \\
 2 \overline{4} \rightarrow 0 \\
 2 \overline{2} \rightarrow 0 \\
 \hline
 \end{array}
 \quad \begin{array}{l}
 n = n/2 \\
 \hline
 2^4, 2^3, 2^2, 2^1, 2^0 \\
 \hline
 10010 \\
 \hline
 18 + 2 = 18
 \end{array}$$



$\frac{1}{1}$ → Output
 "1" + "0" → 1.
 "1" + "1" → 11.
 $\underline{\hspace{10em}}$
 10
 "1...1" → 100 5 - 101

1 ← 1.
 2 ← 10.
 3 ← 11.
 4 ← 100.
 5 - 101

$$\begin{array}{r} \overline{10} \\ "10" + "0" \rightarrow 10.0 \\ "10" + "1" \rightarrow 101 \\ \hline 11 \end{array}$$
$$\begin{array}{r} \overline{5-101} \\ 6 - 110 \\ \hline 7-111 \end{array}$$

$$\begin{array}{r} \overline{11} \\ "11" + "0" \rightarrow 11.0 \\ "11" + "1" \rightarrow 111 \\ \hline \overline{100} \end{array}$$
$$\begin{array}{r} "100" + "0" \rightarrow 100.0 \\ "100" + "1" \rightarrow 100.1 \\ \hline 101 \end{array}$$

$$\begin{array}{r} \overline{"101" + "0" \rightarrow 10.10} \\ "101" + "1" \rightarrow 10.11 \end{array}$$

$$\begin{array}{r} \overline{110} \\ 1100 \\ \hline \overline{1101} \\ 111 \end{array}$$

Code :- 1 to n.

```
Queue <String> q = new LinkedList<>();
q.add("1");
for(int i=1; i<=n; i++) {
    String value = q.poll(); // 1
    System.out.println(value);
    q.add(value + "0");
    q.add(value + "1");
}
```

First Negative Integer

$$n = 5$$

$$k = 2$$

$$arr = [-8, 2, 3, -6, 10]$$

Output

$$\hookrightarrow -8, 0, -6, -6$$

$$n = 6$$

$$k = 3$$

$$arr = [8, -10, 5, 4, -3, -2]$$

$$-10, -10, -3, -3$$

$$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5$$

$$8, -10, 5, 4, -3, -2$$

$$k = 3$$



0 to n

1st window

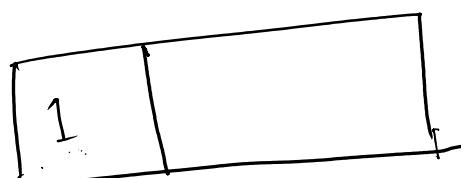
0 to 2

$$0 \quad 8 > 0$$

$$1 \quad -10 < 0$$

$$2 \quad 5 > 0$$

at



↓ ↓

window

2. $i = 2$
When we are at
index 2

$i >= k - 1$

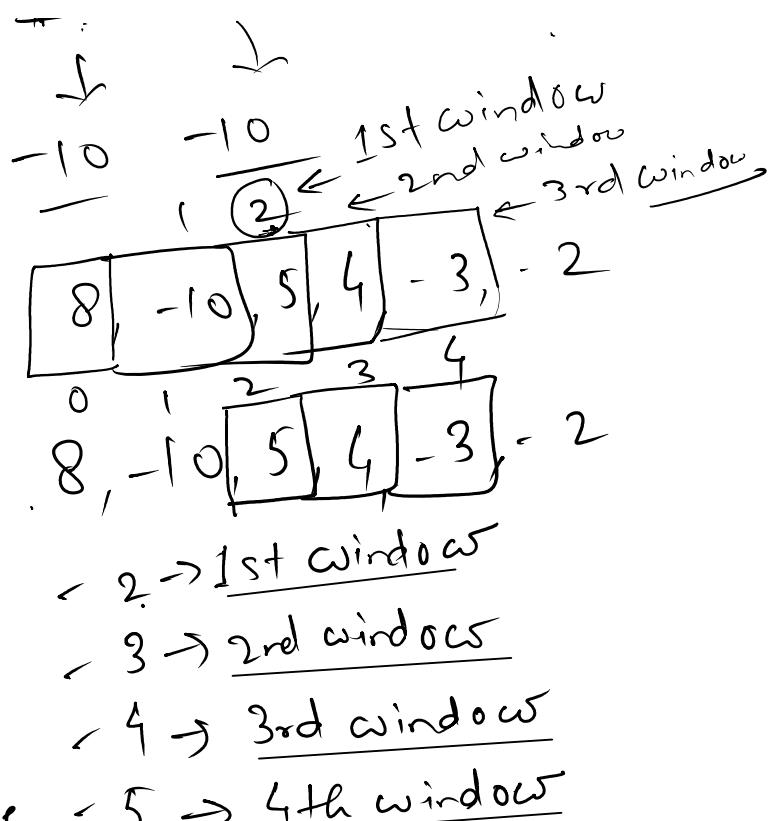
We need to get
first negative value,
if queue is not
empty

if (!queue.isEmpty()) {

 S.o.Println(arr[queue.peek()]);

 arr[1] = -10

} else {
 S.o.Println(0);
}



$\leftarrow 2 \rightarrow$ 1st window

$\leftarrow 3 \rightarrow$ 2nd window

$\leftarrow 4 \rightarrow$ 3rd window

$\leftarrow 5 \rightarrow$ 4th window

8, -10, 5, 4, -3, -2

① ② ③ ④

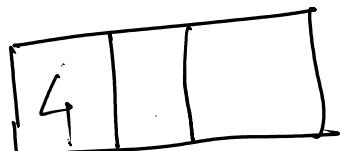
8, -10, 5 → 1st window → arr[1] → -10

① ② ③ ④

-10, 5, 4 → 2nd window → arr[1] → -10

② ③ ④

5, 4, -3 → 3rd window → arr[1] → -10



Wrong answer

T.L queue.peek() is less than starting index..

If queue.peek() is less than starting index of current window, then we need to poll.

↳ arr[4] → -3.

$$\underline{i-(k-1)} = i-k+1$$

Code:-

Queue<Integer> q = new LinkedList<>();

```
for(int i=0; i<n; i++) {
    if(arr[i]<0) {
        q.add(i);
    }
    if(!q.isEmpty() && q.peek()< i-(k-1)) {
        q.poll();
    }
    if(i>=k-1) {
        if(queue.isEmpty()) {
            s.o.println(0);
        }
    }
}
```

```

} else {
    System.out.println("arr[" + q.peek() + "]);"
}
}

```

```

1 public static void main(String[] args) {
2     /* Enter your code here. Read input from STDIN. Print output to STDOUT */
3     Scanner sc = new Scanner(System.in);
4     int n = sc.nextInt();
5     int k = sc.nextInt();
6     int arr[] = new int[n];
7     for(int i=0;i<n;i++){
8         arr[i] = sc.nextInt();
9     }
10    Queue<Integer> q = new LinkedList<>();
11    for(int i=0;i<n;i++){
12        if(arr[i]<0){
13            q.add(i);
14        }
15        if(!q.isEmpty() && q.peek()<i-(k-1)){
16            q.poll();
17        }
18        if(i>=k-1){
19            if(q.isEmpty()){
20                System.out.print(0+" ");
21            }else{
22                System.out.print(arr[q.peek()]+" ");
23            }
24        }
25    }
26 }
27 }
28 }
29 }
30 }
31 }
32 }

```