Goal

- Today we will cover a very important algorithm - Binary Search.

Resources

Binary Search

- Quick Birds Eye View
  - https://www.youtube.com/watch?v=MFhxShGxHWc
- Detailed Explanation
  - by Errichto
  - This guy is an LGM on Codeforces.
  - So, he kinda knows what he is talking about.
  - https://www.youtube.com/watch?v=GU7DpgHINWQ

Questions

Binary Search

1. Given an integers n and q.
   - Followed by a list of n integers in ascending order.
   - Now you will be given q integers.
     - For each integer output the index, if the integer exists in the list given above.
     - If the integer doesn't exist in the list, print -1.
     - You checking should be performed using binary search.
   - sample_input

```
10 5
1 2 3 4 5 6 7 8 9 10
7
3
11
1
10
```

   - sample_output

```
6
2
-1
0
9
```

2. Given an integer x print its square root if it is a perfect square otherwise print -1.
    - Use binary search to find the square root.
    - sample_input_1

```
100000000
```

    - sample_output_1

```
10000
```

    - sample_input_2

```
1000
```

    - sample_output_2

```
-1
```

3. Given an integer $n \geq 2$ followed by a list of n integers which are first strictly increasing and then strictly decreasing.
    - The length of the strictly increasing or the strictly decreasing part may be 0.
    - Find the index of the largest element using binary search.
    - sample_input

```
10
1 2 3 4 5 6 7 3 2 1
```

    - sample_output

```
6
```