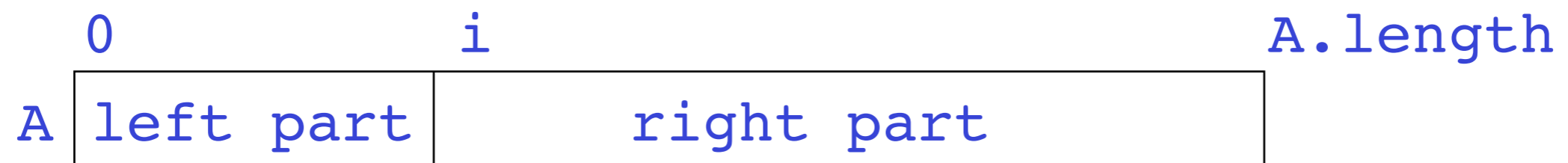# CSCI 241

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Preliminaries: Range Indices, Array Diagrams

Goals

Be able to interpret and use the range index notation we'll be using in this class: `a..b`

Know how to interpret array diagrams like the following:

Range Indices

a..b denotes the range of consecutive integers from (and **including**) a up to (but **excluding**) b.

Examples (unsurprising):

- 0..5 is the range containing 0, 1, 2, 3, 4

- 1..3 is the range containing 1, 2

- 9..10 is the range containing only 9

Range Indices

a..b denotes the range of consecutive integers from (and **including**) a up to (but **excluding**) b.

Examples (maybe a little surprising):

- A[4..6] is shorthand for a subarray of A, containing only its 4th and 5th elements

- 6..6 is a valid range but contains no elements!

- 7..2 is weird, but we'll define it as the empty range

Ranges 1

List the elements in:

- `1..6:`

- `-1..4`

- `5..6`

Ranges 2

How many elements are in:

- `2..3`

- `0..4`

- `0..x`   (assume `x >= 0`)

- `a..b`   (assume `a <= b`)

Ranges 3

`a..b` denotes the range of consecutive integers from (and **including**) a up to (but **excluding**) b.

How many elements are in the range `a..b`?

(assume a <= b)

A. `b-a-1`

B. `a-b-1`

C. `b-a+1`

D. `b-a`

Range Indices

a..b denotes the range of consecutive integers from (and **including**) a up to (but **excluding**) b.

Recall that `A.length` is A's length, and Java array indices start at zero. Which of these denotes all elements of A?

```
A. A[0..A.length]

B. A[0..A.length-1]

C. A[0..A.length+1]

D. A[1..A.length-1]
```
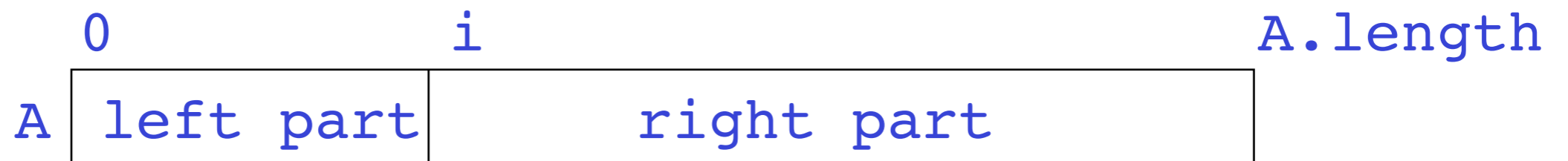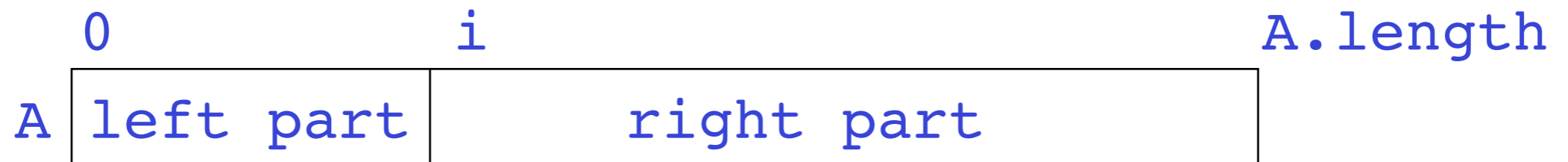
Array Diagrams

We draw arrays using diagrams like this:

A ▭

We can break the array into segments, and label indices:

```
      0                i                    A.length
A | left part |        right part        |
```

Notice that an index lives **to one side** of the
divider, to clarify which segment that element is in.

Array Diagrams

```
      0                 i              A.length
  A | left part |       right part        |
```
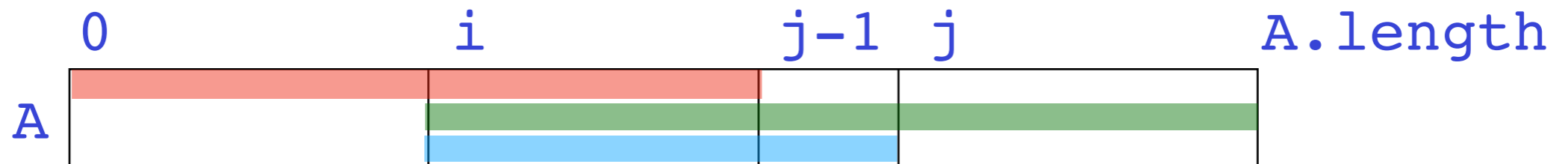
The subarray for the left part the above array is:

```
A. A[0..i]
B. A[1..i]
C. A[1..i-1]
D. A[0..i-1]
```

Array Diagrams

Write the subarray corresponding to:

- The red segment:

- The green segment:

- The blue segment: