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:

\[
\begin{array}{cccc}
0 & i & \text{left part} & \text{right part} \\
\end{array}
\]
Range Indices

\[ a .. b \] denotes the range of consecutive integers from (and \textbf{including}) \( a \) up to (but \textbf{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 \textit{including}) \( a \) up to (but \textit{excluding}) \( b \).

Examples (maybe a little surprising):

- \( A[4..6] \) is shorthand for a \textit{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 \(\geq 0\))
- a..b (assume a \(\leq b\))
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 \( a \leq b \))

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 \textit{including}) \( a \) up to (but \textit{excluding}) \( b \).

Recall that \texttt{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:

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

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

The subarray for the left part of 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: