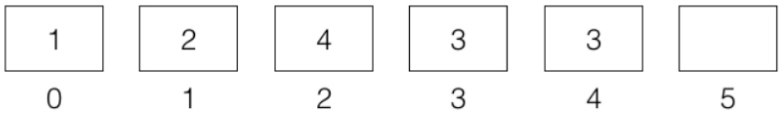
1. What is the difference between an abstract data structure and a (concrete) data structure? 1 point

Note that the terms data structure and concrete data structure will be used interchangeably.

- [ ] A (concrete) data structure consists of a collection of data, but an abstract data structure does not
- [ ] An abstract data structure cannot be implemented, but a (concrete) data structure can be implemented
- [ ] An abstract data structure does not concern itself with how it is implemented, but a (concrete) data structure is an implementation of something abstract
- [ ] An abstract data structure is an abstract data type, but a (concrete) data structure is the model of how computers store and address data

2. Consider the following array: 1 point



Now, if we perform the following sequence of operations:

1. write![0, 5]
2. write![read[3]+read[4], 5]
3. write![read[5], 0]

what is the final value stored at element 0?

Enter answer here

3. What are the differences between an array and a dynamic array? 1 point

- [ ] The number of elements in a dynamic array can be altered, but this number cannot be altered in an array
- [ ] We can retrieve values stored in any element with an array, but not with a dynamic array
- [ ] A dynamic array is an abstract data structure, but an array is a data structure

4. Which of the following are operations on a dynamic array? 1 point

- [ ] length
- [ ] write![o,k]
- [ ] top
- [ ] dequeue!
- [ ] store![o,k]
- [ ] removeAt![k]

5. The following pseudocode command creates a new empty dynamic array called *d*: 1 point

new DynamicArray *d*

Consider the following piece of pseudocode:

new DynamicArray *d*

$$
\begin{aligned}
&d[1] \leftarrow 1 \\
&d[2] \leftarrow 2 \\
&d[3] \leftarrow 3 \\
&x \leftarrow d[2] \\
&d[3] \leftarrow d[1] + d[2] + x \\
&x \leftarrow d[3]
\end{aligned}
$$

What is the final value of *x*?

Enter answer here

6. The following pseudocode command will copy j elements (from element 1 to element *j*) of a vector or dynamic array called *s* to j elements (from element 1 to element *j*) of a vector or dynamic array called *d*: 1 point

$$d[1:j] \leftarrow s[1:j]$$

Using this command consider the following piece of pseudocode:

$$
\begin{aligned}
&\textbf{new } \text{DynamicArray } d \\
&d[1] \leftarrow 1 \\
&d[2] \leftarrow 2 \\
&d[3] \leftarrow 3 \\
&\textbf{new } \text{DynamicArray } s \\
&s[1:2] \leftarrow d[2:3] \\
&x \leftarrow s[1] \times s[2]
\end{aligned}
$$

What is the final value of *x*?

Enter answer here

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