CSE110 Review Questions
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Arrays

Question 1 What are the indices for the first and last positions of any array?
Answers: x[0], x[x.length - 1]

Question 2 Immediately after instantiating a new array of primitives (ints, doubles, etc.), what fills the array? What about an array of objects?
Answers: 0, null

Question 3 What happens when you try to access an array element past the end of the array?
Answer: The code throws an ArrayIndexOutOfBoundsException.

Question 4 Instantiate three arrays called x, y, and z of type int, String, and BackAccount (respectively), all of size 10.
Answers:

```
int[] x = new int[10];
String[] y = new String[10];
BankAccount[] z = new BankAccount[10];
```

Question 5 Write a for-loop to sum all of the elements of an array x of type int.
Answers:
Option 1:

```
int sum = 0;
for (int i = 0; i < x.length; i++) {
        sum += x[i];
}
```

Option 2:

```
int sum = 0;
for (int i : x) {
        sum += i;
}
```

Option 3 (uses Java 8):

```
int sum = IntStream.of(x).sum();
```

Question 6 Write a for-loop to double each element in an array x of type int.
Answer:

```
for (int i = 0; i < x.length; i++)
        x[i] *= 2;
```

Question 7 Write code to store the largest number in an int array x into a variable called max.
Answer:

```
int max = x[0];
for (int i = 1; i < x.length; i++)
        if (x[i] > max)
                max = num[i];
```

Question 8 Write code to count how many numbers in the array are strictly larger than 4, and store that total in a variable called total.
Answer:

```
int total = 0;
for (int i = 0; i < x.length; i++)
        if (x[i] > 4)
                total++;
```

Question 9 Write code to print out every other element in an array separated by tabs.
Answer:

```
for (int i = 0; i < x.length; i+=2)
        System.out.println(x[i] + "\t");
```

Question 10 Write code to shift each number one place to the right (Note: there will be 2 copies of the 1st element when the code finishes).
Answer:

```
for (int i = x.length-2; i >= 0; i--)
        x[i+1] = x[i];
```

Question 11 Write code to print the contents of an array in reverse order, one element for each line.
Answer:

```
for (int i = x.length-1; i >= 0; i--)
        System.out.println(x[i]);
```

Question 12 Use the following array x to answer the following questions:

4 8 5 1 6 3 2

a) What value is given by x[1]?
b) What value is given by x[6]?
c) What value is given by x[7]?
d) What value is given by x.length?
Answers:
a) 8
b) 2
c) ArrayIndexOutOfBoundsException thrown
d) 7

Question 13 Write a method called append that appends the two arrays passed as arguments and returns an array of type int as the result. For example, if the first array argument was {1, 2, 3}, and the second was {4, 5, 6, 7}, append returns {1, 2, 3, 4, 5, 6, 7}.
Answer:

```
public int[] append(int[] a, int[] b) {
        int[] temp = new int[a.length + b.length];
        int j = 0;
        for (int i = 0; i < a.length; i++) {
                temp[i] = a[i];
        }

        for (int i = a.length; i < temp.length; i++) {
                temp[i] = b[j];
                j++;
        }

        return temp;
}
```

Question 14 Write a method called findMin that returns the smallest element in an array that is passed as an argument. For example, if the array was {4, 7, 9, 12, 8, 1, 5}, the method would return 1.
Answer:

```
public int findMin(int[] a) {
        int min = a[0];
        for (int i=1; i < a.length; i++) {
                if (a[i] < min) {
                        min = a[i];
                }
        }
        return min;
}
```