Final Exam Review Questions
CSE110 - Arizona State University

1. What are the indexes for the first and last positions of array called x?

   a. `x[0]` and `x[x.length]`

   b. `x[0]` and `x[x.length - 1]`

   c. `x[1]` and `x[x.length]`

   d. `x[1]` and `x[x.length - 1]`

2. Immediately after instantiating a new array of primitives (`int`s, `double`s, etc.), what fills the array? What about an array of objects?

3. What happens when you try to access an array element past the end of an array?

4. Instantiate three arrays called `x, y` and `z` of types `int, String`, and `BankAccount`, respectively, all of size 10.

5. What is method overloading?

6. Use the following full array, x: {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`?

7. Write a `for`-loop to double each element in the array x given in question 6 above.

8. What is a `static` variable? What is a `static` method?

9,10 Use the following code to answer the parts of question 9,10:

```
public class AmazingClass {
     private static int number;
     public AmazingClass(int a) {
          number = a;
     }
     public int twice() {
          number*=2;
          return number;
     }
}
```

9. What is the value of number after the following statements? (For each part, assume the preceding parts it have already been executed.)

   a. `AmazingClass ac1 = new AmazingClass(3);`

   b. `AmazingClass ac2 = new AmazingClass(7);`

   c. `ac1.twice();`

d. `ac2.twice();`

10. Using the code from question 9, how many copies of the variable number exist after I instantiate 374 different `AmazingClass` objects?

11. What is the meaning of each of `public, static, final, void, main`, and `String[] args`?

12. Given the array from question 6, write the code fragments requested. You don?t need to write them in methods, just assume you?re working within an established main method.

    a. Write code to store the largest number in the array into a variable called `max`.

    b. Write code to count how many numbers in the array are strictly larger than four, and store that total in a variable called `total`.

    c. Write code to print out every other element in the array separated by tabs.

    d. Write code to shift each number one place to the right. There will be two copies of the first element when you're done with this.

    e. Write code to print the contents of the array in reverse order, one element for each line.

13. Circle the valid method headings assuming they are written inside a class named `SomeClass`.

    - `public void Void( )`
    - `public String string( int n )`
    - `public double void f2( )`
    - `public BankAccount bankAccount( )`
    - `public double sum( int left, right )`

14. Use the following array to answer parts of the question: `{Mike, Betsy, Aaron, Steven, Doug, Pat, Elise}`.

    a. Write the contents after each step of selection sort (alphabetical).

    b. Write the contents after each step of insertion sort (alphabetical).

15. Use the sorted list and use a binary search to look for Mike in the list. Show all the names that are going to be compared with Mike before it finds it, and repeat the same process looking for Cathy, which is not in the list: `{Aaron, Betsy, Doug, Elise, Mike, Pat, Steven}`.

16. Write class `LittleStatistician` to maintain two descriptive statistics: `count` and `average`. Write method `add` to add numbers to the collection. Write methods `count` and `average` to return the correct values. Also, write method `toString` to return all elements in the collection as a `String` (see output below). You must use an array instance variable to store the elements. Let the capacity be 5 (kept small here for demonstration purposes). When an attempt is made to add to a `LittleStatistician` object when the array is full (trying to add a 6th or 7th number), print a message stating the number could not be added. The following code on the left must generate the output shown to the right.

```
LittleStatistician tests = new LittleStatistician( );
tests.add( 80.0 );
tests.add( 70.5 );
tests.add( 75.0 );
tests.add( 82.5 );
tests.add( 99.5 );
tests.add( 65.0 );
tests.add( 52.0 );
System.out.println( "Average: " + tests.average( ) );
System.out.println( "Count: " + tests.count( ) );
System.out.println( tests.toString( ) );
```

17. In order to Swap the values of two integers (A and B), we do not need extra integer.
    A)true B)false

18. write a line of code to initialize an 2D array of integers called A with the following values. Afterward what is the value of A[1][2] and A[0][3]?

    1 2 3 4
    5 6 7 8

19. If we have `<String S = "equanimity">`, what is the output of `<S.substring(1,5)>` and `<S.substring(0,3)>`?

    a. ”quani” and ”equa”

    b. ”quani” and ”equ”

    c. ”quan” and ”equa”

    d. ”quan” and ”equ”

20. what is the difference between primitive types and objects in Java? Give an example of each of them.