SWEN20003
Object Oriented Software Development

Arrays and Strings - Questions

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The Road So Far

- OOP Foundations
  - A Quick Tour of Java
  - Classes and Objects

Lecture Objectives

After this lecture you will be able to:

- Understand how to use Arrays
- Understand how to use Strings

What is the correct expression for accessing the 5th element in an array named `colours`?

1. `colours(3)`
2. `colours(5)`
3. `colours(4)`
4. `colours(6)`
5. none of the above

Answer:
(5) none of the above

What is the correct expression for accessing the 3rd element in an array named `colours`?

1. `colours[3]`
2. `colours[2]`
3. `colours[0]`
4. `colours[]`
5. none of the above

Answer:
(2) `colours[2]`

The correct syntax for accessing the length of an array named numbers is:

1. `numbers.length()`
2. `numbers.length`
3. both A and B
4. none of the above
5. `numbers.size()`

Answer:
(2) `numbers.length`

"array out of bounds" error is a:

- compiler error
- syntax error
- runtime error
- all of the above
- none of the above

Answer:
(3) runtime error

Answer true/false to the following statements.

An array is a collection of variables all of the same type.

Answer: true

An array has a public instance variable named length.

Answer: true

The length of the array can be changed through setting the instance variable named length.

Answer: false

String is an immutable class provided by Java.

Answer: true

Write a Java statement that declares and creates an array of Strings named breeds. Your array must be large enough to hold the names of 100 dog breeds.

Answer:

```
String[] breeds = new String[100];
```

Declare and create a 10 x 10 multidimensional array of doubles.

Answer:

```
double[][] x = new double[10][10];
```

Given the following character array:

```
char[] h = { H , E , L , L , O };
```

Write a Java statement that will create a new String object from the character array.

Answer: `String s = String.valueOf(h);`

Assess Yourself

Write a Java static method, `computeDoublePowers`, that accepts an integer `n`, and returns an array of `double`s of that size. Your method should then fill that array with increasing powers of two (starting from 1.0).

Assess Yourself

```java
public static double[] computeDoublePowers(int n) {
    double[] nums = new double[n];

    for (int i = 0; i < n; i++) {
        nums[i] = Math.pow(2, i);
    }

    // For sanity checking
    for (int i = 0; i < n; i++) {
        System.out.println(nums[i]);
    }

    return nums;
}
```

Assess Yourself

Write a program that can generate the following 2D array:

Can you write your program with as **few assumptions as possible**?

Assess Yourself

```
public class Main {
    public static void main(String[] args) {
        int HEIGHT = 5;
        int MAX_WIDTH = HEIGHT;

        int[][] triangleArray= new int[HEIGHT][];

        for (int i = 0; i < HEIGHT; i++) {
            triangleArray[i] = new int[HEIGHT - i];

            for (int j = 0; j < HEIGHT - i; j++) {
                triangleArray[i][j] = i + j + 1;
            }
        }
    }
}
```

Consider the following Java statement that creates a String object.

```
String myString = "Hello";
```

Which of the following will return the length of `myString`?

- `myString.length()`
- `myString.length`
- both A and B
- none of the above
- `myString.size()`

Answer:
(1) `myString.length()`

What is the output of the following program?

```
public class StringDemo {
    public static void main(String[] args) {
        System.out.println("Hello" == "Hello");
        String s1 = "Hello";
        System.out.println(s1 == "Hello");
        String s2 = "Hello";
        System.out.println(s1 == s2);
        System.out.println(s1.equals(s2));
        String s3 = "Hello";
        String s4 = new String("Hello");
        System.out.println(s3 == s4);
        System.out.println(s4.equals(s3));
    }
}
```

Answer:

true

true

true

What is the output of the following program?

```
public class StringMutation {
    public static void main(String[] args) {
        String s = "Hello World";
        s.toUpperCase();
        s.replace("e", "i");
        s.substring(0, 2);
        s += " FIVE";
        System.out.println(s);
    }
}
```

Answer:
Hello World FIVE

Lecture Objectives

Upon completion of this topic you will be able to:

- Use Arrays
- Use Strings