

Programming I

Spring 2009

Practice exercises for final exam

Write a method

1. Write a static method that takes for parameter an array of integers and returns true if the elements form a palindrome, false otherwise (a palindrome is a sequence whose reverse is identical to it, e.g. 12 3 5 5 3 12).
2. Write a static method that takes as parameters two arrays of integers, list1 and list2, and returns true if the lists are identical, false otherwise (make sure you account for lists of different lengths).
3. Write a static method that takes for parameter an array of integers and returns the count of elements whose both left and right neighbors are greater than it. As an example, the count corresponding to the array 4 6 8 **3** 9 10 **2** 7 is 2 (the numbers meeting the criteria are in boldface).
4. Rework problem 3 with two-dimensional arrays. Instead of examining only the left and right neighbors, the method should consider all 4 neighbors.
5. Write a static method that returns the sum of the elements along the diagonals of a two-dimensional array (the middle element should only be included once in the sum). The method assumes that the two-dimensional array has equal number for rows and columns.
6. Write a static method that returns the sums of the elements along the edges of a two-dimensional array of any dimension. For an array with values

```
1 1 1
1 1 1
1 1 1
```

the return value would be 8.

Conditionals

Express each the following set of alternatives as a conditional statement (using if/else or if/else if structures) pertaining to num:

1. a) num is divisible by 10, b) all other values
2. a) num is in the range 1-100 or num is odd, b) all other values
3. a) num is in the range 5-1000 but not 11, 13, 777, 888, 998 b) num is greater than 1000, c) num is less than 0, d) all other values

Types and conversions

Consider the following declarations:

```
int a = 3, b = 5;
double x = 2, y = 3.2;
```

Explain why the output of the following 2 statements is different, even though mathematically the result should be the same.

```
System.out.println(a / b * x);
```

```
System.out.println(x * a / b);
```

Show a statement in which you multiply x and y and store the result in a.

Parameter passing

Consider the following code that's part of the same class (class name and external braces omitted):

```
public static void main(String[] args)
{
    int arr[] = {1, 2};
    int num = 10;

    int result = doSomething(arr, num);
    System.out.println(arr[0]);
    System.out.println(arr[1]);
    System.out.println(result);
    System.out.println(num);
}

public static int doSomething(int[] xyz, int x)
{
    xyz[0] = 100;
    x = 1000;
    return x;
}
```

First, what's the output? Explain the output, one statement at a time (For the exam, make sure you fully understand this).