

CPS 210 - Exam 3

Name:

1)(10 pts) Will the following code execute without an error? What are the errors?

```
int[] array = {1,2,3,4,5};  
  
for(int i = 0; i <= 5; i++) {  
    array[i] = i + 0.5;  
}
```

- A) True
- B) False

Answer: False

Explain:

Because the array is size 5, the loop will try to access the 6th element of the array which does not exist. Also, the array is an integer array and the loop is trying to assign a double value to the array.

2)(10 pts) When passing parameters to a method, which of the following are true?

- A) Integers are passed by reference.
- B) Doubles are passed by copy.
- C) Integer arrays are passed by reference.
- D) Double arrays are passed by copy.

Answer: B, C

Variables are passed by copy, but arrays are passed by reference. This means that the method can change the values of the array and the changes will be reflected in the calling method.

3) (20 pts) In the **main** method create a double array size 10 and fill it with values. Pass the array as a parameter to a method that finds the minimum value in the array and returns it.

```
public class Exam3 {  
    public static void main(String[] args) {  
        double[] array = {1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0,  
10.0};  
        double min = findMin(array);  
  
        System.out.println("The minimum value: " + min);  
  
    }  
  
    public static double findMin(double[] array) {  
        double min = array[0];  
        for(int i = 1; i < array.length; i++) {  
            if(array[i] < min) {  
                min = array[i];  
            }  
        }  
        return min;  
    }  
}
```

4) What is the output of the following program?

```
public class Exam3 {
    public static void main(String[] args) {
        int x = 6;
        int y = 2;
        int z = 5;
        double[] position = {x, y, z};

        System.out.println(manipulate(position));
        for(int i = 0; i < position.length; i++) {
            System.out.println(position[i]);
        }
    }

    public static int manipulate(int[] position) {
        position[0] = 5;
        position[1] = 10;
        position[2] = 15;
        return position[0] + position[1] + position[2];
    }

    public static double manipulate(double[] position) {
        position[0] = 10.0;
        position[1] = 20.0;
        position[2] = 30.0;
        return position[0] + position[1] + position[2];
    }
}
```

A) Output (10 pts):

60.0

10.0

20.0

30.0

B) Explain why (10 pts):

The method `manipulate(double[] position)` is called because the array `position` is a double array. The method sets the values of the array to 10.0, 20.0, and 30.0, which also changes the values in the `main` method. The method returns the sum of the values in the array which is 60.0.

C) Create a method that will print the contents of the `position` array when it is passed as a parameter. (10 pts)

```
public static void printArray(double[] array) {
    for(int i = 0; i < array.length; i++) {
        System.out.println(array[i]);
    }
}
```

5) Answer the following questions about the following code:

```
int[][] array = {{1,2,3,4},{5,6,7,8},{9,10,11,12}};
```

1	2	3	4
5	6	7	8
9	10	11	12

A) What is the array index of 7? (10 pts)

Answer: array[1][2]

B) Write the statements that will print all the values in the array along with their index. (10 pts)

Expected output:

```
1: 0 0
2: 0 1
3: 0 2
and so on...
```

```
for(int i = 0; i < array.length; i++) {
    for(int j = 0; j < array[i].length; j++) {
        System.out.println(array[i][j] + ": " + i + " " + j);
    }
}
```

C) Write a method that will return the sum of all the values in the array. (10 pts)

```
public static int sumArray(int[][] array) {
    int sum = 0;
    for(int i = 0; i < array.length; i++) {
        for(int j = 0; j < array[i].length; j++) {
            sum += array[i][j];
        }
    }
    return sum;
}
```