

CS 149 Nested Loop Exercises

1. What will be printed by each of the following code snippets?

(a)

```
for (int i = 0; i < 3; i++) {  
    System.out.println(i);  
}
```

Solution:

```
0  
1  
2
```

(b)

```
for (int i = 0; i < 3; i++) {  
    System.out.println(i);  
  
    for (int j = 0; j < 2; j++) {  
        System.out.printf(">> %d %d\n", i, j);  
    }  
}
```

Solution:

```
0  
>> 0 0  
>> 0 1  
1  
>> 1 0  
>> 1 1  
2  
>> 2 0  
>> 2 1
```

(c)

```
for (int i = 0; i < 2; i++) {
    System.out.println(i);

    for (int j = 0; j < 2; j++) {
        System.out.printf("-- %d %d\n", i, j);
    }

    for (int k = 0; k < 3; k++) {
        System.out.printf("** %d %d\n", i, k);
    }
}
```

Solution:

```
0
-- 0 0
-- 0 1
** 0 0
** 0 1
** 0 2
1
-- 1 0
-- 1 1
** 1 0
** 1 1
** 1 2
```

(d) Be careful!

```
for (int i = 0; i < 3; i++) {
    System.out.println(i);

    for (int j = i; j < 2; j++) {
        System.out.printf("-- %d %d\n", i, j);
    }
}
```

Solution:

```
0
-- 0 0
-- 0 1
1
-- 1 1
2
```

(e) Be careful!

```
for (int i = 0; i < 3; i++) {
    System.out.println(i);

    for (int j = 0; j < 2; i++) {
        System.out.printf(">> %d %d\n", i, j);
    }
}
```

Solution:

This is an infinite loop because `j` is never incremented. This is a common error that can result from copying and pasting a loop.

```
0
>> 0 0
>> 1 0
>> 2 0
>> 3 0
>> 4 0
>> 5 0
>> 6 0
>> 7 0
...
```

2. The following method should return true if `word` contains any repeated characters. What is wrong with this implementation? How could it be fixed?

(a)

```
public static boolean hasRepeatedCharacter(String word) {  
  
    for (int i = 0; i < word.length(); i++) {  
        for (int j = 0; j < word.length(); j++) {  
            if (word.charAt(i) == word.charAt(j)) {  
                return true;  
            }  
        }  
    }  
  
    return false;  
}
```

Solution: The inner loop should be changed to:

```
for (int j = i + 1; j < word.length(); j++) {
```