Tutorial

Practice Exercises: Teaching Block 1

- Operators (including operator precedence)
- Control structures: selection and repetition
- The **`break`** statement
- Basic Java programs
- Simple problem specifications
- <u>Other practice exercise types</u>: “Fill in the gaps” + “Predict the question”

This set of exercises is in addition to those included directly in lecture slides (and extra reading materials), which you should also attempt.

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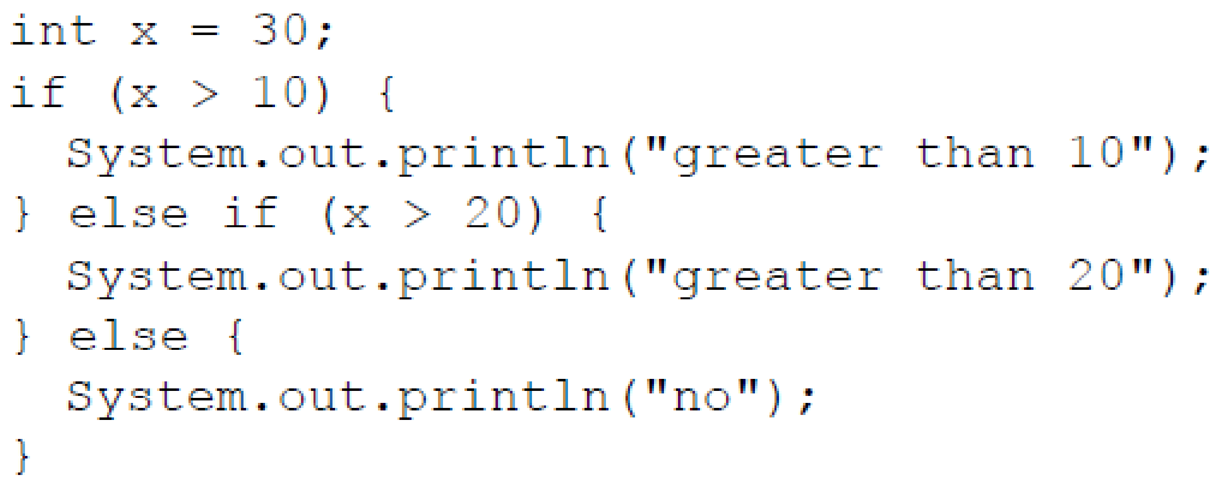
Question 1

- What is the output of this code fragment?

```
int x = 5;
if (x < 10) {
  System.out.println("less than 10");
} else if (x > 10) {
  System.out.println("greater than 10");
} else {
  System.out.println(“equals to 10 ");
}
```

Question 2

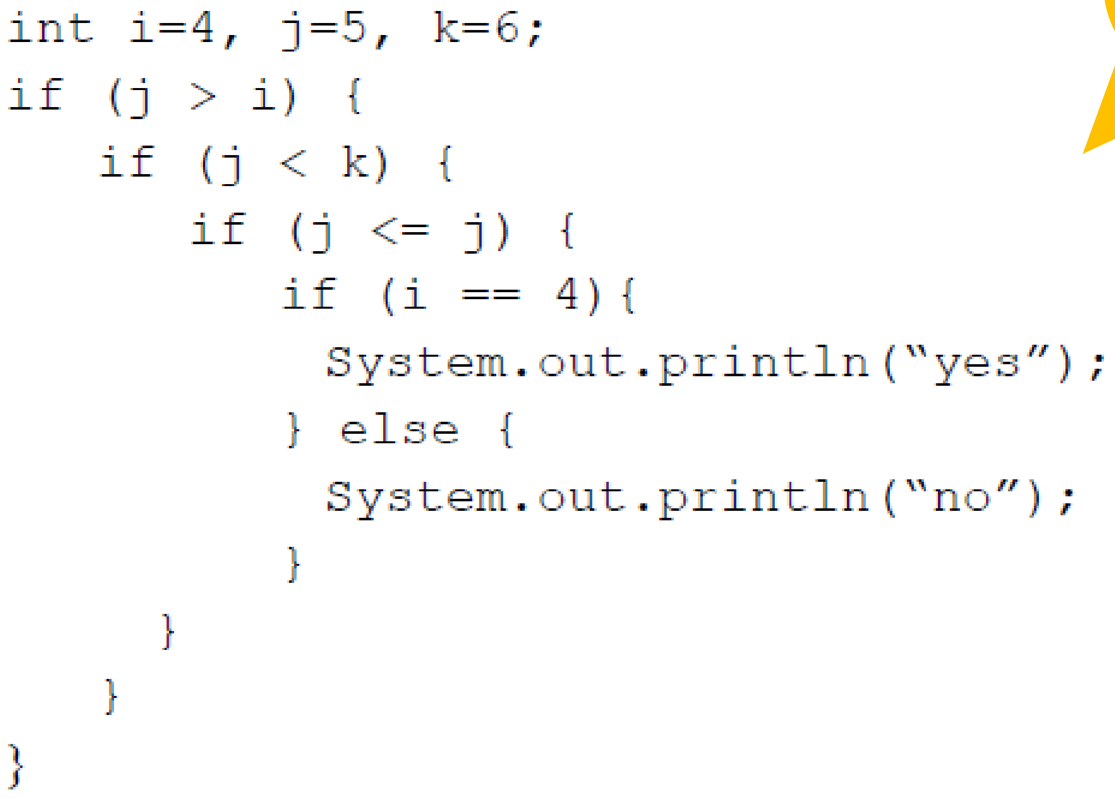
- What is the output of this code fragment?



```
int x = 30;
if (x > 10) {
  System.out.println("greater than 10");
} else if (x > 20) {
  System.out.println("greater than 20");
} else {
  System.out.println("no");
}
```

Question 3

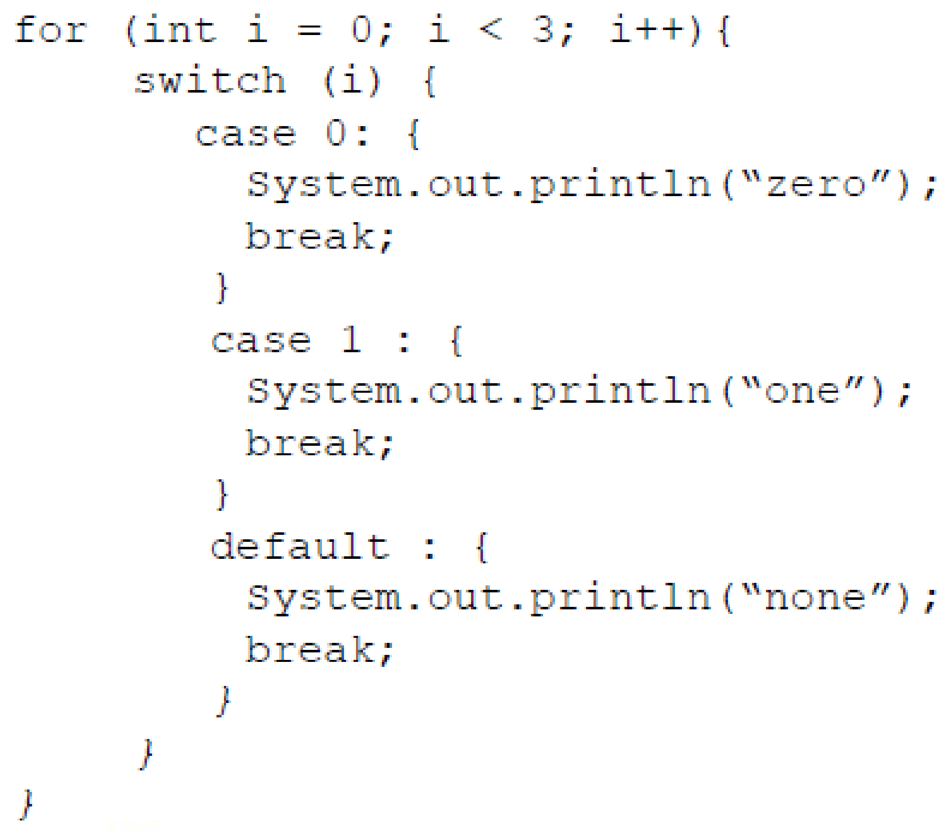
- What is the output of this code fragment?



```
int i=4, j=5, k=6;
if (j > i) {
    if (j < k) {
        if (j <= j) {
            if (i == 4){
              System.out.println("yes");
            } else {
              System.out.println("no");
            }
        }
    }
}
```

Question 4

- What is the output of this code fragment?



```
for (int i = 0; i < 3; i++){
      switch (i) {
         case 0: {
           System.out.println(“zero”);
           break;
          }
          case 1 : {
           System.out.println(“one”);
           break;
          }
          default : {
           System.out.println(“none”);
           break;
          }
      }
}
```

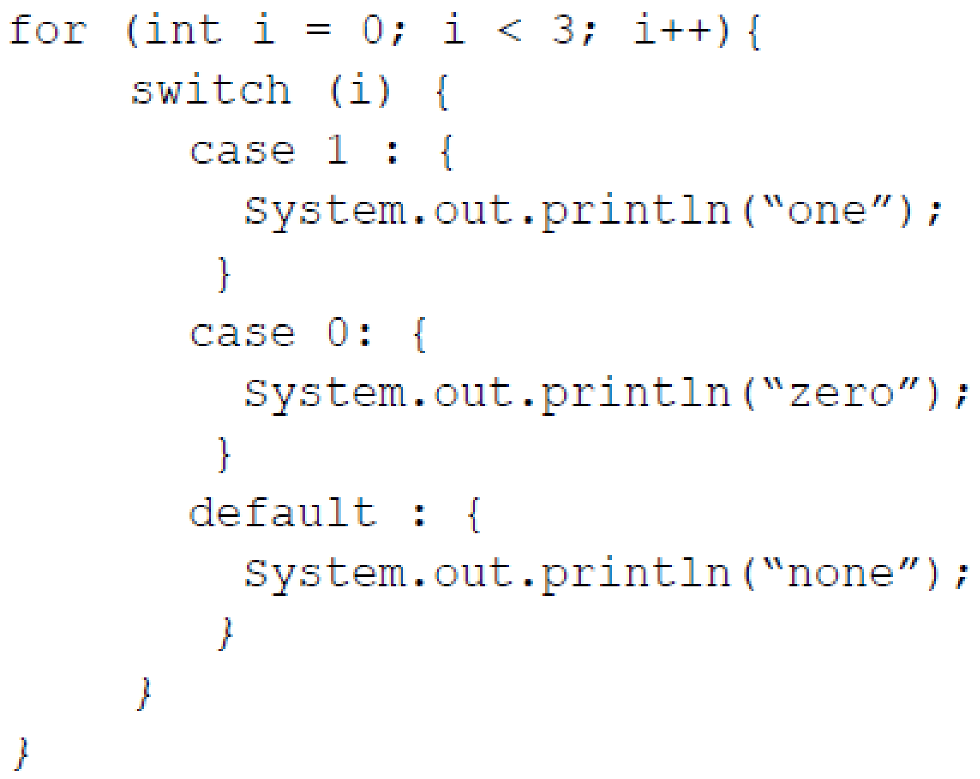
Question 5

- What is the output of this code fragment?

```
for (int i = 0; i < 3; i++){
     switch (i) {
        case 0: {
          System.out.println(“zero”);
         }
         case 1 : {
          System.out.println(“one”);
         }
         default : {
          System.out.println(“none”);
         }
     }
}
```

Question 6

- What is the output of this code fragment?



```
for (int i = 0; i < 3; i++){
     switch (i) {
        case 1 : {
          System.out.println(“one”);
         }
        case 0: {
          System.out.println(“zero”);
         }
        default : {
          System.out.println(“none”);
         }
     }
}
```

Questions 7+8

- Write a Java program that calculates the sum of integers in the range **1** to **100** (*inclusive*).

- Write a Java program that produces a multiplication table, showing the results of multiplying the integers **1** through to **3**. The output of your program should look as follows:

```
1  2  3
2  4  6
3  6  9
```

Questions 9+10

- What will be printed out using the following code?

```java
class Question2c {
  public static void main(String[] args) {
    int i=8, j=9;
    boolean test;
    test=i>7&&j-- > i++;
    System.out.println(i);
    System.out.println(j);
    System.out.println(test);
  }
}
```

⇔

```java
test=(i>7)&&(j>i);
j=j-1;
i=i+1;
```

- Write a block of code that calculates the sum of all the integers divisible by **3**, in the range **1** to **99** (*inclusive*). You are not required to write a complete program.

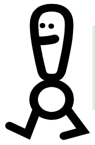
Exercise: Fill in the Gaps

- Consider the incomplete Java program `StarsTriangle`; it displays the pattern below, when it is compiled and run.
- Your challenge is to use the collection of statements on the far right, together with some extra right brackets (`}`), to complete the program `StarsTriangle`.

```
public class StarsTriangle {
  public static void main(String[] args) {
    // code missing
  }
}
```

```
*
**
***
****
*****
******
*******
********
```

```
col = col + 1;
int col = 0;
int row = 0;
int size = 8;
row = row + 1;
row = 0;
System.out.print('*');
System.out.println('*');
System.out.println();
while (col <= row) {
while (col < row) {
while (row < size) {
while (row <= size) {
col = 0;
```



Some of the statements may not be necessary!

Exercise: Predict the Question

- Determine the question that should result in the following possible answers:

Answer 1

"This happens when a class has multiple methods with the same name but different lists of parameters. It helps ensure consistency when naming methods."

Answer 2

"Methods in the same class that share the same name but accept different variable types as arguments. Such methods give programmers the flexibility to call a similar method with different types of data."