Algoritma dan Pemrograman
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10

Control Flow – Branching

- This control has three statements, as follow:
  1. Break
  2. Continue
  3. Return

break statement

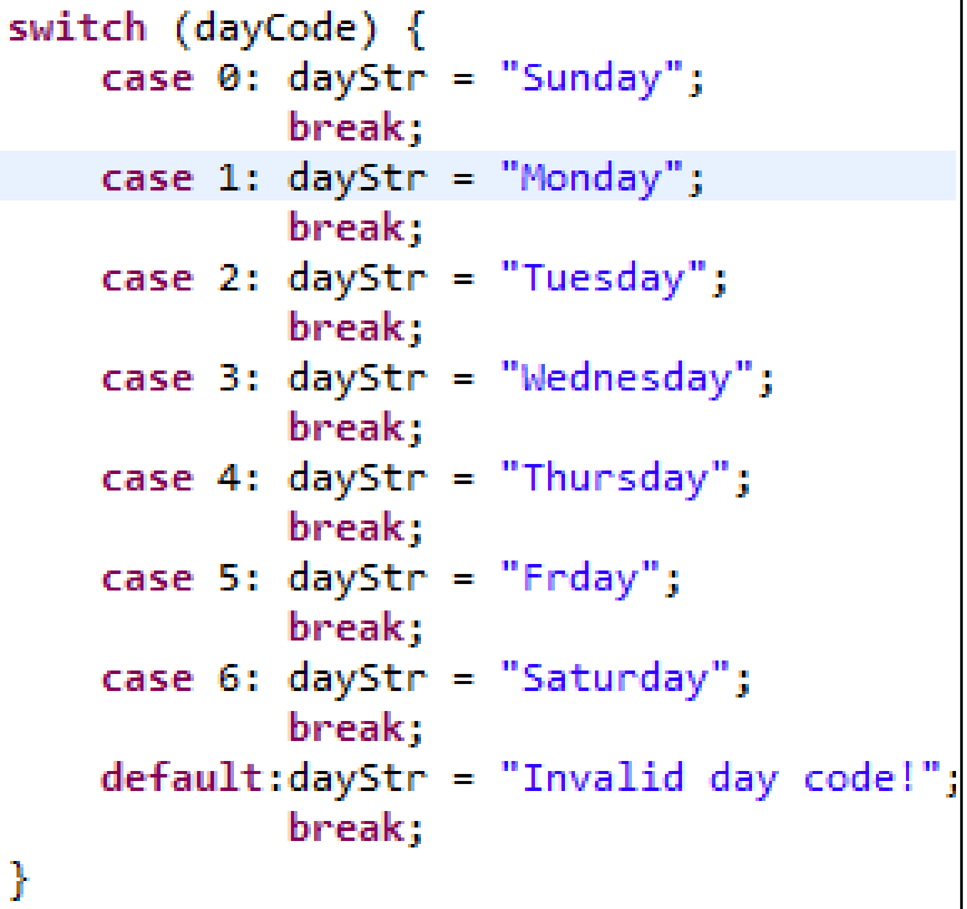
- As the name says, Break Statement is generally used to break the loop or switch statement.
- The break statement has two forms: labeled and unlabeled.
- You can also use an unlabeled break to terminate a for, while, or do-while loop, as shown in the following BreakDemo program:

Branch statement

- the branching statements (break, continue, return) supported by the Java programming language.
- Branching/Transfer/Jump

Unlabeled break statement

- The unlabeled version of the break statement is used when we want to jump out of a single loop or single case in switch statement.
- You saw the unlabeled form in the previous discussion of the switch statement.

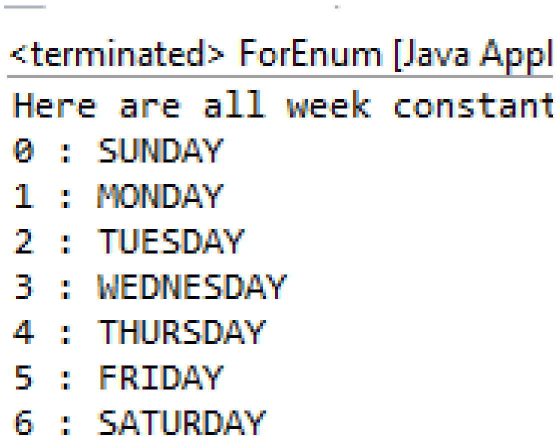


```
switch (dayCode) {
    case 0: dayStr = "Sunday";
            break;
    case 1: dayStr = "Monday";
            break;
    case 2: dayStr = "Tuesday";
            break;
    case 3: dayStr = "Wednesday";
            break;
    case 4: dayStr = "Thursday";
            break;
    case 5: dayStr = "Frday";
            break;
    case 6: dayStr = "Saturday";
            break;
    default:dayStr = "Invalid day code!";
            break;
}
```

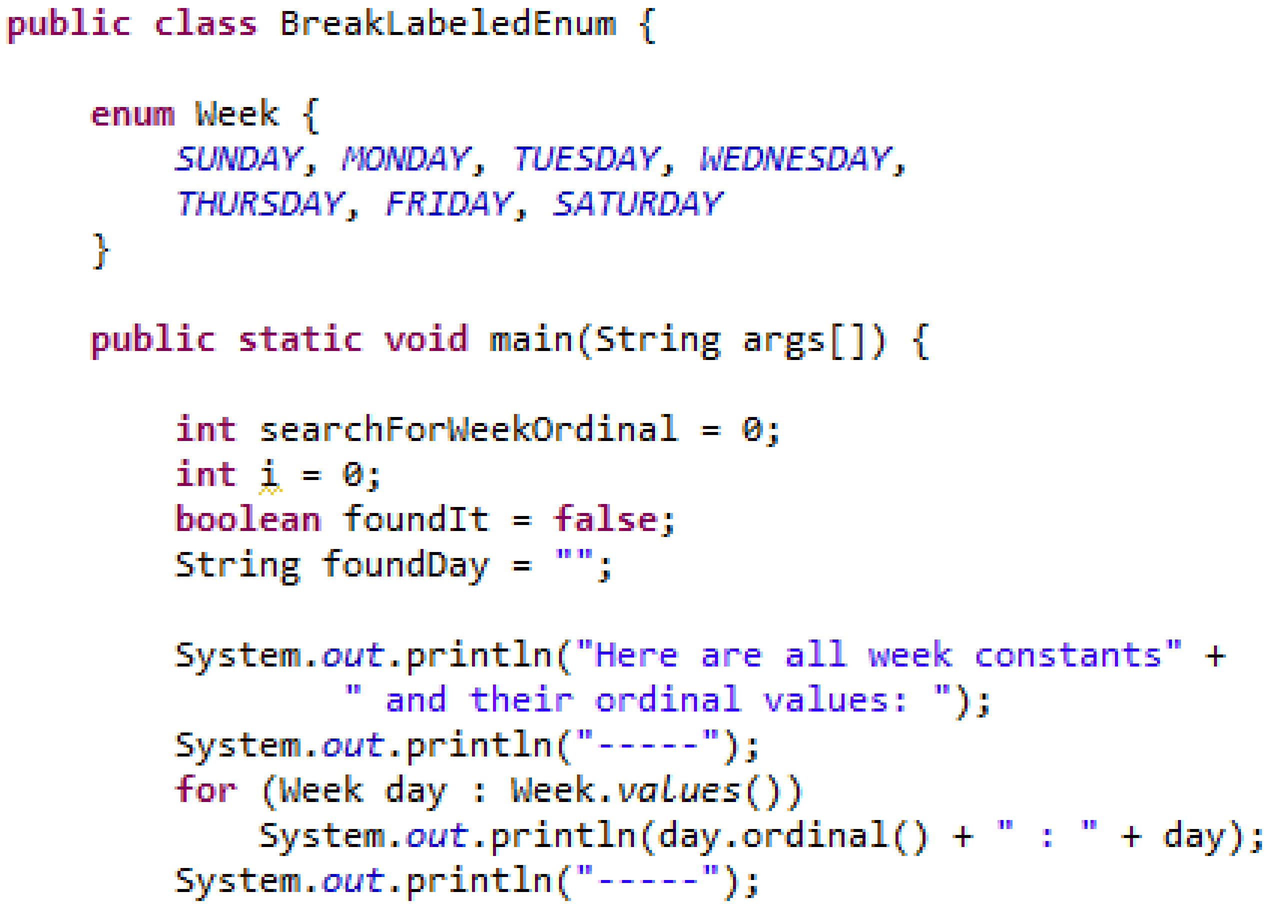
Labeled break statement

- Labeled version of the break statement is used when we want to jump out of nested or multiple loops.

Class BreakLabeledEnum 1/3

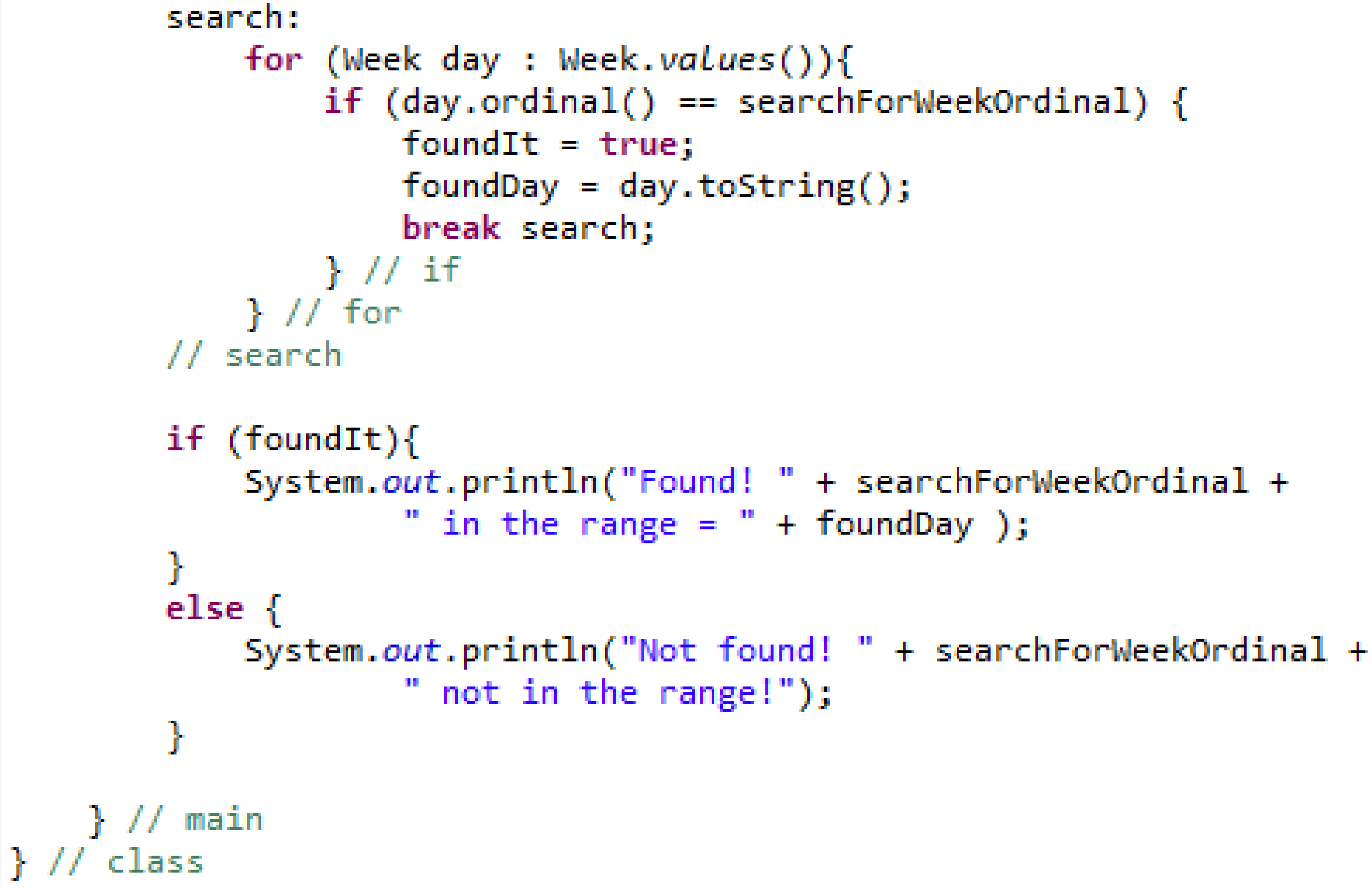


```
<terminated> ForEnum [Java Appl
Here are all week constant
0 : SUNDAY
1 : MONDAY
2 : TUESDAY
3 : WEDNESDAY
4 : THURSDAY
5 : FRIDAY
6 : SATURDAY
```



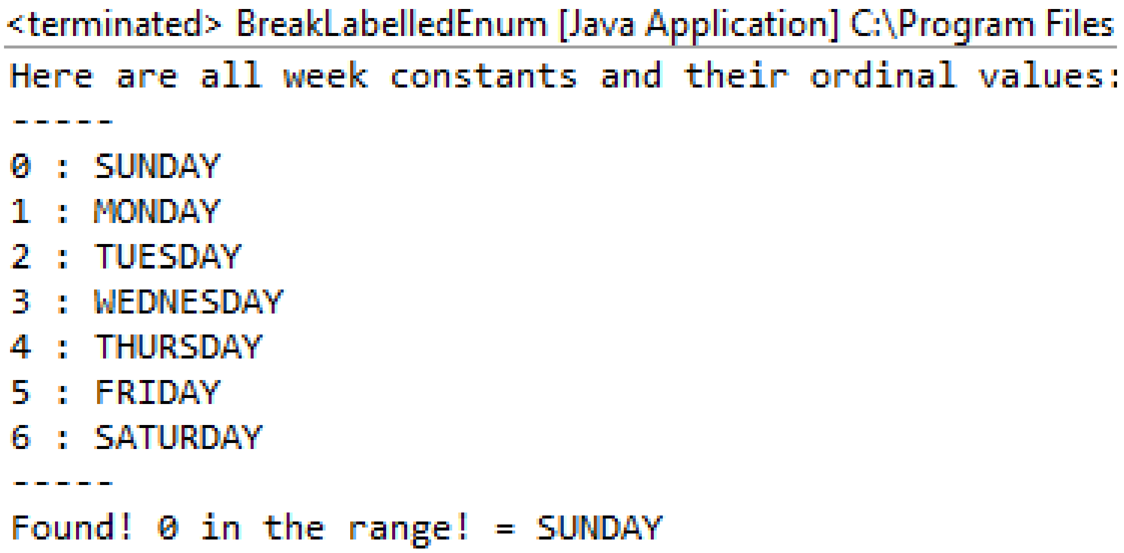
```java
public class BreakLabeledEnum {

    enum Week {
        SUNDAY, MONDAY, TUESDAY, WEDNESDAY,
        THURSDAY, FRIDAY, SATURDAY
    }

    public static void main(String args[]) {

        int searchForWeekOrdinal = 0;
        int i = 0;
        boolean foundIt = false;
        String foundDay = "";

        System.out.println("Here are all week constants" +
                " and their ordinal values: ");
        System.out.println("-----");
        for (Week day : Week.values())
            System.out.println(day.ordinal() + " : " + day);
        System.out.println("-----");
```

Class BreakLabeledEnum 2/3



```
        search:
            for (Week day : Week.values()){
                if (day.ordinal() == searchForWeekOrdinal) {
                    foundIt = true;
                    foundDay = day.toString();
                    break search;
                } // if
            } // for
        // search

        if (foundIt){
            System.out.println("Found! " + searchForWeekOrdinal +
                    " in the range = " + foundDay );
        }
        else {
            System.out.println("Not found! " + searchForWeekOrdinal +
                    " not in the range!");
        }

    } // main
} // class
```

Class BreakLabeledEnum 3/3



```
<terminated> BreakLabelledEnum [Java Application] C:\Program Files
Here are all week constants and their ordinal values:
-----
0 : SUNDAY
1 : MONDAY
2 : TUESDAY
3 : WEDNESDAY
4 : THURSDAY
5 : FRIDAY
6 : SATURDAY
-----
Found! 0 in the range! = SUNDAY
```

Result

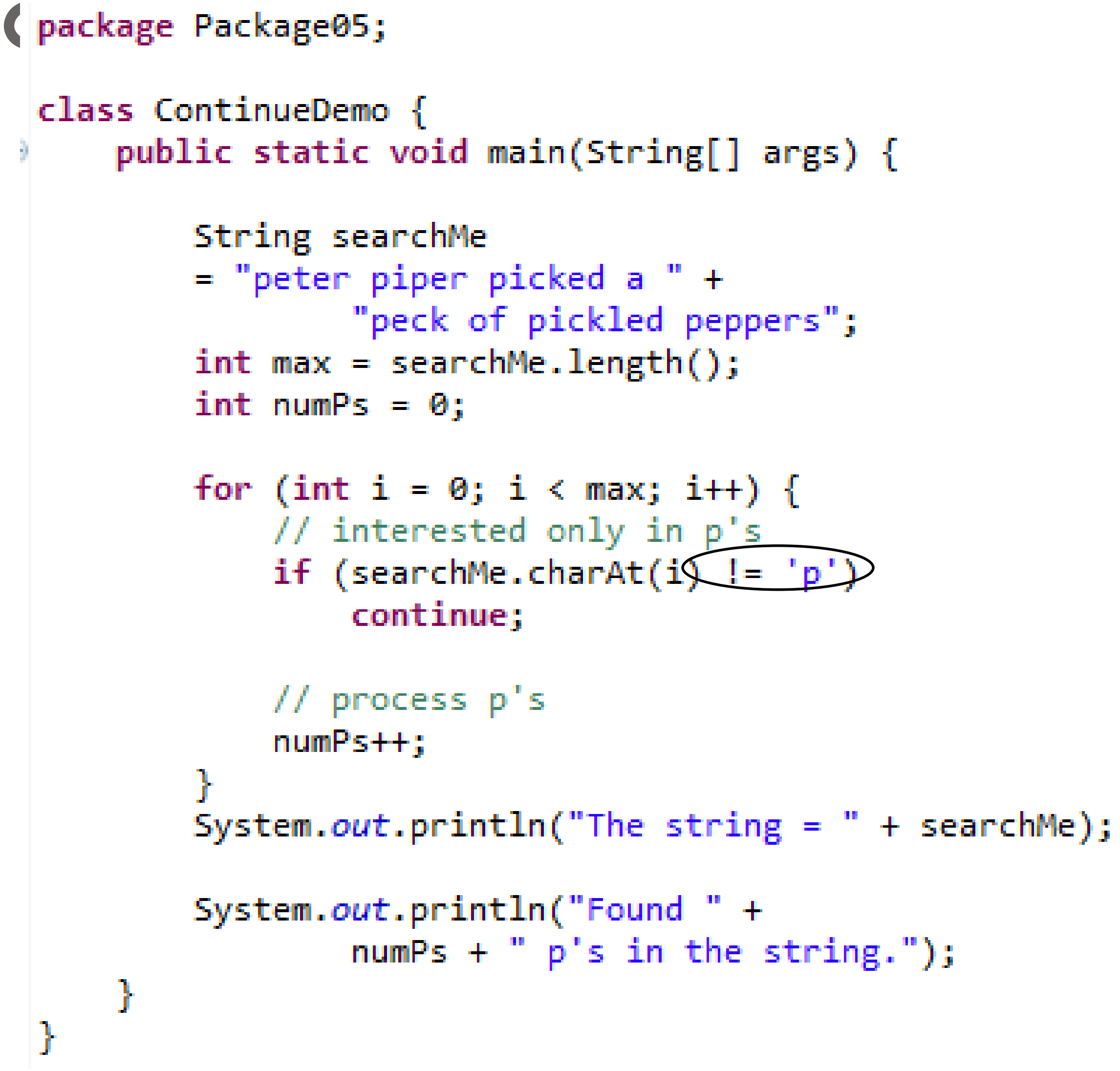
- This program searches for the ordinal = 0 in a range of days. The break statement, shown in boldface, terminates the for loop when that value is found. Control flow then transfers to the print statement at the end of the program. This program's output is:

    -
      ```
      Found! 0 in the range! = SUNDAY
      ```

continue statement

- Continue statement is used when we want to skip the rest of the statement in the body of the loop and continue with the next iteration of the loop.
- The *continue* keyword can be used in any of the loop control structures. It causes the loop to immediately jump to the next iteration of the loop.
- In a for loop, the continue keyword causes flow of control to immediately jump to the update statement.
- In a while loop or do/while loop, flow of control immediately jumps to the Boolean expression.
- There are two forms of continue statement in Java.
  1. Unlabeled Continue Statement
  2. Labeled Continue Statement

Unlabeled c

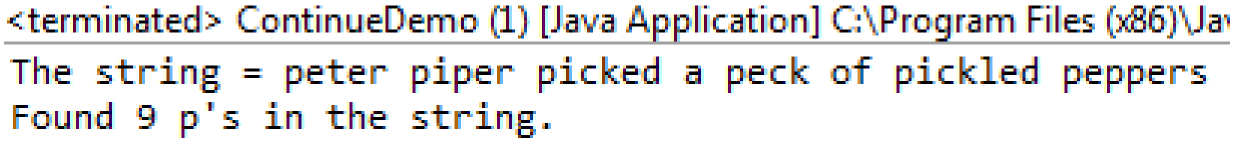


```
package Package05;

class ContinueDemo {
    public static void main(String[] args) {

        String searchMe
        = "peter piper picked a " +
                "peck of pickled peppers";
        int max = searchMe.length();
        int numPs = 0;

        for (int i = 0; i < max; i++) {
            // interested only in p's
            if (searchMe.charAt(i) != 'p')
                continue;

            // process p's
            numPs++;
        }
        System.out.println("The string = " + searchMe);

        System.out.println("Found " +
                numPs + " p's in the string.");
    }
}
```

`length()` : Returns the the length of the sequence of characters (given string).

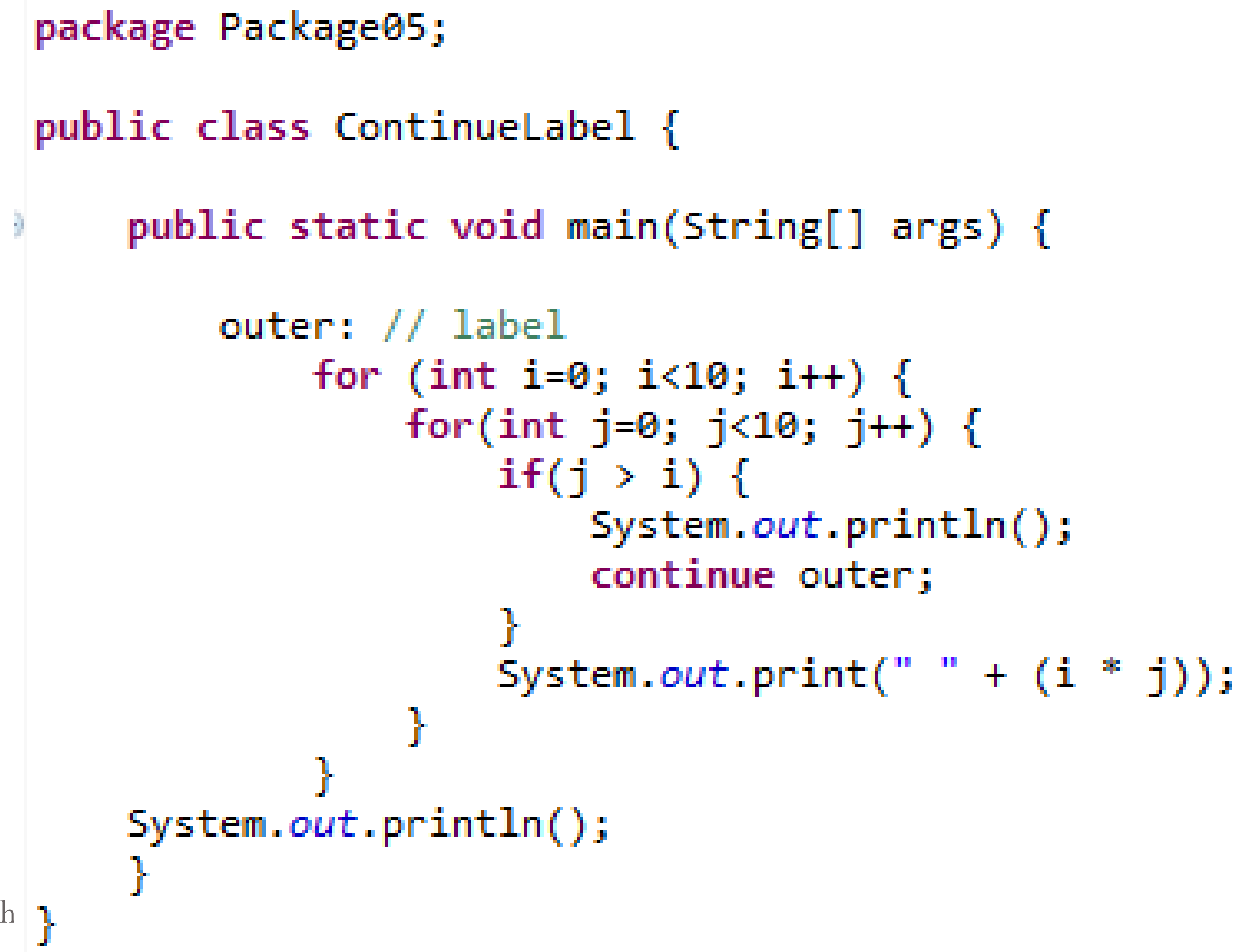
TIP - String class is zero-indexed, the range *0..**n**-1*

Unlabeled `continue` statement



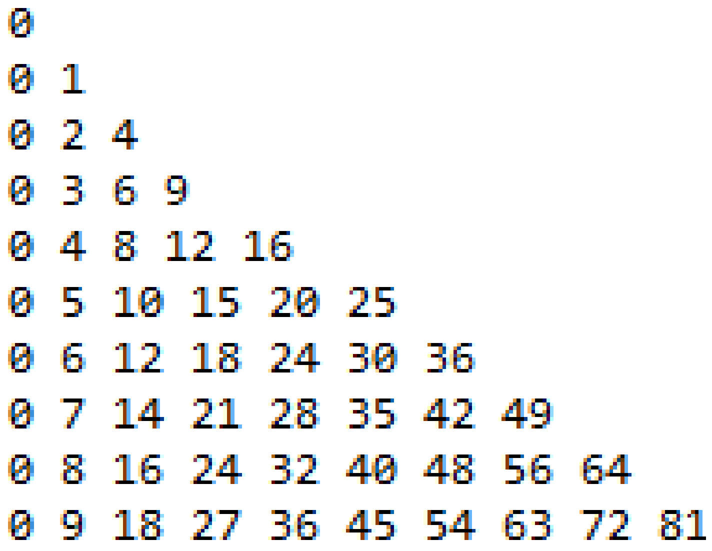
```
<terminated> ContinueDemo (1) [Java Application] C:\Program Files (x86)\Ja
The string = peter piper picked a peck of pickled peppers
Found 9 p's in the string.
```

Labeled `continue` statement



```java
package Package05;

public class ContinueLabel {

    public static void main(String[] args) {

        outer: // label
            for (int i=0; i<10; i++) {
                for(int j=0; j<10; j++) {
                    if(j > i) {
                        System.out.println();
                        continue outer;
                    }
                    System.out.print(" " + (i * j));
                }
            }
    System.out.println();
    }
}
```

- Here is an example program that uses **continue** to print a triangular multiplication table for 0 through 9.

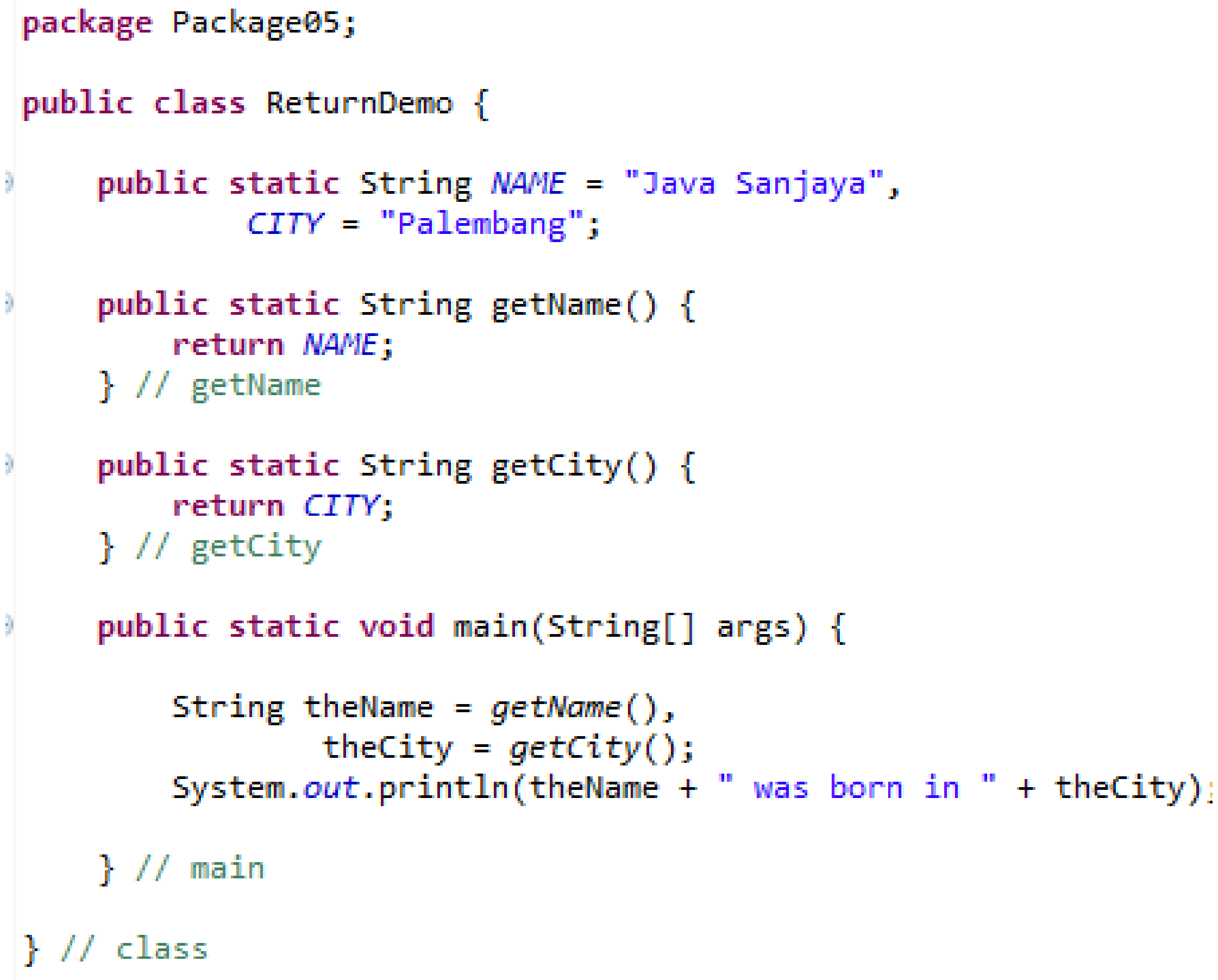


```
0
0 1
0 2 4
0 3 6 9
0 4 8 12 16
0 5 10 15 20 25
0 6 12 18 24 30 36
0 7 14 21 28 35 42 49
0 8 16 24 32 40 48 56 64
0 9 18 27 36 45 54 63 72 81
```

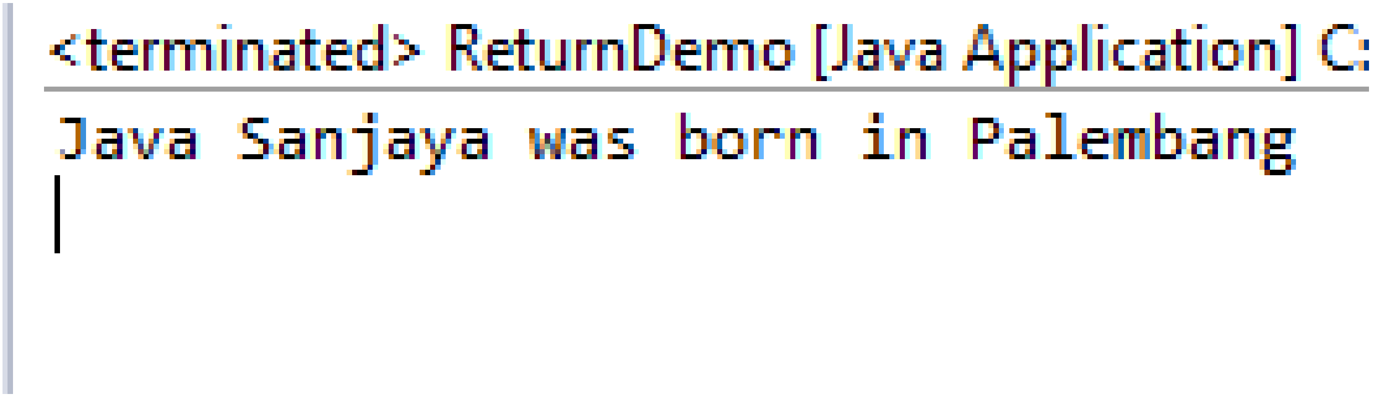
`return` statement

- The **return** statement is used to explicitly return from a method. That is, it causes program control to transfer back to the caller of the method. As such, it is categorized as a jump statement

Return



```
package Package05;

public class ReturnDemo {

    public static String NAME = "Java Sanjaya",
            CITY = "Palembang";

    public static String getName() {
        return NAME;
    } // getName

    public static String getCity() {
        return CITY;
    } // getCity

    public static void main(String[] args) {

        String theName = getName(),
                theCity = getCity();
        System.out.println(theName + " was born in " + theCity);

    } // main

} // class
```



```
<terminated> ReturnDemo [Java Application] C:
Java Sanjaya was born in Palembang
```