Text Output in Python and Java

Problem statement: Analyze the following code in Python and in Java. Both produce the same output. Match each line of output with a line of code that produces it and then answer the questions on the next page.

Python code: `text_output.py`

```python
1  print("Hello World!")
2
3  #print by default adds a new line after the text
4  print("Welcome to ")
5  print("cs101")
6  #we can change this by specifying a different line ending
7  print("Welcome to ", end='')
8  print("cs101")
9
10 #printing content of variables
11 word1 = "one"
12 word2 = "two"
13 print(word1, word2, "three")
14
15 number1 = 1
16 number2 = 2
17 print(number1, number2, "3")
18 print(str(number1) + str(number2) + "3")
19
20 #formatting floating pointnumbers and strings
21 semester_salary = 2035
22 weekly_salary = semester_salary/14
23 print ("Semester salary is", semester_salary)
24 print ("Weekly salary is", weekly_salary)
25 print ("Semester salary is", format(semester_salary, ".2f"))
26 print ("Weekly salary is", format(weekly_salary, ".2f"))
27 print ("Semester salary is", format(semester_salary, "9.2f"))
28 print ("Weekly salary is", format(weekly_salary, "9.2f"))
29 print (format("Semester salary is", "20s"), format(semester_salary, "9.2f"))
30 print (format("Weekly salary is", "20s"), format(weekly_salary, "9.2f"))
31 print (format("Semester salary is", "20s"), format(semester_salary, "9,.2f"))
32 print (format("Weekly salary is", "20s"), format(weekly_salary, "9,.2f"))
33
34 #formatting integers
35 large_number = 123456
36 print( format(large_number, "10,d"))
37 print( format(12*large_number, "10,d"))
38 print( format(-30*large_number, "10,d"))
```

Java code: `TextOutput.java`

```java
public class TextOutput {
  public static void main( String [] args) {
    System.out.println("Hello World!");

    //print by default adds a new line after the text
    System.out.println("Welcome to ");
    System.out.println("cs101");
    //we can change this by specifying a different line ending
    System.out.print("Welcome to ");
    System.out.println("cs101") ;

    //printing content of variables
    String word1 = "one";
    String word2 = "two";
    System.out.println(word1 + word2 + "three") ;

    int number1 = 1;
    int number2 = 2;
    System.out.println(number1 + " " + number2 + " 3");
    System.out.println(number1 + "" + number2 + "3");

    //formatting floating pointnumbers and strings
    double semester_salary = 2035;
    double weekly_salary = semester_salary/14;
    System.out.println ("Semester salary is " + (int)semester_salary);
    System.out.println ("Weekly salary is " + weekly_salary);
    System.out.printf ("Semester salary is %.2f\n" , semester_salary);
    System.out.printf ("Weekly salary is %.2f\n", weekly_salary);
    System.out.printf ("Semester salary is %9.2f\n", semester_salary);
    System.out.printf ("Weekly salary is  %9.2f\n", weekly_salary);
    System.out.printf ("%-20s %9.2f\n", "Semester salary is", semester_salary);
    System.out.printf ("%-20s %9.2f\n", "Weekly salary is", weekly_salary);
    System.out.printf ("%-20s %,9.2f\n", "Semester salary is", semester_salary);
    System.out.printf ("%-20s %,9.2f\n", "Weekly salary is", weekly_salary);

    //formatting integers
    int large_number = 123456;
    System.out.printf("%,10d\n", large_number);
    System.out.printf("%,10d\n", 12*large_number);
    System.out.printf("%,10d\n", -30*large_number);
  }
}
```

Output:

```
Hello World!
Welcome to
cs101
Welcome to cs101
onetwothree
1 2 3
123
Semester salary is 2035
Weekly salary is 145.35714285714286
Semester salary is 2035.00
Weekly salary is 145.36
Semester salary is    2035.00
Weekly salary is      145.36
Semester salary is      2035.00
Weekly salary is         145.36
Semester salary is    2,035.00
Weekly salary is         145.36
   123,456
 1,481,472
-3,703,680
```

Questions:

1. What statement is used to print a simple string ending with the newline character in Python and in Java?

2. What statement is used to print a simple string without the newline character in Python and in Java?

3. How do you print the value of a `String` variable concatenated with another string?

4. How do you print the value of an `int` variable concatenated with a string?

5. Compare ways of formatting floating point numbers in Python and in Java.

    (a) How do you control number of digits after the decimal point?

    (b) How do you control minimum number of spaces used for displaying the number?

    (c) How do you print a comma separating every three digits in a number, like `2,035.00`?

6. Compare ways of formatting integers and strings in Python and in Java.

    (a) How do you control minimum number of spaces used for displaying numbers or strings?

    (b) How do you print a comma separating every three digits in an integer?