

Java Formatting Output Tutorial

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Time required: 30 minutes

Online Tutorial

Go through the following tutorials.

- [Java String Format](#)

Java String Format Specifiers

Format Specifier	Data Type	Output
%a	floating point (except BigDecimal)	Returns Hex output of floating point number.
%b	Any type	"true" if non-null, "false" if null
%c	character	Unicode character
%d	integer (incl. byte, short, int, long, bigint)	Decimal Integer
%e	floating point	decimal number in scientific notation
%f	floating point	decimal number
%g	floating point	decimal number, possibly in scientific notation depending on the precision and value.
%h	any type	Hex String of value from hashCode() method.

%o	integer (incl. byte, short, int, long, bigint)	Octal number
%s	any type	String value
%t	Date/Time (incl. long, Calendar, Date and TemporalAccessor)	%t is the prefix for Date/Time conversions. More formatting flags are needed after this. See Date/Time conversion below.
%x	integer (incl. byte, short, int, long, bigint)	Hex string.

Tutorial 1.1: Number Formatting

printf does not include a line return like **println** does. Insert the new line escape character **\n** at the end of a statement to get a new line.

Create a Java program named: **PrintfNumberFormatting.java**

```

1  /**
2   * Name: PrintfNumberFormatting.java
3   * Written by:
4   * Written on:
5   * Purpose: How to print formatted numbers in Java
6   */
7
8  public class PrintfNumberFormatting {
9      public static void main(String[] args) {
10         // % - Replaced by variable
11         // .1 - precision
12         // f - floating point
13         // \n - new line
14         System.out.printf("%.1f\n", Math.PI);
15         System.out.printf("%.2f\n", Math.PI);
16         System.out.printf("%.3f\n", Math.PI);
17         System.out.printf("%.4f\n", Math.PI);
18         System.out.printf("%.5f\n", Math.PI);
19
20         int x = 100;
21         // d - integer
22         System.out.printf(
23             "Printing simple integer: x = %d\n", x);
24
25         // this will print it up to 2 decimal places
26         System.out.printf(
27             "Formatted with precision: PI = %.2f\n",
28             Math.PI);
29
30         float n = 5.2f;
31         // automatically appends zero to the rightmost part
32         // of decimal
33         System.out.printf(
34             "Formatted to specific width: n = %.4f\n", n);
35
36         double currency = 2324435.3;
37         // Number is formatted with commas
38         System.out.printf(
39             "Formatted to currency: $%,.2f\n", currency);
40
41         double a = 35.55845;
42         double b = 40.1245414;
43         // printf with 2 variables
44         System.out.printf("Format 2 numbers: a = %.2f b = %.4f", a, b);
45     }
46 }

```

Example run:

```
3.1
3.14
3.142
3.1416
3.14159
Printing simple integer: x = 100
Formatted with precision: PI = 3.14
Formatted to specific width: n = 5.2000
Formatted to currency: $2,324,435.30
Format 2 numbers: a = 35.56 b = 40.1245
```

Tutorial 1.2: DiscountPrice with Format

System.out.format behaves much the same as **printf**.

Create a Java program named **DiscountPrice.java**

```
1  /*
2   * Name: DiscountPrice.java
3   * Written by:
4   * Written on:
5   * Purpose: Calculate a 15% discount on a price
6   */
7
8  import java.util.Scanner;
9
10 public class DiscountPrice {
11     public static void main(String[] args) {
12         Scanner input = new Scanner(System.in);
13         double price;
14         double discountPrice;
15
16         System.out.print("Enter the price: ");
17
18         price = input.nextDouble();
19         discountPrice = price * 0.85;
20
21         // %.2f is replaced by discountPrice display to two decimals
22         // % is a format specifier, if you want to print a %, you have to put %%
23         System.out.format("Your price is $%.2f after 15%% discount.\n", discountPrice);
24         // Close scanner OS resources
25         input.close();
26     }
27 }
```

Example run:

```
Enter the price: 22.36
Your price is $19.01 after 15% discount.
```

Assignment Submission

1. Attach the pseudocode.
2. Attach the program files.
3. Attach screenshots showing the successful operation of the program.
4. Submit in Blackboard.