## String Formatting

The most common way of formatting a string in java is using *[String.format()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "format-java.lang.String-java.lang.Object...-" \t "_blank)*. If there were a “java sprintf” then this would be it.



1

String output = String.format("%s = %d", "joe", 35);

For formatted console output, you can use *[printf()](https://docs.oracle.com/javase/8/docs/api/java/io/PrintStream.html" \l "printf-java.lang.String-java.lang.Object...-" \t "_blank)* or the [*format()*](https://docs.oracle.com/javase/8/docs/api/java/io/PrintStream.html#format-java.lang.String-java.lang.Object...-) method of *[System.out](https://docs.oracle.com/javase/8/docs/api/java/lang/System.html" \l "out" \t "_blank)* and *[System.err](https://docs.oracle.com/javase/8/docs/api/java/lang/System.html" \l "err" \t "_blank)* PrintStreams.



1

System.out.printf("My name is: %s%n", "joe");

Create a [*Formatter*](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html)and link it to a [*StringBuilder*](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuilder.html). Output formatted using the [*format()*](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#format-java.lang.String-java.lang.Object...-) method will be appended to the StringBuilder.

StringBuilder sbuf = new StringBuilder();

2

Formatter fmt = new Formatter(sbuf);

3

fmt.format("PI = %f%n", Math.PI);

4

System.out.print(sbuf.toString());

5

// you can continue to append data to sbuf here.

## Format Specifiers

Here is a quick reference to all the conversion specifiers supported:

| **SPECIFIER** | **APPLIES TO** | **OUTPUT** |
| --- | --- | --- |
| %a | floating point (except *[BigDecimal](https://docs.oracle.com/javase/8/docs/api/java/math/BigDecimal.html" \t "_blank)*) | 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. |
| %n | none | Platform-specific line separator. |
| %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. |

| **FLAG** | **NOTES** |
| --- | --- |
| %tA | Full name of the day of the week, e.g. “Sunday“, “Monday“ |
| %ta | Abbreviated name of the week day e.g. “Sun“, “Mon“, etc. |
| %tB | Full name of the month e.g. “January“, “February“, etc. |
| %tb | Abbreviated month name e.g. “Jan“, “Feb“, etc. |
| %tC | Century part of year formatted with two digits e.g. “00” through “99”. |
| %tc | Date and time formatted with “%ta %tb %td %tT %tZ %tY” e.g. “Fri Feb 17 07:45:42 PST 2017“ |
| %tD | Date formatted as “%tm/%td/%ty“ |
| %td | Day of the month formatted with two digits. e.g. “01” to “31“. |
| %te | Day of the month formatted without a leading 0 e.g. “1” to “31”. |
| %tF | ISO 8601 formatted date with “%tY-%tm-%td“. |
| %tH | Hour of the day for the 24-hour clock e.g. “00” to “23“. |
| %th | Same as %tb. |
| %tI | Hour of the day for the 12-hour clock e.g. “01” – “12“. |
| %tj | Day of the year formatted with leading 0s e.g. “001” to “366“. |
| %tk | Hour of the day for the 24 hour clock without a leading 0 e.g. “0” to “23“. |
| %tl | Hour of the day for the 12-hour click without a leading 0 e.g. “1” to “12“. |
| %tM | Minute within the hour formatted a leading 0 e.g. “00” to “59“. |
| %tm | Month formatted with a leading 0 e.g. “01” to “12“. |
| %tN | Nanosecond formatted with 9 digits and leading 0s e.g. “000000000” to “999999999”. |
| %tp | Locale specific “am” or “pm” marker. |
| %tQ | Milliseconds since epoch Jan 1 , 1970 00:00:00 UTC. |
| %tR | Time formatted as 24-hours e.g. “%tH:%tM“. |
| %tr | Time formatted as 12-hours e.g. “%tI:%tM:%tS %Tp“. |
| %tS | Seconds within the minute formatted with 2 digits e.g. “00” to “60”. “60” is required to support leap seconds. |
| %ts | Seconds since the epoch Jan 1, 1970 00:00:00 UTC. |
| %tT | Time formatted as 24-hours e.g. “%tH:%tM:%tS“. |
| %tY | Year formatted with 4 digits e.g. “0000” to “9999“. |
| %ty | Year formatted with 2 digits e.g. “00” to “99“. |
| %tZ | Time zone abbreviation. e.g. “UTC“, “PST“, etc. |
| %tz | Time Zone Offset from GMT e.g. “  -0800  “. |

### Date and Time Formatting

Note: Using the formatting characters with “%T” instead of “%t” in the table below makes the output uppercase.

## Argument Index

An argument index is specified as a number ending with a “$” after the “%” and selects the specified argument in the argument list.



1

String.format("%2$s", 32, "Hello"); // prints: "Hello"

## Formatting an Integer

With the %d format specifier, you can use an argument of all integral types including byte, short, int, long and BigInteger.

Default formatting:



1

String.format("%d", 93); // prints 93

Specifying a width:



1

String.format("|%20d|", 93); // prints: | 93|

Left-justifying within the specified width:



1

String.format("|%-20d|", 93); // prints: |93 |

Pad with zeros:



1

String.format("|%020d|", 93); // prints: |00000000000000000093|

Print positive numbers with a “+”:

(Negative numbers always have the “-” included):



1

String.format("|%+20d|', 93); // prints: | +93|

A space before positive numbers.

A “-” is included for negative numbers as per normal.



1

String.format("|% d|", 93); // prints: | 93| String.format("|% d|", -36); // prints: |-36|

Use locale-specific thousands separator:

For the US locale, it is “,”:



1

String.format("|%,d|", 10000000); // prints: |10,000,000|

Enclose negative numbers within parentheses (“()”) and skip the "-":



1

String.format("|%(d|", -36); // prints: |(36)|

Octal output:



1

String.format("|%o|"), 93); // prints: 135

Hex output:



1

String.format("|%x|", 93); // prints: 5d

Alternate representation for octal and hex output:

Prints octal numbers with a leading “0” and hex numbers with leading “0x“.



1

String.format("|%#o|", 93);

2

// prints: 0135

3

​

4

String.format("|%#x|", 93);

5

// prints: 0x5d

6

​

7

String.format("|%#X|", 93);

8

// prints: 0X5D

## String and Character Conversion

Default formatting:

Prints the whole string.



1

String.format("|%s|", "Hello World"); // prints: "Hello World"

Specify Field Length



1

String.format("|%30s|", "Hello World"); // prints: | Hello World|

Left Justify Text



1

String.format("|%-30s|", "Hello World"); // prints: |Hello World |

Specify Maximum Number of Characters



1

String.format("|%.5s|", "Hello World"); // prints: |Hello|

Field Width and Maximum Number of Characters



1

String.format("|%30.5s|", "Hello World"); | Hello|