

Java - For

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<https://github.com/wbombardellis/java-unterricht>

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Organization

1 For

2 Summary

For

- Write a program that prints all integer numbers up to 1000

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```
for (int i = 0; i <= 1000; i + +) {  
    System.out.println(i);  
}
```

Simulations

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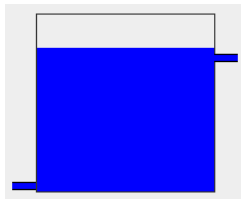
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Exercises

- 1 Complete the simulation program (from <https://github.com/wbombardellis/java-unterricht/tree/master/Programme/09/simulation>)

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- 2 Write a program that calculates the factorial of a number. The factorial of a positive integer n , denoted by $n!$, is $n \cdot n - 1 \cdot n - 2 \cdots 1$. Additionally, $0! = 1$.

For Grammar Rules

```
for (⟨Statement 1⟩; ⟨Boolean Condition⟩; ⟨Statement 3⟩) {  
    ...  
}
```

- *Statement 1* is executed (one time) before the execution of the code block.
- *Boolean Condition* defines the condition for executing the code block.
- *Statement 3* is executed (every time) after the code block has been executed.

Exercises

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$$\sum_{n=1}^N z^n$$

for any z . Verify that, for $z = \frac{1}{2}$, it converges to 1 as $N \rightarrow \infty$.

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- 2 Extend the previous program to also calculate the alternating harmonic series $\sum_{n=1}^N \frac{(-1)^{n-1}}{n}$ and verify that it converges to $\ln(2)$ as $N \rightarrow \infty$.

Exercises

- 3 Write a program that prints the following pattern up to a desired N.

```
1
1 2
1 2 3
1 2 3 4
⋮
1 2 3 4 5 ... N
```

Summary

- For allows you to execute the same code several times
- Next Lesson: Collections and for-each

References

- W3C Tutorial:
 - https://www.w3schools.com/java/java_for_loop.asp
- Exercises:
 - <https://www.w3schools.com/java/exercise.asp>
 - Java Loops