Java - For

William Bombardelli

Schweizerschule Mexiko, Ciudad de México, Mexico
https://github.com/wbombardellis/java-unterricht

22 January 2020

Organization

For

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

For

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

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

Simulations

- Physics
- Economics
- Biology
- Engineering
- Weather

W. Bombardelli
Schweizerschule Mexiko

Java

Simulations

- Physics
- Economics
- Biology
- Engineering
- Weather

Animation: `https://www.youtube.com/watch?v=YeYW8TIWLG8`
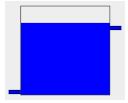Chaotic Systems:
`https://www.youtube.com/watch?v=d0Z8wLLPNE0`

Simulations

- Physics
- Economics
- Biology
- Engineering
- Weather

Animation: https://www.youtube.com/watch?v=YeYW8TIWLG8
Chaotic Systems:
https://www.youtube.com/watch?v=d0Z8wLLPNE0

Exercises

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

For Grammar Rules

for ($\langle$Statement 1$\rangle$; $\langle$Boolean Condition$\rangle$; $\langle$Statement 3$\rangle$) {
   ...
}

- *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

1. Write a program that calculates the geometric series

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

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

W. Bombardelli

Schweizerschule Mexiko

Java

Exercises

1 Write a program that calculates the geometric series

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

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

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 $N \to \infty$.

Exercises

1. Write a program that calculates the factorial of a number n, denoted by $n!$. The factorial of zero is 1. The factorial of a positive integer n is $n! = n \cdot (n-1) \cdot (n-2) \cdots 1$. Factorial is undefined for other numbers.

Exercises

1. Write a program that calculates the factorial of a number n, denoted by $n!$. The factorial of zero is 1. The factorial of a positive integer n is $n! = n \cdot (n-1) \cdot (n-2) \cdots 1$. Factorial is undefined for other numbers.

2. 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: Arrays

References

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