Lab: For Loop

Problems for exercise and homework for the "**Programming Basics**" course @ SoftUni Global.

Submit your solutions to the **SoftUni Judge** system at: https://judge.softuni.org/Contests/3693

1. Numbers from 1 to 100

Write a program that prints the numbers from 1 to 100, each on a new line.

Sample Input and Output

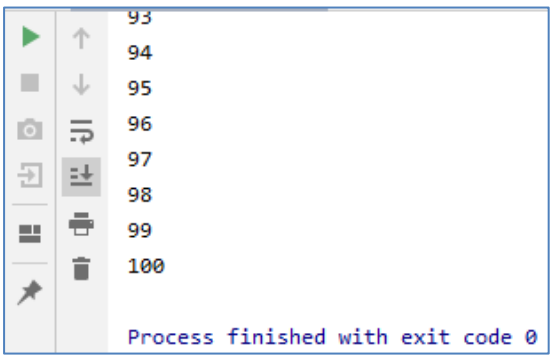
Input	Output
(no input)	1 2 3 … 98 99 100

Hints and Guidelines

1. Create a **for** loop with an initial value of the control variable **i = 1**. Make the end value less than or equal to **100**. In the block of the cycle code, print **i**:

```
public class Numbers1To100 {
    public static void main(String[] args) {
        for (int i = 1; i <= 100; i++) {
            System.out.println(i);
        }
    }
}
```

2. Start the program with [Ctrl+Shift+F10] and test it:



Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#0

2. Numbers N...1

Write a program that reads a positive integer **n** entered by the user and prints the numbers from **n** to **1** in reverse order. The number **n** entered will always be greater than 1.

Sample Input and Output

Input	Output
2	2 1

Input	Output
3	3 2 1

Input	Output
5	5 4 3 2 1

Hints and Guidelines

1. Read an integer from the console:

```
public static void main(String[] args) {
    Scanner scan = new Scanner(System.in);
    int n = Integer.parseInt(scan.nextLine());
}
```

2. Create one **for loop** from **n** to **0**, but instead of increasing the variable i by 1, **decrease it by 1 for each iteration of the loop**:

```
public static void main(String[] args) {
    Scanner scan = new Scanner(System.in);
    int n = Integer.parseInt(scan.nextLine());

    for (int i = n; i >= 1; i--) {

    }
}
```

3. Print the variable **i** in the body of the loop:

```
public static void main(String[] args) {
    Scanner scan = new Scanner(System.in);
    int n = Integer.parseInt(scan.nextLine());

    for (int i = n; i >= 1; i--) {
        System.out.println(i);
    }
}
```

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#1

3. Numbers 1...N with Step 3

Write a program that reads the number **n** entered by the user and prints the **numbers from 1 to n through 3.**

Sample Input and Output

Input	Output
10	1 4 7 10

Input	Output
7	1 4 7

Input	Output
15	1 4 7 10 13

Hints and Guidelines

1. Read an integer **n** from the console:

```
Scanner scan = new Scanner(System.in);
int n = Integer.parseInt(scan.nextLine());
```

2. Write a **for loop from 1 to n (inclusive) and set the step to 3**. This means that with each iteration of the loop, the variable i **will increase its value by 3 instead of 1:**

```
Scanner scan = new Scanner(System.in);
int n = Integer.parseInt(scan.nextLine());

for (int i = 1; i <= n; i += 3) {

}
```

3. Print the variable **i** in the body of the loop:

```
Scanner scan = new Scanner(System.in);
int n = Integer.parseInt(scan.nextLine());

for (int i = 1; i <= n; i += 3) {
    System.out.println(i);
}
```

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#2

4. Even Powers of 2

Write a program that reads the number **n** entered by the user and prints the even power of **2 ≤ 2^n**: **2^0**, **2^2**, **2^4**, **2^6**, …, **2^n**.

Sample Input and Output

Input	Output
3	1 4

Input	Output
4	1 4 16

Input	Output
5	1 4 16

Input	Output
6	1 4 16 64

Input	Output
7	1 4 16 64

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#3

5. Character Sequence

Write a program that reads text (string) entered by the user and prints each character of the text on a separate line.

Sample Input and Output

Input	Output	Input	Output
softuni	s o f t u n i	ice cream	i c e c r e a m

Hints and Guidelines

1. Read the input text:

```
Scanner scan = new Scanner(System.in);
String input = scan.nextLine();
```

2. Write a **for loop** with an initial value of the control variable from **0** to **input.length()**. On each iteration, take the letter at the position in the entered word equal to the value of the control variable **i**, using the method **charAt()**

```
for (int i = 0; i < input.length(); i++) {
    char letter = input.charAt(i);
}
```

3. At each iteration, print the value of the variable **`letter`**:

```
for (int i = 0; i < input.length(); i++) {
    char letter = input.charAt(i);
    System.out.println(letter);
}
```

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#4

6. Vowels Sum

Write a program that reads **text** (string) entered by the user, calculates, and prints the **sum of the values of the vowels** according to the table below:

letter	a	e	i	o	u
value	1	2	3	4	5

Sample Input and Output

Input	Output	Comments
hello	6	e + o = 2 + 4 = 6
hi	3	i = 3
bamboo	9	a + o + o = 1 + 4 + 4 = 9
beer	4	e + e = 2 + 2 = 4

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#5

7. Sum Numbers

Write a program that reads **n-number integers** entered by the user and sums them.

- On the first line, print the number **n** that you will enter.
- On the next lines, enter the **n numbers** that you will sum.

The program must read the numbers, sum them, and print their sum.

Sample Input and Output

Input	Output
2 10 20	30

Input	Output
3 -10 -20 -30	-60

Input	Output
4 45 -20 7 11	43

Input	Output
1 999	999

Input	Output
0	0

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#6

8. Number sequence

Write a program that reads **n integers**. Print the **largest** and **smallest** numbers from the entered numbers.

Sample Input and Output

Input	Output

Input	Output

5 10 20 304 0 50	Max number: 304 Min number: 0

6 250 5 2 0 100 1000	Max number: 1000 Min number: 0

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#7

9. Left and Right Sum

Write a program that reads **2 * n** numbers of integers submitted by the user and checks if the sum of the **first n numbers** (left sum) is equal to the sum of the **second n numbers** (right sum). In the case of equality, print "**Yes, sum** = " + **the amount**; otherwise print "**No, diff** = " + **the difference**. The difference is calculated as a positive number (use absolute value).

Sample Input and Output

Input	Output	Comments
2 10 90 60 40	Yes, sum = 100	10+90 = 60+40 = 100

Input	Output	Comments
2 90 9 50 50	No, diff = 1	90+9 ≠ 50+50 Difference = |99-100| = 1

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#8

10. Odd Even Sum

Write a program that reads **n-number integers** submitted by the user and checks if the **sum of the numbers of even positions** is equal to the **sum of the numbers of odd positions**.

- If the amounts are equal, print two lines: "**Yes**" and a new line "**Sum = ** " + **the amount**
- If the amounts are not equal, print two lines: "**No**" and a new line "**Diff = ** " + **the difference**
  The difference is calculated as **absolute value**.

Sample Input and Output

Input	Output	Comments
4 10 50 60 20	Yes Sum = 70	10+60 = 50+20 = 70

Input	Output	Comments
4 3 5 1 -2	No Diff = 1	3+1 ≠ 5-2 Diff = |4-3| = 1

Input	Output	Comments
3 5 8 1	No Diff = 2	5+1 ≠ 8 Diff = |6-8| = 2

Testing in the Judge System

Test the solution to this problem here: https://judge.softuni.org/Contests/Compete/Index/3693#9