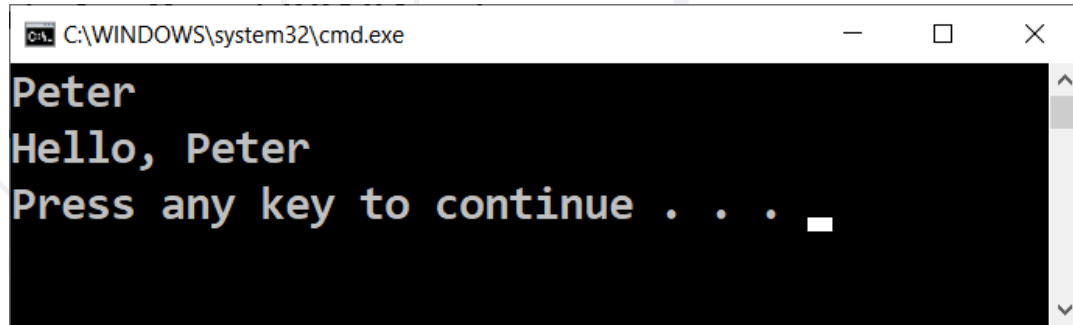# Java Basics Tutorial

Part 3: Console Input / Output

Free Code Lessons

SoftUni

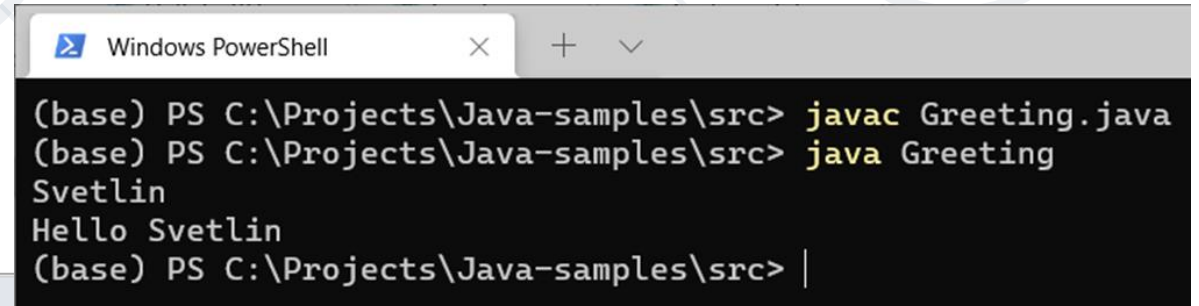# Working with the Console


```
C:\WINDOWS\system32\cmd.exe                    —    □    ×

Peter
Hello, Peter
Press any key to continue . . . _
```

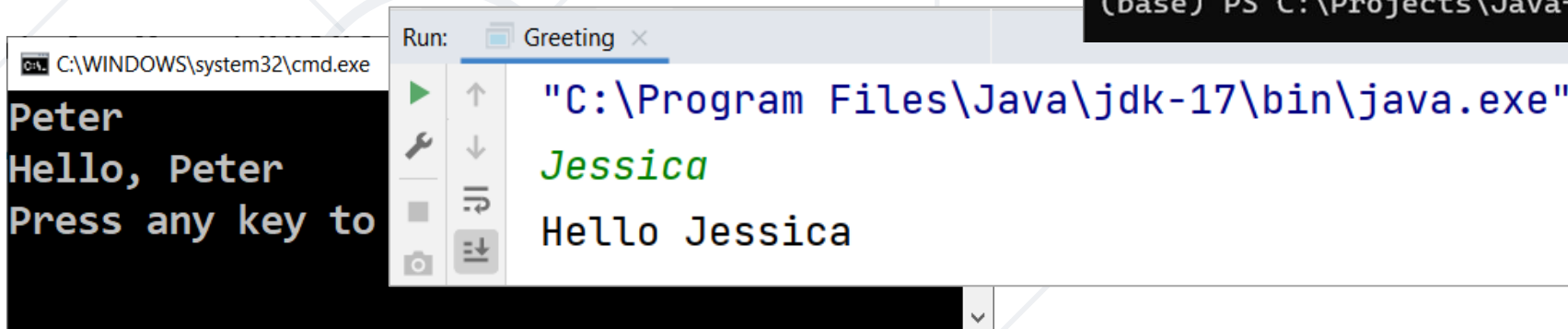# Reading User Input and Formatting Output
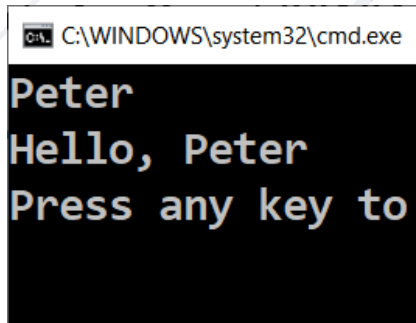
What is the Console (Terminal)?

■ The system **console** / **terminal** / **standard input and output**

■ A **special window**, used to communicate with the user

■ Uses a **text-based** input / output (command line interface)

■ Displays **text** data (text lines)

■ Reads user **input** (text lines)


```
Windows PowerShell                    ×    +    ∨

(base) PS C:\Projects\Java-samples\src> javac Greeting.java
(base) PS C:\Projects\Java-samples\src> java Greeting
Svetlin
Hello Svetlin
(base) PS C:\Projects\Java-samples\src> |
```

```
C:\WINDOWS\system32\cmd.exe

Peter
Hello, Peter
Press any key to
```

```
Run:    Greeting ×

"C:\Program Files\Java\jdk-17\bin\java.exe"

Jessica

Hello Jessica
```

Reading User Input and Printing Strings

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- Everything we **read** from the console comes as a **String**

- Reading user input:

```
Scanner scanner = new Scanner(System.in);
String name = scanner.nextLine();
```

- Everything we **print** to the console is converted to a **String**

```
System.out.println("Hello world!");
```

```
System.out.println("Hello" + 123);
```

Formatting Output

- Formatting text and data using **placeholders**

```java
String firstName = "John";
int age = 19;
System.out.printf("%s is %d years old",
    firstName, age);
// John Doe is 19 years old
```

%s - placeholder for text

%d - placeholder for integer

```java
double a = 5.123;
double b = 6.456;
System.out.printf("%.2f", a + b); // 11.58
```
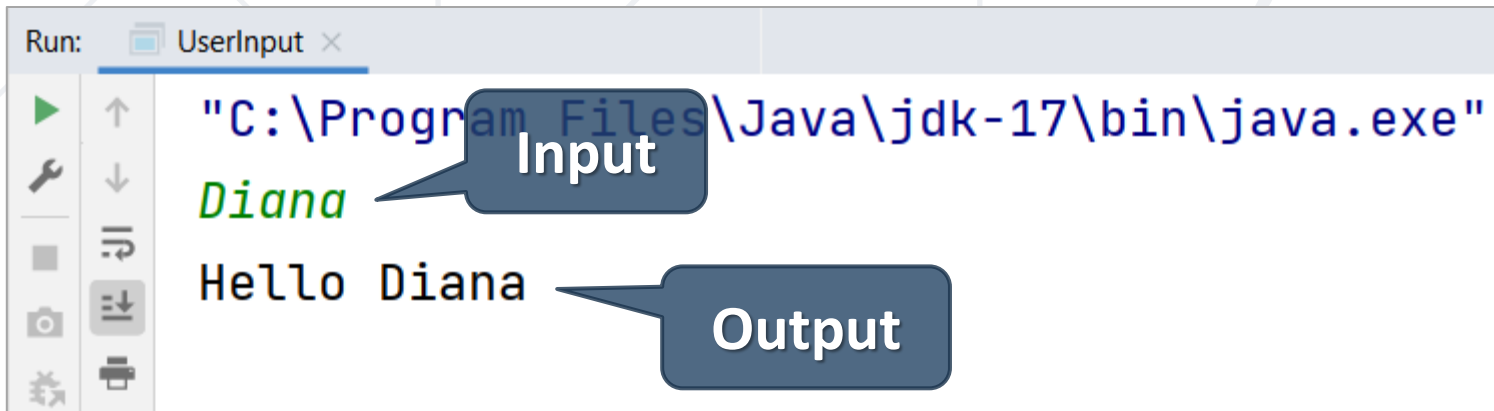
%f - placeholder for floating-point number

2 digits after the decimal point

Reading User Input

- **Read** a name from the console and **prints** a greeting:

```java
Scanner scanner = new Scanner(System.in);
String name = scanner.nextLine();
System.out.println("Hello " + name);
```

- The result from the execution would be:

Reading Numbers

Reading Integers and Floating-Point Numbers

Reading Integers

- Reading an **integer** number from the console in Java:

```
int num = scanner.nextInt();
```

- Example: calculating a square area by given side **a**

```
int a = scanner.nextInt();
int area = a * a;
System.out.println(area);
```

Reading Floating-Point Numbers

- Reading a **floating-point number**:

```java
double num = scanner.nextDouble();
```

- Example: convert **inches** to **centimeters**

```java
double inches = scanner.nextDouble();
double centimeters = inches * 2.54;
System.out.println(centimeters);
```

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Concatenating Text and Numbers

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```java
String firstName = "John";
String lastName = "Doe";
int age = 34;
String result = firstName + " " + lastName + " | " + age;
System.out.println(result); // John Doe | 34
```

Concatenation

```java
int a = 5;
int b = 11;
String result = "a + b = " + a + b;
System.out.println(result); // a + b = 511
```

Coding Exercises

Console-based Input and Output in Java

Learn by Doing

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- To learn coding, you need to **write code**!

- Watching **videos** gives you only **knowledge**

- Solving the **hand-on exercises**, gives you **experience** and practical **skills**

Write and submit the coding exercises!

Problem: Days to Minutes

- Write a program to convert **days to minutes**:
  - Read a single **integer** (the **days** to be converted)
  - Convert the days to minutes (1 day = 24 hours * 60 minutes)
  - Print the **minutes**

| 2 | ➡ | Minutes = 2880 |

| 5 | ➡ | Minutes = 7200 |

Creating a New Project in IntelliJ IDEA

Solution: Days to Minutes
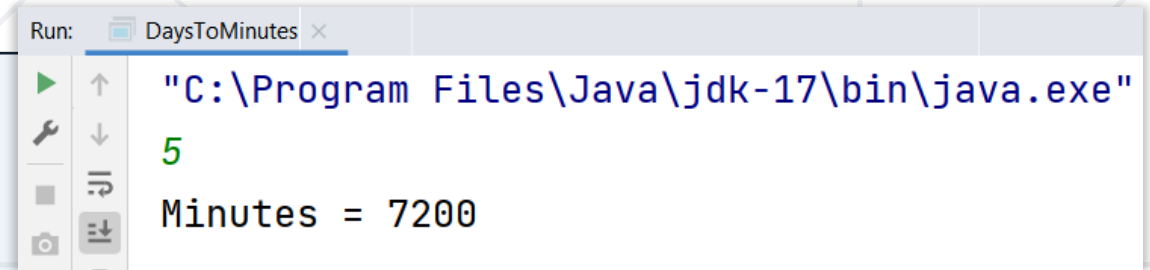
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```java
import java.util.Scanner;
…
Scanner sc = new Scanner(System.in);
int days = sc.nextInt();
int hours = days * 24;
int minutes = hours * 60;
System.out.println(
    "Minutes = " + minutes);
```

Run: DaysToMinutes ×

"C:\Program Files\Java\jdk-17\bin\java.exe"

5

Minutes = 7200

Submission in the Judge System

https://judge.softuni.org/Contests/Practice/Index/3253

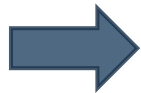# Problem: Centimeters to Inches

- Write a program to **convert centimeters to inches**:

    - Read **a floating-point** number: **centimeters**

    - Convert the centimeters to inches: **divide by 2.54**

    - Print the calculated result in the format below:

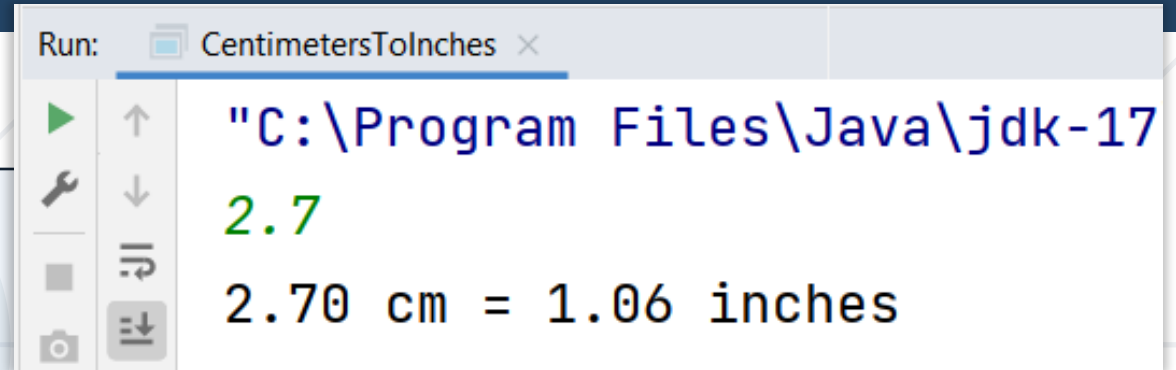| 5	➡	5.00 cm = 1.97 inches
2.7	➡	2.70 cm = 1.06 inches

Solution: Centimeters to Inches

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```java
import java.util.Scanner;
…
Scanner sc = new Scanner(System.in);
double centimeters = sc.nextDouble();
double inches = centimeters / 2.54;
System.out.printf(
    "%.2f cm = %.2f inches",
    centimeters, inches);
```

Run: CentimetersToInches ✕

```
"C:\Program Files\Java\jdk-17
2.7
2.70 cm = 1.06 inches
```

Problem: Calculate Speed

- Write a program to calculate the speed by time and distance:

  - Read **2 floating-point** numbers: **distance** and **time**

  - Calculate the speed needed to travel the specified **distance** for the specified **time**

  - Print the calculated result formatted to 2nd digit

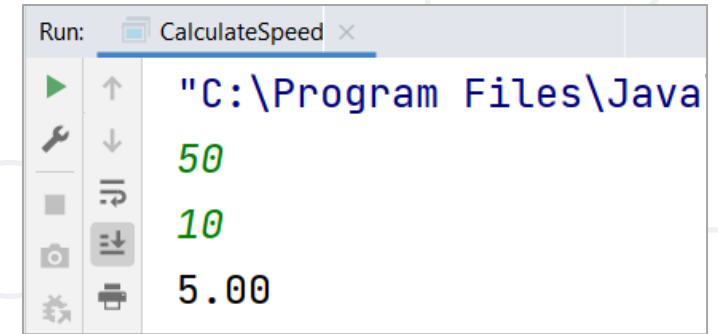| 15 2	→	7.50		15 2.2	→	6.82

Solution: Calculate Speed

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```java
import java.util.Scanner;

…

Scanner sc = new Scanner(System.in);
double distance = sc.nextDouble();
double time = sc.nextDouble();
double speed = distance / time;
System.out.printf("%.2f", speed);
```

Run: CalculateSpeed ✕

```
"C:\Program Files\Java
50
10
5.00
```

Problem: Triangle Area

- Write a program to calculate a **triangle area**:
  - Read from input a side **a** and height for that side **h$_a$**
  - Calculate the **area of a triangle** by its **side** and **height**
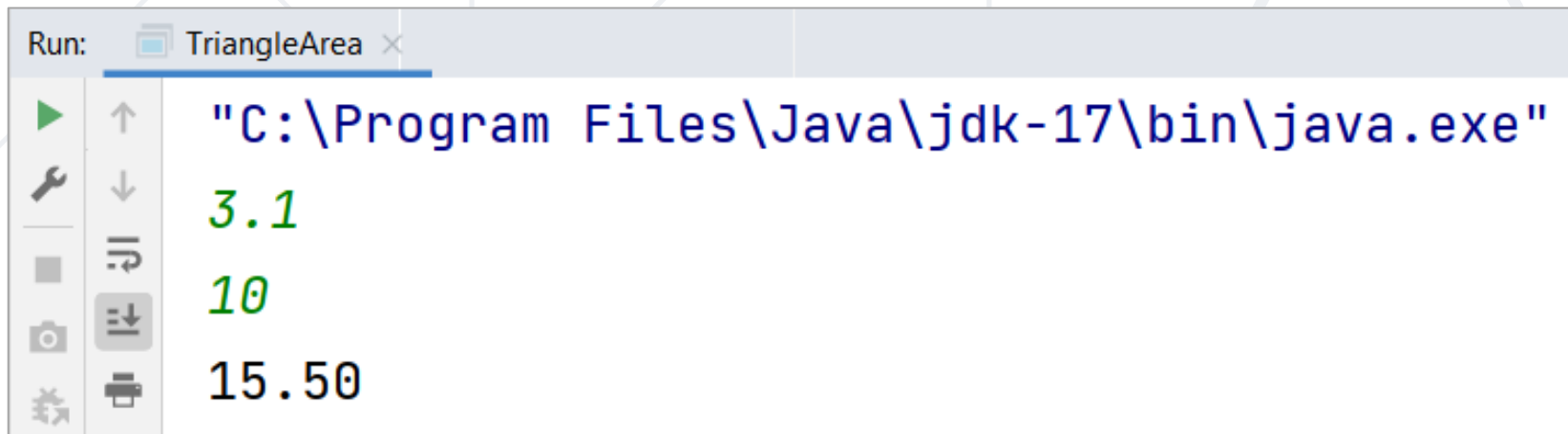 - Print the **area**, formatted to the **2nd digit** after decimal point

| 5 10 | → | 25.00 |

| 3.1 10 | → | 15.50 |

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```java
double a = sc.nextDouble();
double h = sc.nextDouble();
double area = (a * h) / 2.0;
System.out.printf("%.2f", area);
```

```
Run:     TriangleArea ×

    "C:\Program Files\Java\jdk-17\bin\java.exe"

    3.1

    10

    15.50
```

Problem: Circle Area and Perimeter

- Write a program to calculate a **circle area and perimeter**:
  - Read a floating-point number: the **radius of a circle**
  - Calculate the **area** and the **perimeter** of a circle
  - Print the calculated values formatted to the 2nd digit after the decimal point

7 →

```
Area = 153.94
Perimeter = 43.98
```

Learn By Doing!

Now

Do Your Exercises!

Next Steps

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- **Join the SoftUni "Learn To Code" Community**

  ## https://softuni.org

  - **Access the Free Coding Lessons**

  - **Get Help from the Mentors**

  - **Meet the Other Learners**