

Java Basics: IO

**CPSC 233: Introduction to Computer Science for Computer Science
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3 main streams for every program

- `System.in` (like `python sys.stdin`)
 - For typed input in terminal/shell
- `System.out` (like `python sys.stdout`)
 - For terminal/shell output
- `System.err` (like `python sys.stderr`)
 - For terminal/shell output when error happens
 - Generally coloured something different in shell to show this was error output

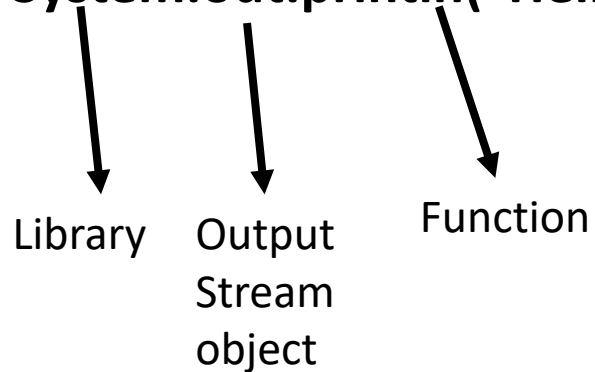


Output (System.out/System.err)



- A built-in function to get an output from the user.
 - Can't use commas to separate multiple outputs
 - (can only concatenate, or use multiple prints)

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



```
System.err.println("Error!");
```

-> Does the same but to error stream

Input (System.in)



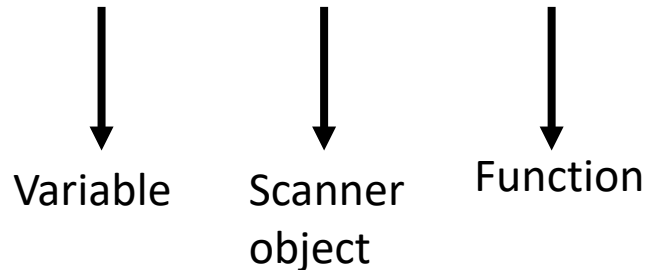
- Much messier in Java than it is in Python
- Current common way (more than one way in Java!)
- <https://docs.oracle.com/en/java/javase/11/docs/api/java.base/java/util/Scanner.html>

```
import java.util.Scanner;
```

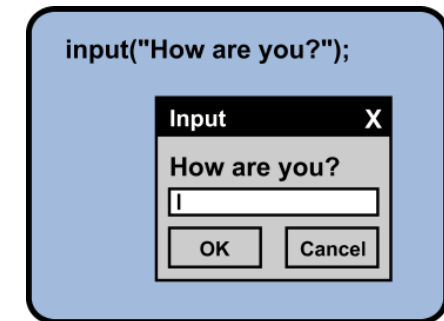
```
Scanner scanner = new Scanner(System.in);
```

```
System.out.print("Please enter your name: ");
```

```
String name = scanner.nextLine();
```



- The obtained value will be stored in the variable in **String** form.
- You need to convert the value type if necessary.



Getting Types of Input

<code>int nextInt()</code>	It is used to scan the next token of the input as an int .
<code>float nextFloat()</code>	It is used to scan the next token of the input as a float .
<code>double nextDouble()</code>	It is used to scan the next token of the input as a double .
<code>byte nextByte()</code>	It is used to scan the next token of the input as a byte .
<code>String nextLine()</code>	It is used to scan the next token of the input into a String .
<code>boolean nextBoolean()</code>	It is used to scan the next token of the input into a boolean .
<code>long nextLong()</code>	It is used to scan the next token of the input as a long .
<code>short nextShort()</code>	It is used to scan the next token of the input as a short .
<code>BigInteger nextBigInteger()</code>	It is used to scan the next token of the input as a BigInteger .
<code>BigDecimal nextBigDecimal()</code>	It is used to scan the next token of the input as a BigDecimal .

Changing Types from a String



<code>Integer.parseInt(input_string)</code>	If you just get a String you can change it into an Integer
<code>Float.parseFloat(input_string)</code>	If you just get a String you can change it into an Float
<code>Double.parseDouble(input_string)</code>	If you just get a String you can change it into an Double
<code>Double.parseBoolean(input_string)</code>	If you just get a String you can change it into an Boolean

Errors



Types of Errors

- Three categories
 1. **Syntax**
 - Compile time to byte-code (**javac** error)
 - (more of these in Java than Python due explicit types)
 2. **Runtime**
 - Known as exceptions (**java** error)
 - (fewer of these due to Java explicit types)
 3. **Logic (Semantic)**
 - Mistakes in program (program never crashes)
 - (likely fewer of these due to Java explicit types)

Onward to ... Writing a Java Program.

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