Introducing Java

CSC207 Winter 2018
What does it mean to run a program?

What is a program?

A set of instructions for a computer to follow.

To run a program, it must be translated from a high-level programming language to a low-level machine language whose instructions can be executed.

Roughly, two flavours of translation:

- Interpretation
- Compilation
Interpreted vs. Compiled

- Interpreted (like Python)
  - Translate and execute one statement at a time
- Compiled (like C)
  - Compile the entire program (once), then execute (any number of times)
- Hybrid (like Java)
  - Compile to something intermediate (in Java, bytecode)
  - The Java Virtual Machine (JVM) runs this intermediate code
Compiling Java

If using command line, you need to do this manually.

First, compile using “javac”:

```bash
jsin@laptop$ javac HelloWorld.java
```

This produces file “HelloWorld.class”:

```bash
jsin@laptop$ ls
```

```
HelloWorld.class  HelloWorld.java
```

Now, run the program using “java”:

```bash
jsin@laptop$ java HelloWorld
```

Hello world!

Most modern IDEs offer to do this for you (IntelliJ does).

But you should know what’s happening under the hood!
Java Naming Conventions

- The Java Language Specification recommends these conventions
  - Generally: Use camelCase not pothole_case.
  - **Class name**: A noun phrase starting with a capital.
  - **Method() name**: A verb phrase starting with lower case.
  - **Instance variable**: A noun phrase starting with lower case.
  - **Local variable or parameter**: ditto, but acronyms and abbreviations are more okay.
  - **Constant**: all uppercase, pothole_case.
    - E.g.: MAX_ENROLMENT
JavaDoc

• External Documentation (JavaDocs) vs. Internal Documentation (Comments)

• Like a Python docstring, but more structured, and placed above the method, classes, and variables.

```java
/**
 * This method takes x and y, does something with it, and
 * returns the sum.
 *
 * @param x The double to add
 * @param y The integer to add
 *
 * @return The sum of x and y
 *
 * @throws PiException If pi is not 22/7 today.
 * @see Integer
 */

public void sums_of_nums(double x, int y) { ... }
```

• This is where the Java API documentation comes from!

• In IntelliJ: Tools → Generate JavaDoc