Java Programs include:

- class name: every program has at least one “public” class. Must be same name as file. Convention is to use upper case for classes.

- class must contain a `main` method. Program execution begins in `main`.

- every java statement ends with a semicolon “;”

- reserved words or keywords have special meaning to compiler and can’t be used for other things (i.e. can’t be variable names)

- braces (open and close curlies “{ }”) form a block of code

- blocks are indented for readability

- comments denotes by “//” or “/* ... */”

- string denoted by “...”, as in “This is a character string”
Good Java style includes:

• camel case for compound words: e.g. *HelloWorld*, or *interestRate*

• use blank lines liberally to make code easier to read, and to separate different sections of code

• appropriate comments: a summary at beginning of program to explain what program does, overall data structures,

• meaningful variable names: e.g. *countTries*, not *i*

and speaking of variables ...
Java variables:

• java is a ‘typed’ language (python isn’t)
  • variables must be declared to be a certain type before being used
  • not allowed to switch type later in program

• final - makes the variable constant (traditional use CAPS to indicate)

```python
final double PI = 3.14159;
final int NUM_CHANCES = 10;
```
Java variables:

• (primitives) types include:
  • numeric types:
    byte, short, int, long, float, double
    (4.2 is double, not float; 4.2f is float but stick to double)
  • boolean
  • char (Unicode rep., 16 bits)

• Strings, Objects are NOT primitive types (will discuss later)
Java operators:

• Standard operators: +, -, *, /
  Note: integer divide : what is $2/5$? How get 0.4?

• Mod operator: %
  Note: what is $25 \% 3$? How tell even/odd?

• Exponentiation: no operator. Use $\text{Math.pow}(2, 3)$ for $2^3$
  $\text{Math.pow}(16, 0.5)$ for $\sqrt{16}$

• Augmented assignment operators: += -= *= /=
  $i += 2$ means $i = i + 2$

• Increment/Decrement operators: ++ or -- (pre or post)
  $i ++$ means use $i$ then increment it
  $- - i$ means decrement $i$ then use it