Introductory Java 4

Arrays, Operators, Expressions
Statements, Blocks, Random
Java Arrays

- Arrays hold a fixed number of values of a given type (or sub-type) that can be accessed by an index

- Declaring:
  \[
  \text{int[]} \ \text{values};
  \]

- Initializing:
  \[
  \text{values = new int}[8]; \ // \ 8 \ \text{element array}
  \]

- Accessing:
  \[
  \text{int} \ \text{x} = \text{values}[3]; \ // \ \text{the 4}\text{th element}
  \]

- Copying:
  \[
  \text{System.arraycopy(x, 0, y, 0, 8);}
  \]
Java Operators

- Assignment
  
- Arithmetic
  \[ + \ - \ * \ / \ % \]

- Unary
  \[ + \ - \ ++ \ -- \ ! \]

- Equality, relational, conditional and `instanceof`
  
- Bitwise
  
\[ \sim \ & \ ^ \ | \ \ll \ \gg \ \ggg \]
Expressions

• A construct that evaluates to a **single value**.
• Made up of
  – variables
  – operators
  – method invocations
• Compound expressions follow precedence rules
  – Use parentheses (clarity, disambiguation)
Statements

• A complete unit of execution.
• **Expression** statements (expressions made into statements by terminating with ‘;’):
  – Assignment expressions
  – Use of ++ or --
  – Method invocations
  – Object creation expressions
• **Declaration** statements
• **Control flow** statements
Blocks

- Zero or more statements between balanced braces (‘{’ and ‘}’)
- Can be used anywhere a single statement can
The Random Class

The Random class provides a pseudo-random number generator:

```java
Random rand = new Random();
```

You can optionally provide a seed (for determinism):

```java
Random rand = new Random(12345);
```

You can then generate random numbers of different types:

```java
int i = rand.nextInt(10); // number in 0-9
```