Introductory Java 4

J4

Arrays, Operators, Expressions

Statements, Blocks, Random

Java Arrays

- Arrays hold a fixed number of values of a given type (or sub-type)
- Declaring

  ```java
  int[] values;
  ```

- Initializing

  ```java
  values = new int[8]; // 8 element array
  ```

- Accessing

  ```java
  int x = values[3];    // the 4th element
  ```

- Copying

  ```java
  System.arraycopy(x, 0, y, 0, 8);
  ```

Java Operators

- Assignment

  `=`

- Arithmetic

  `+ - * / %`

- Unary

  `+ - ++ -- !`

- Equality, relational, conditional and **`instanceof`**

  `== != > >= < <= && ||` **`instanceof`**

- Bitwise

  `~ & ^ | << >> >>>`

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:

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

You can optionally provide a seed (for determinism):

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

You can then generate random numbers of different types:

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