

The background of the slide is a painting of a landscape. In the foreground, there is a field of yellow flowers, possibly rapeseed, with some blue flowers in the lower left. In the middle ground, there are several large, leafy trees. In the background, a village with several buildings, including a church with a tower, is visible on a hillside. The sky is a pale, overcast blue.

J03 Introductory Java 3

Naming
Types
Literals

Java Naming

- Java names:
 - Alphanumeric characters and underscores, must not start with a digit.
 - Keywords and reserved words cannot be used.
 - Case-sensitive.
- Capitalisation conventions
 - Class names start with capital letters (`Bi`ke)
 - Variable/field and method names start with lower case, and use upper case for subsequent words (`cur`rentGear)
 - Constant names use all caps and underscores (`MAX_GEAR_RATIO`)

Java Packages

Every name used in a program must be unambiguous.

A namespace is a part of the code within which names are unique

In Java, a **package** (among other things) defines a namespace.

For example,

```
comp1110.snake.Tile
```

```
comp1110.ass1.Tile
```

Mary Who?



Java Variables

- **Instance** (non-static fields, object-local)
 - Each object has its own version (instance) of the field
- **Class** (static fields, global)
 - Exactly one version of the field exists
- **Local**
 - Temporary state, limited to execution scope of code
- **Parameters**
 - Variables local to a method, given values by method's caller

Java's Primitive Data Types

In addition to objects, Java has 8 built-in 'primitive' data types.

type	Description	Range	Default
byte	8-bit signed 2's complement integer	-128 - 127	0
short	16-bit signed 2's complement integer	-32768 - 32767	0
int	32-bit signed 2's complement integer	$-2^{31} - 2^{31}-1$	0
long	64-bit signed 2's complement integer	$-2^{63} - 2^{63}-1$	0L
float	single precision 32-bit IEEE 754 floating point number		0.0f
double	double precision 64-bit IEEE 754 floating point number		0.0d
boolean	logically just a single bit: true or false	true, false	false
char	16-bit Unicode character	0 - 65535	0

Java Literals

- Integer literals (e.g., 1) default to type `int`.
 - An integer value is a `long` if it ends with 'l' or 'L'
 - The prefix 0x indicates hexadecimal, 0b is binary, 0 octal:
 - `0x30` // 48 expressed in hex
 - `0b110000` // 48 expressed in binary
 - `060` // 48 expressed in octal
 - Underscores can be used to break up numbers:
 - `long creditCardNumber = 1234_5678_9012_3456L;`
- A decimal value ending in 'f' is a `float`, while 'd' indicates `double` (default).
- Text in "double quotes" is a `String`.
- A single character in single quotes (e.g., 'A') is a `char`.

Java Arrays

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

- Declaring:

```
int[] values;
```

- Initializing:

```
values = new int[8]; // 8 element array, all zeros
```

```
values = new int[]{1, 2, 3, 4}; // with specific values
```

- Accessing:

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

- Copying:

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