
Australian
National
University
Introductory Java 3
J3
Naming
Literals
Primitives
Structured Programming 1110/1140/6710

Java Modules

- A module is a named group of packages and related resources
- Strong encapsulation
- Explicit dependencies

```
module java.sql {
 requires transitive java.logging;
 requires transitive java.transaction.xa;
 requires transitive java.xml;

 exports java.sql;
 exports javax.sql;

 uses java.sql.Driver;
}
```

Java Packages

Which Mary?

Mary Queen of Scots

‘Queen of Scots’ provides a namespace within which ‘Mary’ is well defined. In Java a **package** provides a namespace.

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
  - Temporary state, limited to execution scope, passed from one method to another

Java Naming

- Java names are case-sensitive
  - Whitespace not permitted
  - $, _ to be avoided
  - Java keywords and reserved words cannot be used
- Capitalization conventions
  - Class names start with capital letters (`Bike`)
  - Variable names start with lower case, and use upper case for subsequent words (`currentGear`)
  - Constant names use all caps and underscores (`MAX_GEAR_RATIO`)

Java's Primitive Data Types

In addition to *objects*, Java has 8 special, 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

- When a numerical value (e.g. ‘1’) appears, the compiler normally knows exactly what it means.
- Special cases:
  - An integer value is a `long` if it ends with ‘l’ or ‘L’
  - The prefix `0x` indicates hexadecimal, `0b` is binary:
    - `0x30 // 48 expressed in hex`
    - `0b110000 // 48 expressed in binary`
  - An ‘f’ indicates a `float`, while ‘d’ indicates `double`.
  - Underscores may be used to break up numbers:
    - `long creditCardNumber = 1234_5678_9012_3456L;`