Readability of Code

- reader should be easily able to correctly interpret what the code does
- code should be economical, but not to the point where this compromises intelligibility
- you have control over naming and over coding style
  - also naming conventions
  - also programming idioms (solutions typical/common to the language)

Programming Style

- programming style is not about self-expression
- programming style is about reducing errors
  - a program must communicate to the computer and to the reader

Use a familiar style unless there's a benefit in departing from it.

Code Style and IDEs

- most allow you to apply a predefined code style to your project

Code Checking Tools

- e.g. lint
- statically identify problems with the code (without executing it)

General Principles

- Make your programs look like what they do.
- Avoid forms that are difficult to distinguish from common errors.
- If there is a feature of a language that is sometimes problematic, and if it can be replaced with another feature that is more reliable, then always use the more reliable feature.

Java Code Conventions

Why?

- 80% of the lifetime cost of a piece of software goes to maintenance
- hardly any software is maintained for its whole life by the original author
- code conventions improve the readability of the software, allowing engineers to understand new code more quickly and thoroughly
- If you ship your code as a product, you need to make sure it is as well packaged and clean as any other product

Naming

- make programs more understandable & easier to read
- can give info about the function of the identifier (e.g. whether it's a constant or a class)

Order of Keywords

- using a conventional order makes code easier to read
- Java has a recommended order (e.g. `public static final`)

Issues with Languages

[...]

- Effect Systems
  - http://www.eff-lang.org/handlers-tutorial.pdf
- Extended Static Type Checking
- Meta-theory
  - Most programming languages have no formalisation of their semantics
- Cost Models
  - The complexity bound is calculated on the resources consumed by performing a computation, letting a programmer check the cost of a program: http://www.raml.co

- Parallelism
  - Languages providing abstract forms of control flow and data batching/locality, into which a program can cast itself, to permit exploitation of heterogeneous computers
  - Usually hidden in the compilation process
- Parametric Mutability