Programming in the Small:
C/C++/Java Pitfalls & Ada Benefits

Ada Core
TECHNOLOGIES.INC

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Suggested Reading

- *C Traps and Pitfalls*
  - by Andrew Koenig (Addison Wesley)

- *Guidelines for the Use of the C Language in Vehicle Based Software*
  - Purchasing info at http://www.misra.org.uk/misra-c.htm

- *Multilanguage Programming on the JVM: The Ada 95 Benefits*
  - http://libre.act-europe.fr/Why_Ada/ada-on-jvm.pdf

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Other Relevant Material

- Links
  - http://www.elj.com/cppcv3/
    - A critique of C++
  - http://www.cs.mdx.ac.uk/harold/srf/javaspae.html
    - A critique of Java
  - http://www.jaegers.net/humor/stroustrup.php
    - Stroustrup's interview leaked :)
  - http://www.web-hits.org/txt/codingunmaintainable.html
    - How to write unmaintainable code

- Books
  - *Effective C++*, by Scott Myers (Addison Wesley)
  - *Java Pitfalls*, by Michael C. Daconta et al., (Wiley)
  - *Objects Unencapsulated: Java, Eiffel, and C++*, by Ian Joyner (Prentice Hall)

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Important Note

- **All C/C++/Java code examples showed in this lecture compile**
  - Some are correct according to the C/C++/Java semantics
  - Others are specified to be errors in the standards but …
  - … an implementation is not required to detect them

- **They contain coding errors undetected by most C/C++/Java compilers**

- **Most of the pitfalls shown in this lecture are written in C/C++**
  - They can easily be converted to Java

- **Some pitfalls only occur in C/C++ and not in Java**
  - When this is the case it will be pointed out in the example

- **This lecture is not an exhaustive list of C/C++/Java pitfalls**
  - There are more

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Note on the Ada Compiler

- **In this course we use GNAT**
  - GNAT is the GNU Ada 95 compiler

- **GNAT is widely available**
  - You can download the sources of GNAT
  - Pre-built GNAT binaries available for: Linux, Solaris, Windows

- **Available at**
  - `http://libre.act-europe.fr/GNAT/`

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