

Programming in Real Bioinformatics

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Outline

- 1 Five Programming Languages?
- 2 Software Development Process
- 3 Waterflow
- 4 Agile Software Development
- 5 Conclusion
- 6 Final Examination

Next

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Why do we need five programming languages?

Why do we have to learn languages?

- 廣東話
- 普通话
- 客家话
- 上海话
- English
 - England, Scotland, Wales, North Ireland
 - United States
 - Hong Kong
- Hinglish
- ...

Programming Languages

- C: Embedded device, high performance system software
- C++: Embedded device, large-scale software, GUI applications
- Java: Large-scale system, Enterprise systems, cross-platform applications
- Perl: Text processing, biological sequence processing, CGI-programming
- Python: System administration, desktop applications, web development
- R: Data analysis and visualization
- Objective-C: applications on iOS and Mac OS
- Swift: a future programming languages for Apple products
- Go: Google's system programming languages
- Ruby, Scala, Julia, JavaScript, LaTeX ...

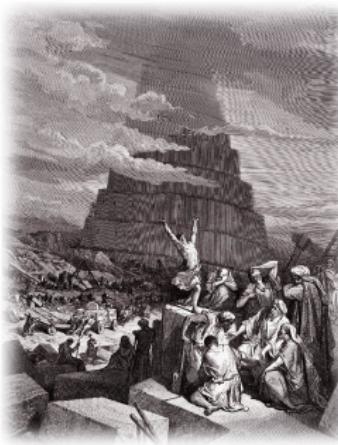
The
Pragmatic
Programmers

Seven Languages in Seven Weeks

A Pragmatic
Guide to
Learning
Programming
Languages

Bruce A. Tate

Edited by Jacquelyn Carter



香港中文大學

The Chinese University of Hong Kong

Seven More Languages in Seven Weeks

Languages That Are
Shaping the Future



Bruce A. Tate, Fred Daoud,
Ian Dees, and Jack Moffitt

Foreword by José Valim

Edited by Jacquelyn Carter



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Seven Databases in Seven Weeks

A Guide to Modern Databases
and the NoSQL Movement



Eric Redmond
and Jim R. Wilson

Series editor: Bruce A. Tate
Development editor: Jacquelyn Carter



Seven Concurrency Models in Seven Weeks

When Threads Unravel



Paul Butcher

Series editor: Bruce A. Tate
Development editor: Jacquelyn Carter



Seven Web Frameworks in Seven Weeks

Adventures in Better Web Apps



Jack Moffitt
and Fred Daoud

Series editor: Bruce A. Tate
Development editor: Jacquelyn Carter

Interaction between Programming Languages

- C-based: C, C++, Go, R, Perl, Python ...
- Virtual Machine based:
 - JVM: Java, Scala, JPython, Perl 6 ...
 - CLI: C++/CLI, C#, IronPython, F#, VB.NET, PowerShell ...
- Interface: web service, file, database, container ...

- Java and R: rJava
- Perl and R: RSPerl
- Python and R: rpy2
- C/C++ and R: rcpp
- C and Perl: perl.h
- Java and C/C++: JNI

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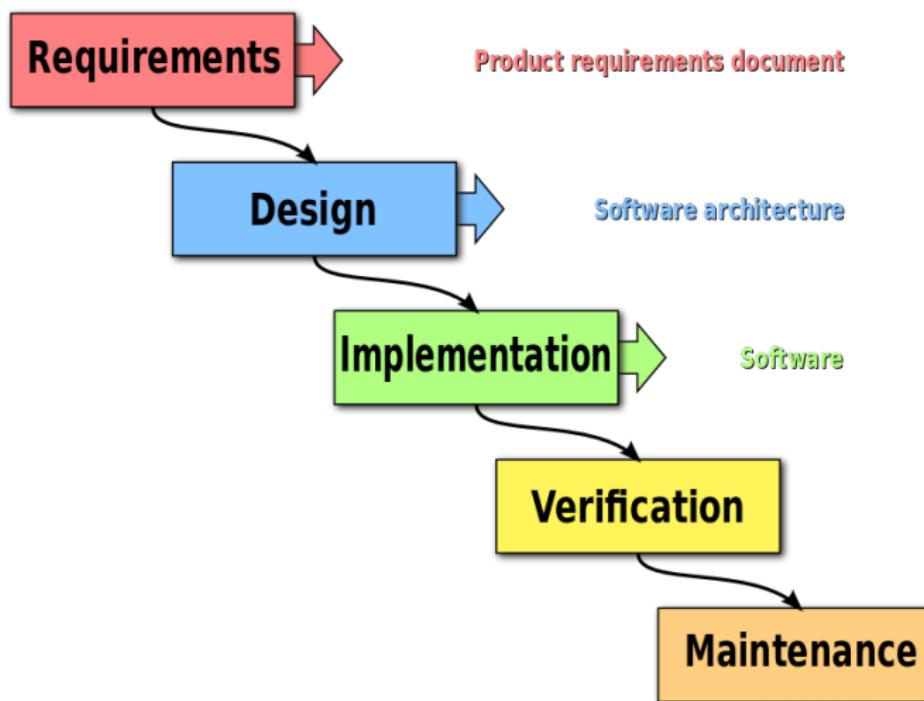
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Waterflow



Case: Fibonacci Sequence Generator

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Scope

Question Sample

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Tips