



Chapter 0 Introduction



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Content

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- Bloating of complexity
- Java and C++
- About this course
 - Course Arrangement
 - Materials
 - How to learn
 - Self-teaching
- Course design



Bloating of Complexity

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- Bloating
- Complexity
 - Complexity of problems and data
 - Complexity of programs
 - ✦ More complex logical fundament
 - ✦ More abstract model
 - ✦ Easier grammar



Evolution

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- Evolution of program language

- Machine、 Assembly
- Procedure oriented
- Object oriented / Aspect oriented



Increase of
capsulation

- Evolution of capsulation

- Class library
- Design pattern
- Framework
- Service



Dilemma

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- Dilemma in programming
 - Increasing user need (Security, Transaction...)
 - Increasing size of software modules
 - Decreasing efficiency of software development
 - Increasing cost of maintenance
- The goal of Java since its birth
 - Using precise, easy-to-read, secured program for problem solving
 - Thinking in Java



Java and C++

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- The pointer
- String
- DLL
- Portability
- Multiple inheritance
- Garbage Collection



Java and C++ - Problems in C++

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- The pointer

```
// Move and inverse memory
int i;
for(i=0;i<=size;i++){
    to_block[size-i] = from_block[i]; // Can you see the bug?
}
```




Java and C++ - Problems in C++

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- String

```
char str [] = "Hello"; //C-style
```

...

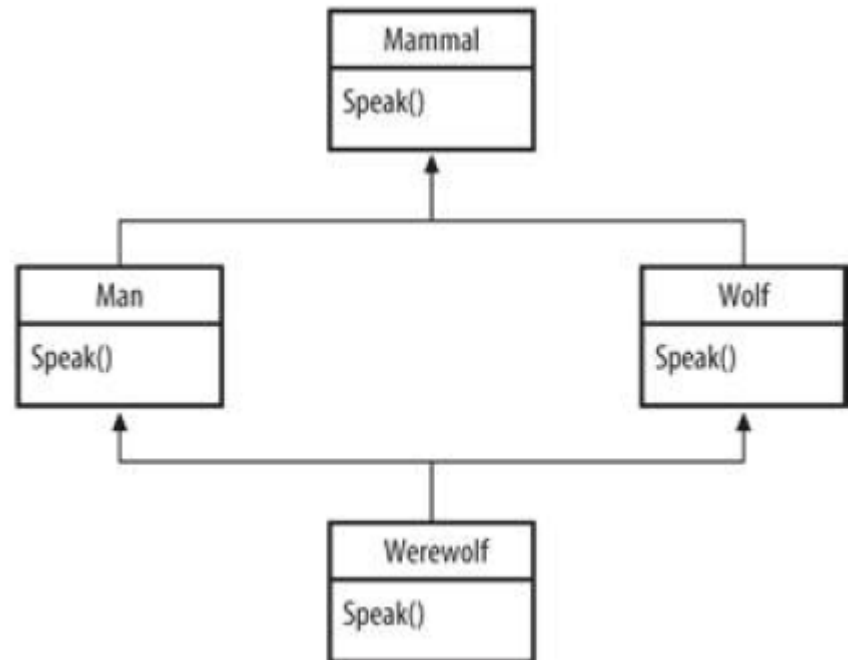
```
String str = "Hello, I'm feeling a little better."; //ANSI C++ from 1997
```



Java and C++ - Problems in C++

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- DLL version compatibility
- Portability
- Multiple inheritance





Java and C++ - Problems in C++

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- Garbage Collection

```
System.gc();
```





Java and C++ - Java Solution

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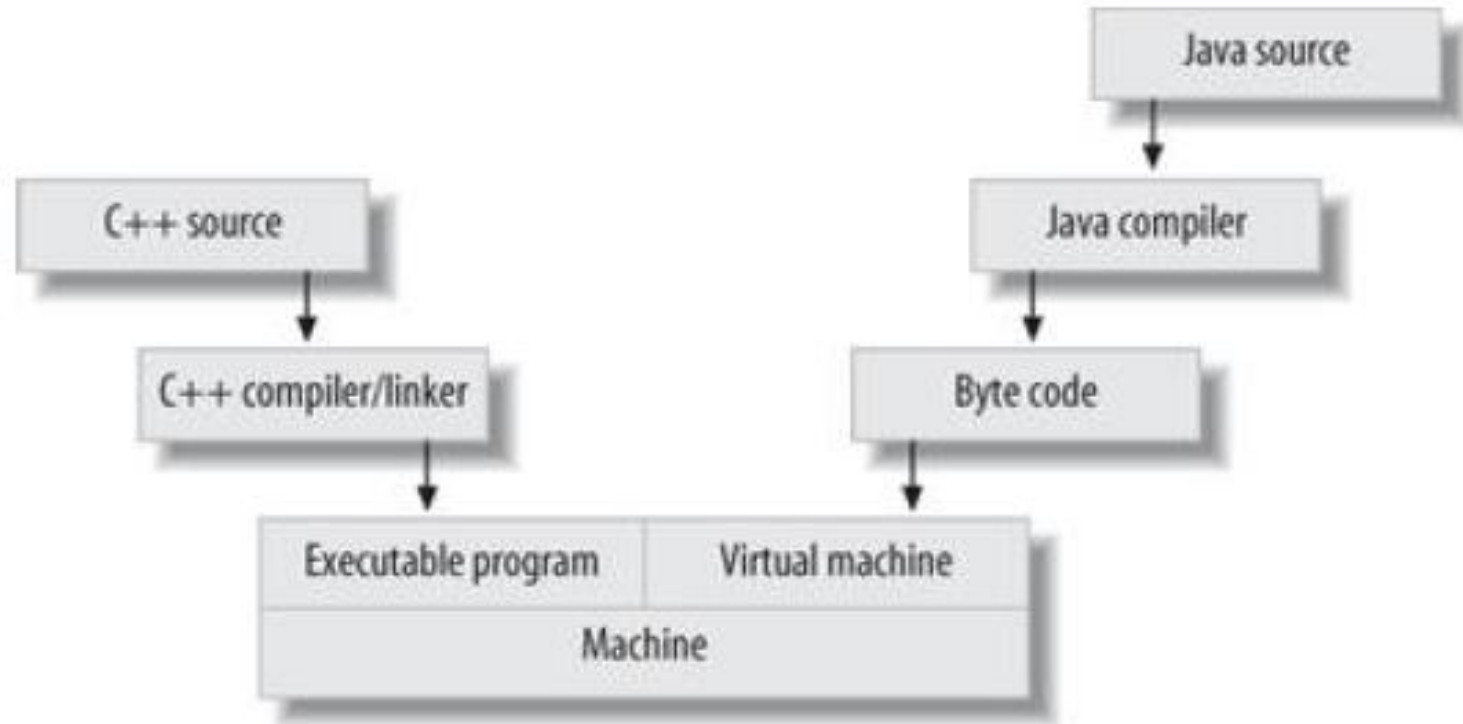
- JVM portability: Write Once, Run Anywhere
- Byte code specification: specified JVM and Java language
- Limited memory access by JVM: sandbox
- Meta-model : Reflective Programming
- Automatic garbage collection
- Pointer removed



Java and C++ - Java Solution

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- *What is the pros and cons of Java?*



Week	Content	Category
W1	Introduction, Java Fundamentals	Fundamental
W2	Java OOP I (Classes and Objects)	
W3	Java OOP II (Abstract, Inheritance, Polymorphism)	
W4	Java OOP II (Abstract, Inheritance, Polymorphism)	
W5	Java Exception	
W6	Java I/O	
W7	Java Collection; Java Generic Type	
W8	Java and UI;	Advanced
W9	Java Multithread; Java and Markup; Grouping; DP Assignment	
W10	JDBC	
W11	Java Network Programming	
W12	Design Pattern 1,2,3; Final Project Assignment	Design pattern
W13	Design Pattern 4,5,6	
W14	Design Pattern 7,8,9	
W15	Final Project; Q&A	

Week	Classroom	
W1	J2-305 (Mon. 8-9)	COSE268 (Wed.3-5)
W2	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W3	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W4	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W5	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W6	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W7	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W8	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W9	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W10	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W11	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W12	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W13	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W14	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)
W15	COSE268(Mon. 8-9)	COSE268 (Wed.3-5)



Materials

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- The best textbook is Javadoc !!!
- Textbook:
 - Java Programming Language 4ed
- Readings:
 - Thinking in Java
 - Head first Java
 - Better, Faster and Lighter Java (轻快的好Java)
 - Beyond Java
 - Inside Java Virtual Machine...





Related Areas

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- Data formats: HTML, XML
- Java platform: J2ME, J2EE
- WWW Architecture / SOA



How to Learn

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- How to study Java in a AGILE way?
 - TYPE the examples in the textbook
 - Learn to use Javadoc
 - Don' t focus on the grammar details
 - Fully use of open-source community
 - ✦ Sun Developer Network
 - ✦ Sourceforge
 - Other resources:
 - ✦ www.java2s.com : code examples, tutorials



Self-teaching

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- The installation of JDK
- Setup of Classpath
- *Use of Ant



Forecast

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- Evolution of Java
- JDK and JRE
- Java Operating Mechanism
- Java Developing Environment
- Java Primary Data Types
- Java Basic Grammar