

JAVA程序设计

潘微科

教师信息

- 潘微科
- Office: 沧海校区致腾楼(计算机与软件学院) 724室
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- Office hour: 周三下午14:00-16:00
- 更多信息: <http://csse.szu.edu.cn/staff/panwk/>



课程信息

- 基本信息：
 - 课程号：150003004**[01]**
 - 课程名称：Java程序设计
 - 课程类别：学科专业选修
 - 学分：3学分（理科学分）
 - 学时：72学时（36课堂+36实验）
 - 主选班级：**2023计算机科学与技术国际班、2023计算机科学与技术数计班**
 - 课堂：每周五**第7-8节14:15-15:40**，致理楼**L1-409**教室
 - 实验：每周五**第9-10节16:00-17:25**，致腾楼**322**实验室
- QQ群：“Java程序设计(2024Fall)” 281582213
- 助教：**李杨**
- 先修课程：《程序设计基础》或《面向对象程序设计》
- 开发环境：JDK, Eclipse/IDEA等



教材(1/5)



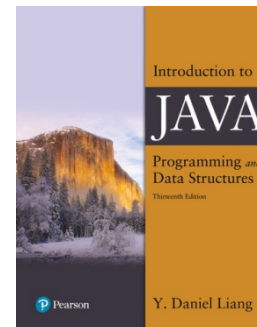
- UOOC联盟指定参考书（深圳大学教材出版基金资助）：
 - 张席. 《Java语言程序设计教程》.西安电子科技大学出版社, 2015.8.

教材 (2/5)



- 教材：
 - 耿祥义. 《Java大学实用教程》（第4版）. 电子工业出版社, 2017.3.
 - 张跃平, 耿祥义, 雷金娥. 《Java大学实用教程学习指导》（第3版）. 电子工业出版社, 2012.8.

教材 (3/5)

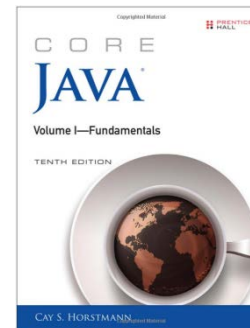


- 参考教材：
 - Y. Daniel Liang, Margaret L. Lial. [Introduction to Java Programming and Data Structures](#), Comprehensive Version (**13th Edition**). Pearson, 2023.5. 注: 该书第12版有中译本
Prof. Y. Daniel Liang <https://yongdanielliang.github.io/>

英文影印版:

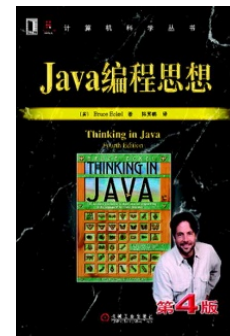
- Y. Daniel Liang. [Java语言程序设计: 基础篇](#) (英文版 **第11版**). 机械工业出版社, 2020.6.
- Y. Daniel Liang. [Java语言程序设计与数据结构: 进阶篇](#) (英文版 **第11版**). 机械工业出版社, 2020.6.

教材 (4/5)



- 其他教材：
 - Cay S. Horstmann. **Core Java Volume I--Fundamentals** (10th Edition). Prentice Hall. 2016.1. (人民邮电出版社2016.6出版了英文影印版)
 - Cay S. Horstmann. **Core Java, Volume II--Advanced Features** (10th Edition). Prentice Hall. 2016.12. (人民邮电出版社2017.6出版了英文影印版)
 - 官方主页: <https://horstmann.com/corejava/index.html>
 - 注: 英文最新是第13版, 影印版尚未引进, 中译版 (**Java核心技术, 第12版**) 已经出版.

教材 (5/5)



- 其他教材：
 - Bruce Eckel. **Thinking in Java** (4th Edition). Prentice Hall, 2006.2. 注：机械工业出版社 2007.4 出版了影印版, 2007.6 出版了中译本（陈昊鹏 译）。

几个基本问题

- **WHY:** 我为什么要学“Java程序设计”？
 - 在工业界和学术界的重要性不言而喻，是最受欢迎的语言之一
- **WHAT:** 我能从“Java程序设计”课程学到什么？
 - Java编程的基础知识
- **HOW:** 我如何能学好“Java程序设计”？
 - 教材：课堂教学
 - 实验：实际开发
 - 多查阅网上的资料，**多动手**（JDK, Eclipse/IDEA）

一个更有挑战性的问题

- **WHY:** 网上有那么多公开课/在线视频，我为什么还要到课堂来学？
 - 学堂在线 <http://www.xuetangx.com/>
 - 中国大学MOOC <https://www.icourse163.org/>
 - <https://www.coursera.org/>
 - <https://www.edx.org/>
 - <https://www.udacity.com/>
- 如果时间允许，多渠道学习（互补性），有选择有目的（不要为了学习而学习）

线下课堂安排

- 与MOOC视频（优课联盟）的对应关系
 - Ch1: Java语言概述[MOOC-Ch1]
 - Ch2: 基本数据类型和数组[MOOC-Ch2]
 - Ch3: 运算符、表达式和语句[MOOC-Ch2]
 - Ch6: 字符串和正则表达式[MOOC-Ch5]
 - Ch4: 类和对象[MOOC-Ch3]
 - Ch5: 继承、接口和泛型[MOOC-Ch4, 6, 7]
 - Ch7: 常用实用类[MOOC-Ch6]
 - Ch8: 线程[MOOC-Ch10]
 - Ch9: 输入流和输出流[MOOC-Ch8]
 - Ch10: 图形用户界面设计[MOOC-Ch9]
 - Ch11: Java中的网络编程[MOOC-Ch11]

线下课堂安排

- 与“Introduction to Java Programming (IJP, 10th Edition)”的对应关系
 - Ch1: Java语言概述[IJP-Ch1-8]
 - Ch2: 基本数据类型和数组[IJP-Ch1-8]
 - Ch3: 运算符、表达式和语句[IJP-Ch1-8]
 - Ch6: 字符串和正则表达式[IJP-Ch1-8]
 - Ch4: 类和对象[IJP-Ch9-11, 19]
 - Ch5: 继承、接口和泛型[IJP-Ch9-11, 19]
 - Ch7: 常用实用类[IJP-Ch20-21]
 - Ch8: 线程[IJP-Ch30]
 - Ch9: 输入流和输出流[IJP-Ch12, 17]
 - Ch10: 图形用户界面设计[IJP-Ch14-16]
 - Ch11: Java中的网络编程[IJP-Ch31]

”Introduction to Java Programming (IJP): 10th/11th/12th Edition”

- Table of Contents (1/5)
 - Ch1 Introduction to Computers, Programs, and Java
 - Ch2 Elementary Programming
 - Ch3 Selections
 - Ch4 Mathematical Functions, Characters, and Strings
 - Ch5 Loops
 - Ch6 Methods
 - Ch7 Single-Dimensional Arrays
 - Ch8 Multidimensional Arrays

”Introduction to Java Programming (IJP): 10th/11th/12th Edition”

- Table of Contents (2/5)
 - Ch9 Objects and Classes
 - Ch10 Object-Oriented Thinking
 - Ch11 Inheritance and Polymorphism
 - Ch12 Exception Handling and Text I/O
 - Ch13 Abstract Classes and Interfaces
 - Ch14 JavaFX Basics (不要求)
 - Ch15 Event-Driven Programming and Animations
 - Ch16 JavaFX UI Controls and Multimedia (不要求)
 - Ch17 Binary I/O
 - Ch18 Recursion (不要求)

”Introduction to Java Programming (IJP): 10th/11th/12th Edition”

- Table of Contents (3/5)
 - Ch19 Generics
 - Ch20 Lists, Stacks, Queues, and Priority Queues
 - Ch21 Sets and Maps
 - Ch22 Developing Efficient Algorithms (不要求)
 - Ch23 Sorting (不要求)
 - Ch24 Implementing Lists, Stacks, Queues, and Priority Queues (不要求)
 - Ch25 Binary Search Trees (不要求)
 - Ch26 AVL Trees (不要求)
 - Ch27 Hashing (不要求)
 - Ch28 Graphs and Applications (不要求)
 - Ch29 Weighted Graphs and Applications (不要求)

”Introduction to Java Programming (IJP): 10th/11th/12th Edition”

- Table of Contents (4/5)

- 10th Edition:

- Ch30 Multithreading and Parallel Programming
 - Ch31 Networking
 - Ch32 Java Database Programming (不要求)
 - Ch33 JavaServer Faces (不要求)

- 11th/12th Edition:

- Ch 30 Aggregate Operations for Collection Streams (不要求)

”Introduction to Java Programming (IJP) (10th Edition)”

- Table of Contents (5/5)
 - Ch34 Advanced JavaFX
 - Ch35 Advanced Database Programming
 - Ch36 Internationalization
 - Ch37 Servlets
 - Ch38 JavaServer Pages
 - Ch39 Web Services
 - Ch40 2-4 Trees and B-Trees
 - Ch41 Red-Black Trees
 - Ch42 Testing Using JUnit

成绩评定

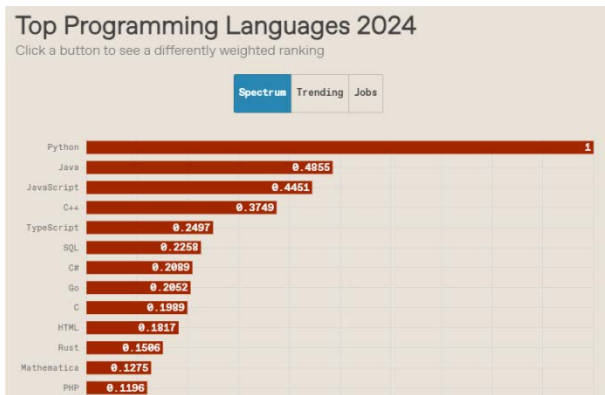
- 课程实验(28%)
- 课堂互动(2%)
- 课程作业(10%)
- 随堂测试(10%)
- 线上期末考试(10%) 【根据MOOC网站导出的数据】
- 线下期末考试(40%)

注：在ehall中期末考试占比可设置为70%, 60%, 50%(过程性考核), 40%(过程性考核) 或 30%(过程性考核)

特别说明

- 感谢：教材《Java大学实用教程》的作者在华信教育资源网提供PowerPoint讲义等资料！
- 说明：本课程所使用的讲义，是在公开的讲义和学院其他老师的讲义上修改的。

No.2



No.2



No.3

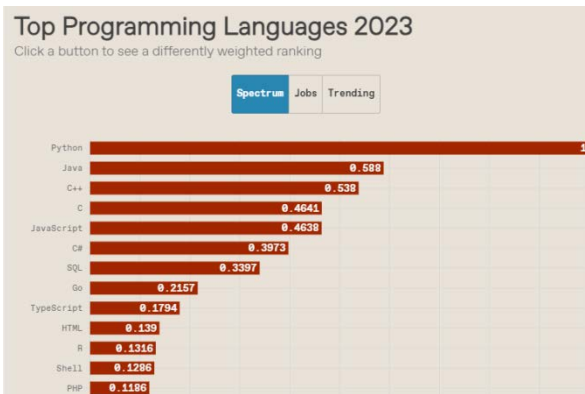


“At the top, **Python** continues to cement its overall dominance, buoyed by things like popular **libraries** for hot fields such as **AI** as well as **its pedagogical prominence**. (For most students today, if they learn one programming language in school, it’s Python.) Stalwarts like **Java**, Javascript, and C++ also retain high rankings ...”

Top Programming Languages 2024 by *IEEE Spectrum*

<https://spectrum.ieee.org/top-programming-languages-2024>

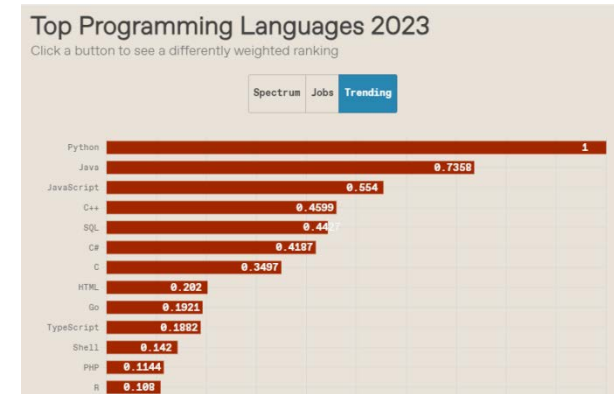
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No.3



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“But don’t let Python and SQL’s rankings fool you: Programming is still far from becoming a monoculture. **Java** and the various **C-like languages** outweigh Python in their combined popularity, especially for **high-performance or resource-sensitive tasks** where that interpreter overhead of Python’s is still too costly (although there are a number of attempts to make Python more competitive on that front). ”

Top Programming Languages 2023 by *IEEE Spectrum*

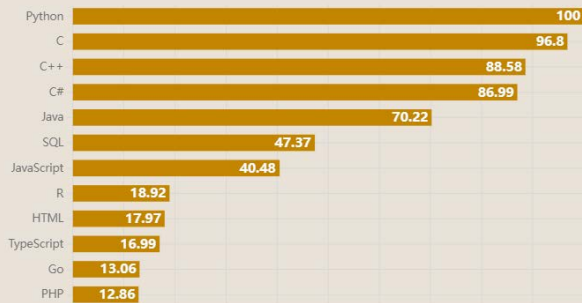
<https://spectrum.ieee.org/top-programming-languages-2023>

No.5

Top Programming Languages 2022

Click a button to see a differently-weighted ranking

Spectrum Jobs Trending

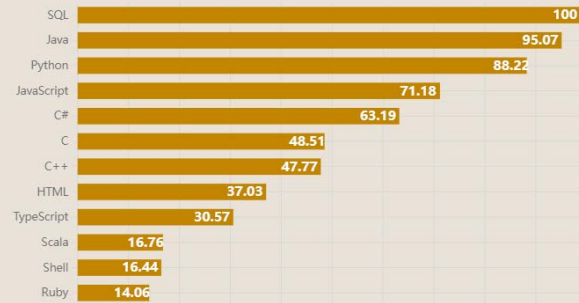


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Top Programming Languages 2022

Click a button to see a differently-weighted ranking

Spectrum Jobs Trending

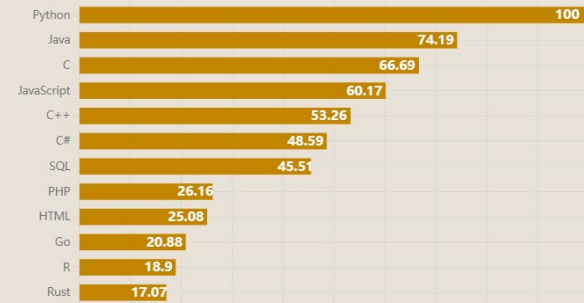


No.2

Top Programming Languages 2022

Click a button to see a differently-weighted ranking

Spectrum Jobs Trending



Top Programming Languages 2022 by *IEEE Spectrum*

<https://spectrum.ieee.org/top-programming-languages-2022>








Rank	Language	Type	Score
1	Python	  	100.0
2	Java	  	95.4
3	C	  	94.7
4	C++	  	92.4
5	JavaScript		88.1
6	C#	   	82.4
7	R		81.7
8	Go	 	77.7
9	HTML		75.4
10	Swift	 	70.4

IEEE SPECTRUM

No.2

Top Programming Languages 2021 by *IEEE Spectrum*

<https://spectrum.ieee.org/top-programming-languages-2021>

Rank	Language	Type	Score
1	Python ▼	  	100.0
2	Java ▼	  	95.3
3	C ▼	  	94.6
4	C++ ▼	  	87.0
5	JavaScript ▼		79.5
6	R ▼		78.6
7	Arduino ▼		73.2
8	Go ▼	 	73.1
9	Swift ▼	 	70.5
10	Matlab ▼		68.4

No.2

Top Programming Languages 2020 by *IEEE Spectrum*

<https://spectrum.ieee.org/at-work/tech-careers/top-programming-language-2020>

A Brief History of Java

- 1991: A group of **Sun Microsystems** engineers, led by Patrick Naughton and **James Gosling**
- 1995: SunWorld'95, the HotJava browser
- 1996: JDK 1.0
- ...
- 2004: Java SE 5
- 2006: Java SE 6
- 2009-2010: Sun Microsystems was **acquired by Oracle**
- 2011: Java SE 7
- 2014: Java SE 8 (较大改变的一个版本)
- 2017: Java SE 9
- **2018: Java SE 10, 11** (从2018年开始, 每6个月就会发布一个版本)
- **2019: Java SE 12, 13**
- **2020: Java SE 14, 15**
- **2021: Java SE 16, 17**
- **2022: Java SE 18, 19**
- **2023: Java SE 20, 21**
- **2024: Java SE 22, 23**

Java As A Programming Platform

- Java is a whole **platform (平台)**:
 - a good **language** (e.g., pleasant syntax and comprehensive semantics)
 - a huge **library** (e.g., fancy graphics, networking and database access, data mining package, recommender systems, etc.)
 - a high-quality execution **environment** that provides services such as security, portability across operating systems, and automatic garbage collection

More about Java

- [http://en.wikipedia.org/wiki/Java_\(programming_language\)](http://en.wikipedia.org/wiki/Java_(programming_language))
- Java is a computer programming language that is concurrent, **class-based**, **object-oriented**, and specifically designed to have as **few implementation dependencies** (依赖性) as possible. It is intended to let application developers "**write once, run anywhere**" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another.



James Gosling,
creator of Java



Logo



Duke (公爵), Mascot (吉祥物)