Object Oriented Programming

Semester 1 (2018-19)

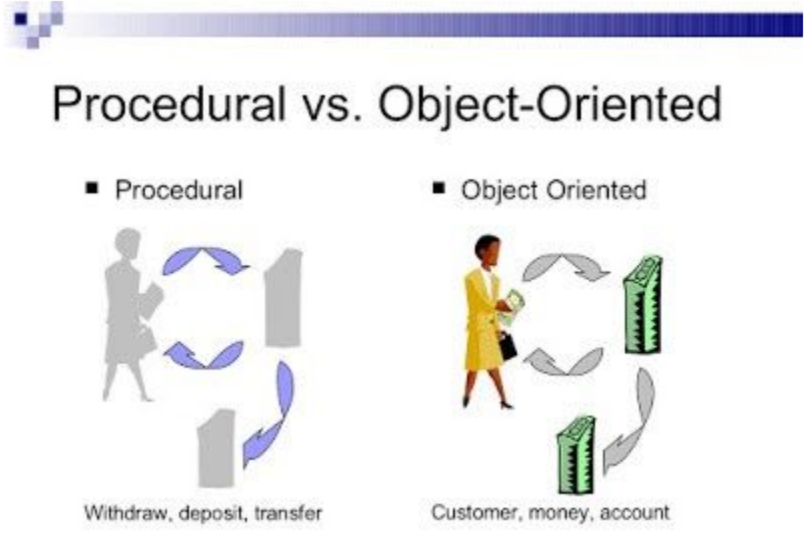
Volker Seeker

http://www.volkerseeker.com

THE UNIVERSITY *of* EDINBURGH

Course Overview

Why Object Oriented Programming?



Procedural vs. Object-Oriented

- Procedural

Withdraw, deposit, transfer

- Object Oriented

Customer, money, account

- learn an additional widely used programming paradigm

  ⇒ a new way to approach a problem

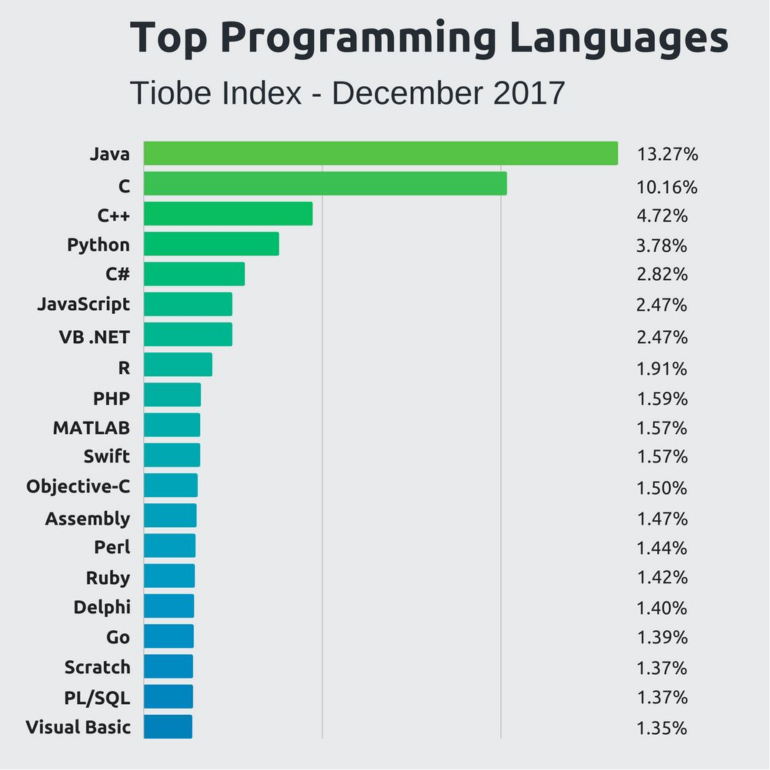
- get more practice at learning new languages

Why Java?

- Decently designed OO language
- Strong static typing
- Very popular
  - Huge ecology of libraries, frameworks and tools
  - High demand for later jobs

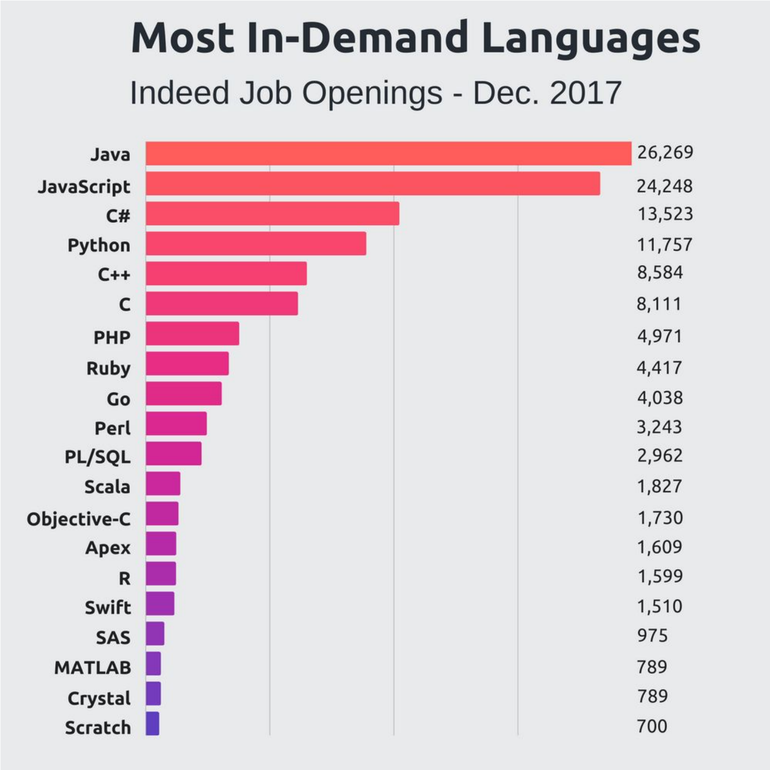
We are using **Java version 8**

Why Java?



Top Programming Languages

Tiobe Index - December 2017

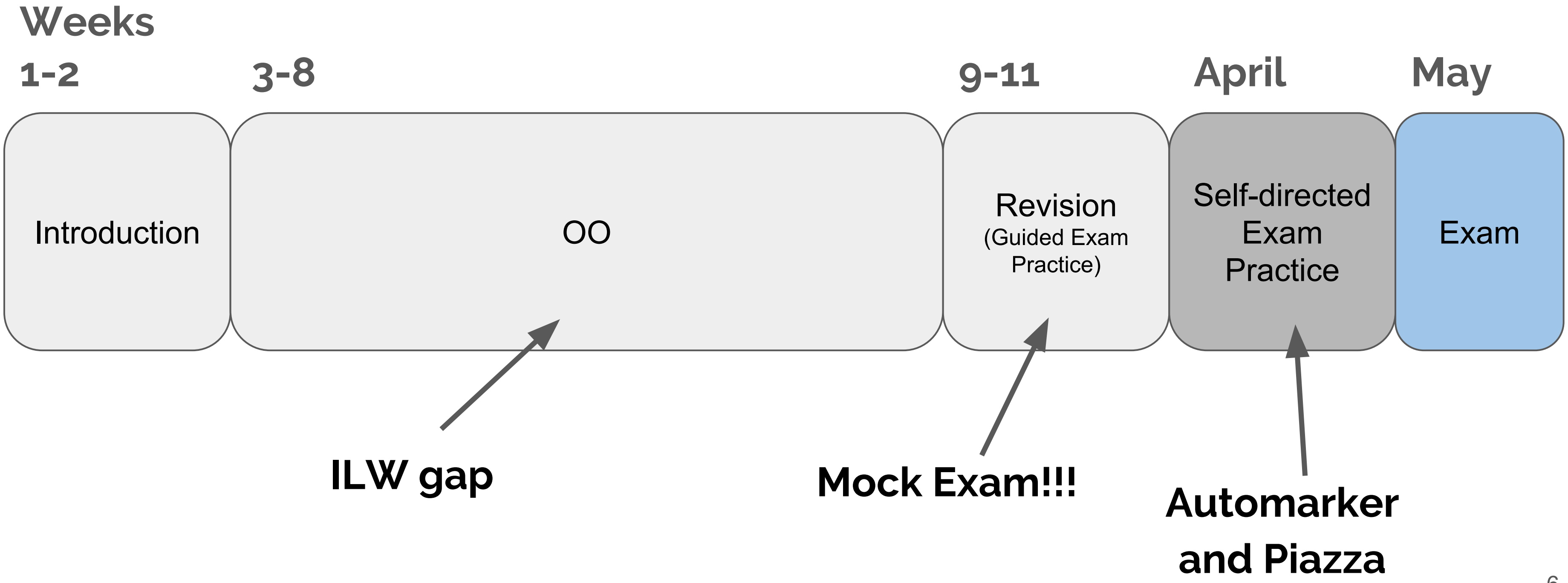


Most In-Demand Languages

Indeed Job Openings - Dec. 2017

- https://stackify.com/popular-programming-languages-2018/
- https://www.tiobe.com/tiobe-index/

How is it taught?



Weeks

1-2

Introduction

3-8

OO

9-11

Revision (Guided Exam Practice)

April

Self-directed Exam Practice

May

Exam

ILW gap

Mock Exam!!!

Automarker and Piazza

Weekly Events

- two lectures (week 1 - 9)
- one 2 hour lab session (week 1 - 9)
- one 1 hour tutorial session (week 2 - 9 + 11)

Lectures

Lectures

- 10:00 - 10:50 Tuesdays
- 12:10 - 13:00 Wednesdays

Learn Concepts and Techniques

- Target audience: You have taken INF1A
- You know the content of the imperative programming branch

- I like to have lectures interactive (to a degree)
- Second lecture to spread out the content and add some extras in the end
- recorded as usual and accessible via Learn

Labs

Labs

- Starting this week
- sign up via Learn

Regular Practice

- Regular exercises to improve your skills
- Can be carried out during lab session
- Demonstrator available during session for support
- You can work from home if you feel confident enough (**but know how to work with DICE!**)

- All labs available from week 1
- Extra week of scheduled labs to catch up

Labs

Labs

- Starting this week
- sign up via Learn

Regular Practice

- In 5.05 and 6.06 Appleton Tower
- Allocation is to manage space, feel free to turn up to other slots, but …
  - … if you have a clash for your allocated slot, make sure you get it changed by the ITO
  - … if there are not enough seats, those not allocated to this lab must leave

Labs

Labs

- Starting this week
- sign up via Learn

Regular Practice

- Feedback on lab exercises:
  - Use automated JUnit tests (you need them for the exam!)
  - Solutions are provided on the weekly lab page
  - Help from demonstrators
  - Discussion during tutorial (**initiated by you!**)

Tutorials

Tutorials

- Starting in week 2
- sign up via Learn

Knowledge Application

- Exercises regarding work on a larger project
- Broken down into 7 parts (**1st tutorial is intro**)
- Not as much programming work as labs but potentially harder and closer to the exam
- Tutorials are published a week in advance
- Solutions afterwards
- **Implement your own solution before the tutorial without checking the sample solution!**

Tutorials

Tutorials

- Starting in week 2
- sign up via Learn

Knowledge Application

- A chance to ask questions in a small group about course content and labs
- Your tutor is your best source of feedback on your progress
- To get the most out of your tutorials, prepare questions or issues you want your tutor do address and send it to them up front

Tutorials

Tutorials

- Starting in week 2
- sign up via Learn

Knowledge Application

- Mock exam in week 10
- final tutorial in week 11
    - discuss mock exam and solutions
    - practice with old exams

How is it taught?

Weeks

1-2	3-8	9-11	April	May
Introduction	OO	Revision (Guided Exam Practice)	Self-directed Exam Practice	Exam

Lectures	**Theoretical Background**
Labs	**Regular Exercise**
Tutorials	**Knowledge Application**

Resources

Introduction to Programming in Java
Horstmann JAVA for Everyone
Java Concepts
Effective Java Second Edition
Data Structures & Problem Solving Using JAVA
Learning Java
Small JAVA How to Program
Data Structures & Algorithms in JAVA
The Java Tutorial Fourth Edition
Java Cookbook
Agile Java
JAVA in a Nutshell
Introduction to JAVA Programming
BIG JAVA
Head First Java

The Java Tutorial: A Short Course on the Basics, Addison-Wesley, 6th Edition.

- Contains a lot more than you need for this course.
- Available from library as ebook, see Learn page

Resources

To get you started:

- Oracle Java tutorials
- Java Language Spec
- API Spec
- Tutorials Point
- Lynda
- Stackoverflow

but there are many many sources: feel free to browse and find things that suit your own style

Who to contact for help?

- **Lecturer:** Volker Seeker (office hours)
- **TA:** Naums Mogers
- **Course Page**: Learn
- **Piazza**: see Discussions link on Learn
- **Tutors and Demonstrators**
- **ITO:** AT level 6; source of all admin knowledge

Who to contact for more help?

- **Fellow Students:** feel free to work in groups
- **InfBase:** Drop in helpdesk (Link)
- **InfPals:** student-to-student study groups (Link)
- **Programming Club**: For more programming practice (Link)
- **Societies:** CompSoc or Hoppers
- **Better Informatics:** https://betterinformatics.com

Assessment

- Mostly *formative* - labs and tutorials to help you learn and give you feedback on how you're doing.
- The only *summative assessment* is the final programming exam - this determines your mark.

Programming Exam

- Scheduled as part of the normal exam diet
- Similar to INF1A on DICE machines in “exam mode”
- 2 hours long (we do not aim to put you under time pressure)
- Open Book:
    - some online documentation provided
    - you may take in anything you like on paper or USB stick

Minimum Hurdle

In order to get marks for your submissions during the exam, you must follow those two rules:

1. All Code you submit must compile!
2. All Code you submit must pass some basic JUnit tests.

If not, you will get zero marks for the corresponding questions. No partial marks, nothing!

Exam Practice

- You will receive **guided exam practice** during the last three weeks of the semester
    - Revision lecture
    - Mock exam
    - Tutorial

- You should make good use of the time before the exam to **practice on your own** with old exams.
    - An online automarking service will be available
    - Make use of Piazza and discuss solutions for old exams to help each other

I already know lots of Java and OO

Great - Keep Practicing!

- Make sure you really know what is taught and don't just think you do!
- There is additional material on the Lab page (advanced lab exercises)
- **Go to the Programming Club!**

How is it taught?

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Questions?

Sources

- Slides are adapted from an earlier version by Perdita Stevens and Ewan Klein
- https://hackernoon.com/top-5-object-oriented-programming-and-design-courses-for-programmers-ad49f0870de4
- https://stackify.com/popular-programming-languages-2018/
- https://www.tiobe.com/tiobe-index/
- https://www.theodysseyonline.com/your-brain-is-muscle-exercise-it