Al-Baath University, Faculty of Informatics Engineering
Department of Software Engineering, 4th Year Students
Academic Year 2018-2019, 2nd Semester

Programming Languages

Introduction

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Acknowledgment

- This document, and most of the course, are based on the course "Programming Languages" crated by University of Washington. 2013

About the course

This course is an introduction to the basic concepts of programming languages, with a strong emphasis on functional programming. The course uses the ML as vehicle for teaching the concepts, but the real intent is to teach enough about how any language "fits together" to make you more effective programming in any language -- and in learning new ones. So, the course uses Python and Java to confirm that you got a clear understanding of the concepts.

This course is neither particularly theoretical nor just about programming specifics -- it will give you a framework for understanding how to use language constructs effectively and how to design correct and elegant programs. By using different languages, you will learn to think more deeply than in terms of the particular syntax of one language. The emphasis on functional programming is essential for learning how to write robust, reusable, composable, and elegant programs. Indeed, many of the most important ideas in modern languages have their roots in functional programming. If there will be enough time, the course will introduce Jython () , which allow Python scripts to be executed on the JVM.

Get ready to learn a fresh and beautiful way to look at software and how to have fun building it.

1. Many essential concepts relevant in any programming language
    - And how these pieces fit together
2. Use ML(Meta Languages) languages:
    - They let many of the concepts "shine"
    - In many ways simpler than Java, C#, Python, …
3. Big focus on functional programming
    - Not using mutation (assignment statements) (!)
    - Using first-class functions (can't explain that yet)
    - But many other topics too
4. Python
5. Jython

Objective

Learning to think about software in this "PL" way will make you a better programmer even if/when you go back to old ways. It will also give you the mental tools and experience you need for a lifetime of confidently picking up new languages and ideas.

Grading

- Assignments: 2 pts
- Student's Effort: 3 pts
- Practical Quiz: 10 pts
- Final Practical Exam: 15 pts

Tools

- SML (Standard Meta Language) by using SML compiler: SML/NJ 110.80
- NotePad++

Notes

- All your questions about what we have learned in lab are welcomed at any time
- Feel free to contact us: abdo.darboolei@hotmail.com

Good Luck

Eng. Abdo Darbooli

Homs, 3 March 2019