WELCOME TO COMPUTER PROGRAMMING
Reimo Palm

Lecturer in Theoretical Informatics
Institute of Computer Science, University of Tartu

PhD in Computer Science

reimo.palm@ut.ee
Course Objectives

This is an introductory programming course.

After passing this course the student:

• knows and can use fundamental programming constructions: variables, expressions, assignments, conditionals, loops, subroutines, recursion, simple input/output
• knows basic datatypes and -structures (numeric types, booleans, strings, lists) and can use corresponding standard operations
• can analyze and explain in detail the behavior of simple programs, and modify, complement and develop them
• can design algorithms for solving simple problems, and implement, test and debug the corresponding program
• can implement projects related to programming in collaboration with teammates
Course Overview

Materials - [https://courses.cs.ut.ee/](https://courses.cs.ut.ee/)

Quizzes, homeworks, grades - [https://moodle.ut.ee/](https://moodle.ut.ee/)
Sessions

• **Before**
  • Video
  • Quiz
  • Programming homework

• **Sessions on Thursdays**
  • Review of material where needed
  • Follow-up exercises
  • Pair programming
Grading

https://courses.cs.ut.ee/2019/progeng/

• Lecture quizzes
• Homeworks + practice sessions
• Project
• Two tests
• Exam
• Supplementary exercises
Software

- Thonny - [https://thonny.org/](https://thonny.org/)
  - Python 3

- IDLE or Notepad++

- CMD???
Programming

• Computers want to be helpful
  – but we need to speak their language

• Programmers are people who know how to communicate with computers in a programming language
  – They know how to write programs

• A Program is a sequence of stored instructions (commands)
  – Programmers figure out the sequence and encode it
Python

• Python is a programming language developed by Guido van Rossum in 1991
• A way to communicate with computers and encapsulate our instructions
• Emphasizes readability, clarity, simplicity
• On the other hand, it supports multiple programming paradigms, is highly extensible and is suitable for programming in all scales.
Why Python?

Java:
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, world!");
    }
}

Python:
print("Hello, world!")
Advice

At the beginning, the language is new. It is hardly possible to pick up a new language overnight.

There will be lots of mistakes (e.g. *syntax errors*):

- PC is neither cruel nor making jokes
- It says: “*I don’t understand what you are saying.* I only know a few words. Please speak Python.”
- Be prepared that PC doesn’t correct you as teachers do. It can hardly listen or understand our awkward *Shakespearian* Python

Keep going, wondering throughout, editing, playing, understanding

- It is easier to learn Python than to make computers understand English
Interactive or script

Interactive Python

- Type directly one line at a time and Python responds
- It is good for experiments and programs of 3-4 lines

Python Script

- Enter a sequence of statements (lines) into a file using a text editor and ask Python to execute the statements in the file
- Add .py as the suffix on the end of these files to indicate they contain Python