WELCOME TO
COMPUTER PROGRAMMING

HOW DOES COMPUTER PROGRAMMING WORK?

MAGIC.
Ljubov Jaanuska

MSc in computer science

Teaching Assistant in Informatics
Institute of Computer Science, University of Tartu

ljubov.jaanuska@ut.ee
WHAT ABOUT YOU?

Name?

What are you studying?

Where are you from?

Previous experience?
Why should we learn programming?
Course overview


Tests, submission of exercises, points - https://moodle.ut.ee/
Grading

https://courses.cs.ut.ee/2017/nkp/fall/Main/Grading

Tests
Homework + participation in the sessions
Project (formulation + solution)
Mid-term test
Exam (test on paper + programming exercise)
Sessions

• Before:
  • Video
  • Test
  • Homework

• Sessions
  • Wednesday
  • Thursday
Software

• Python 2 or Python 3
• IDLE or Notepad++
• CMD???
Questionnaire

https://goo.gl/forms/7oI4hpqhQjiOWMru1
By now...

- Independently covered 2 chapters of Charles Severance:
  - 2 videos lectures
  - 1 test
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

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

• Python
  • A programming language developed by Guido van Rossum in 1991
  • A way to communicate with computers and encapsulate our instructions
Advice

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

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

• PC is not cruel nor making jokes
• It says: “I don’t understand what you are saying. I only know a few words. Please speak in Python.”
• Be ready that PC don’t correct you as teachers do. They can hardly listen or understand our awkward Shakespearian Python

Keep going, wondering throughout, editing, playing, understanding

• It is easier for you to learn Python than to make computers understand English
WHY PYTHON?

Python:
```python
print "Hello, world!"
```

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

• Interactive Python
  • You type directly one line at a time and Python responds
  • Is good for experiments and programs of 3-4 lines

• Python Script
  • You enter a sequence of statements (lines) into a file using a text editor and tell Python to execute the statements in the file
  • add `.py` as the suffix on the end of these files to indicate they contain Python

```
prog1_1.py - /Users/Lj/Downloads/prog1_1.py (2.7.13)

"Hello, World!"
```
Chapter 2 - Expressions

Variables

- *mnemomically* named place in the memory where a programmer can store data and later retrieve data using the variable name
  - Must start with a letter or underscore `_`
  - Must contain letters, numbers or underscore
  - Case sensitive

Constants

- Numbers, letters, and string are constants
- They do not change their value
  - 123  98.6  ‘Hello, world’ “Hello, world”
- `type()`
  - Types  `int`  `float`  `str`
  - Type conversion  `int()`  `float()`  `str()`
Expressions

• Assignment statement
  • e.g. \( x = 2 \)
  • Hey, Python, go and find a place called ‘x’ and store there 2

• Assignment with expression (e.g. \( x = x + 2 \) )

• Operators
  • Addition +
  • Substraction -
  • Multiplication *
  • Division /  

  * Truncated division \( 450 / 100 \) result is 4 vs \( 450.0 / 100 \) result is 4.5
  • Power **
  • Remainder or modor %  

  * (450 % 100 result is 50)

Order of evaluation (operator precedence) ( ) ** */% +- left to right
Expressions

- Reserved words (e.g. `print`, `for`, `elif`, `while`)
- User input `raw_input('Hello')`
- Comments `#`
Test1

Questions?