

Forritunarmálið Python

Dagur 1

Course schedule

- Classes
- Evaluation
 - Assignments
 - Mooshak assignments
 - Competition
 - Larger assignments
 - Final
 - Home exam, auto-graded and open book
- Mooshak
 - Examples
 - Time limit exceeded
 - Sorted output
- Book

About Python

- Python
 - Interpreted vs compiled
 - Python bytecode
 - Python 2 vs 3
 - Things that are different between Python 2 and 3 are marked with (*Py23*)
 - Open source language (CPython)
 - Developed by the community
 - Python Enhancement Proposals (PEP)
 - Python implementations
 - CPython, Jython, PyPy,...
 - IDEs
 - Idle, PyCharm, Idle, honny

Python basics

- Two "modes" of python
 - REPL
 - Script
- Math operators
 - `+, -, *, %, /, //, **`
 - `==, !=, <, <=, >, >=` (`<>`)
 - `<<, >>, ^, &, |, ~`
 - Integer and floating point division (*Py23*)
 - power
 - Integers are big-integers (*Py23*)
 - Hex and octal integers (*Py23*)
- Floating point numbers
- Complex numbers

- Strings
 - Unicode strings (*Py23*)
 - Syntax
 - multiline strings
 - raw strings
 - Concatenation
 - Repetition
- Lists
 - Concatenation
 - Repetition
 - Member access

- Variables
 - Dynamically typed
 - Duck typing
 - type
- *Everything* is an object
 - Variables are objects
 - Numbers are objects
 - Functions are objects
 - Modules are objects
 - `is` vs `==`

- `dir, help`
- `len`
- "Boolean"
 - True/False
 - Synonyms for 0 and 1
 - "Boolean" operators
 - and, or, not
 - Short circuit
 - bool
- `print (Py23)`

Running python as a script

- Python has two "modes"
 - Interactive mode, or REPL
 - Script mode
 - Also possible to run script and then enter REPL

Windows

- GUI method
 - Double-click on python file
 - A python terminal will open while the script is running and close as soon as it stops
- Command line method
 - Open cmd/powershell
 - `C:\...> py file.py` or `C:\...> file.py`

Linux/MAC OS

- Run with Python
 - Open a terminal
 - `$ python3 file.py`
- Shebang method
 - Put the line `#!/usr/bin/env python3` at the top of `file.py`
 - Run `$ chmod +x file.py` or `$ chmod u+x file.py`
 - To run Python script run `$./file.py`

More Python basics

- Control structures
 - Indentation
 - If/elif/else
 - Chained comparison
 - pass
 - Loops
 - while/for/else
 - range
 - iter, next
 - enumerate
 - zip
 - break/continue

- None
- Einföld föll
 - def
 - parameters
 - return types
 - docstrings

Parameters

- Positional
- Named (with default value)
- Variable-length arguments
- Variable-length keyword arguments

Scope

- Only created by functions!
- `global`
- `locals()` and `globals()`