Intro to Python
Course overview, Introduction

Majid Sohrabi

National Research University Higher School of Economics

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Contacts

- Majid Sohrabi

  – Assistant, PhD Student, School of Data Analysis and Aritificial Intelligence

  – Research Assistant, Laboratory for Models and Methods of Computational Pragmatics

  – Email: msohrabi@hse.ru

  – Telegram: @MSohrabi_CS

Repository with course material

https://github.com/Majid-Sohrabi/Intro_to_Python_2024

Course content

► Introduction into Python (Syntax)

  – Intro to Anaconda, Jupyter Notebook, and other similar environments

  – Data types: integers and strings. Input and output. Strings formatting

  – Data types: floating-point numbers and boolean. Logical operators. Conditionals

  – Different types of loops

  – Data types: lists and tuples. For loop

  – Methods I (Strings)

  – Methods II (Lists)

  – Data types: sets and dictionaries

  – Nested Structures

  – Functions

  – Working with files in Python

  – Python and data science

  – Introduction to MNE-Python tools

Overview

▶ Compulsory course for year 1

▶ Cognitive Sciences and Technologies: From Neuron to Cognition

▶ Duration: 2nd half of the academic year (modules 3 and 4)

▶ Assessment elements:

  – Homework assignments (30% weight)

  – Quizzes (20% weight), in class short quizz

  – Exam/Project Defence (50% weight), in the form of a project, with **progress tracked during the semester** (topic choice deadline, preliminary results deadline, final result deadline)

▶ Format: Offline (lecture and seminar)

  – Online

The formula

Final grade $= 0.3 \cdot$ Homework score $+ 0.5 \cdot$ Exam score $+ 0.2 \cdot$ Quizz

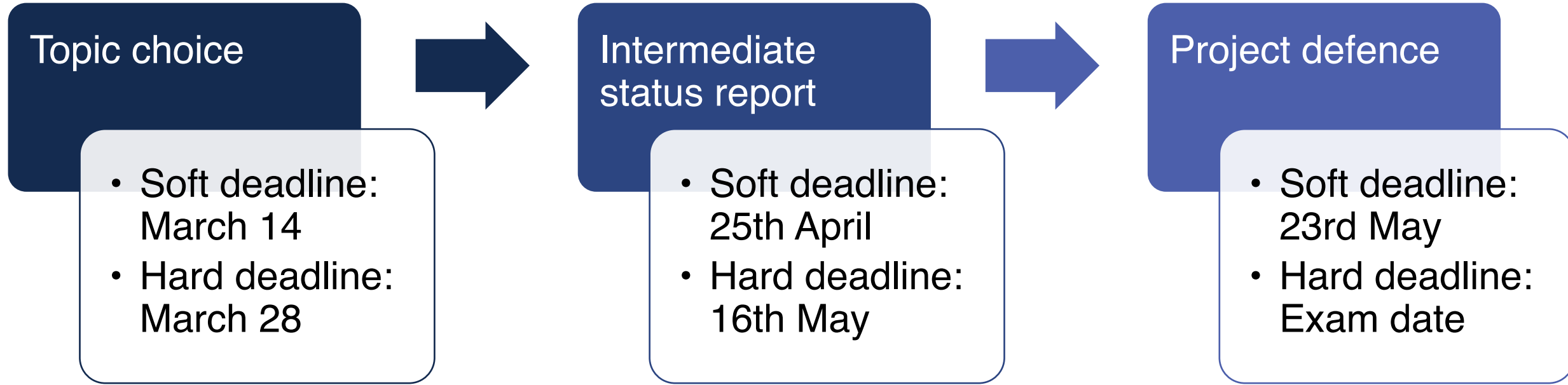$0 \leq$ Exam score ≤ 10

Rounding to the closest integer

Homework

- Small set of tasks (jupyter notebooks)

- Solve tasks to earn points

- Deadline: 1 week per homework

- Homework grade $= 10 \cdot \min\left(1, \dfrac{\sum \text{points}}{\text{total}}\right)$

Exam

► Exam in the form of project defence

  – Teams of up to 2 people are OK (roles of all members of a team should be clear and significant)

► Project is either:

  – Participation in a competition (on www.kaggle.com or similar)

► Or:

  – Making comprehensive analysis on a dataset using Python and MNE-Python libraries

► **Please discuss your choice with me**

Exam project timeline

Topic choice
- Soft deadline: March 14
- Hard deadline: March 28

Intermediate status report
- Soft deadline: 25th April
- Hard deadline: 16th May

Project defence
- Soft deadline: 23rd May
- Hard deadline: Exam date

▶ Missing any of the hard deadlines adds a –0.5 points penalty to the exam grade (for each of the missed deadlines)

▶ Meeting any of the soft deadlines adds a +0.5 points bonus to the exam grade (for each of the met deadlines)

Thank you!

✉ msohrabi@hse.ru

✈ @MSohrabi_CS

@MSOHRABI_CS

Exercise

▶ 1) Find the maximum element in the following sequence:

– A = [7, 4, 9, 2, 8, 88, 83, 12]

Exercise

▶ 2) Find the minimum element in the following sequence:

- A = [7, 4, 9, 2, 8, 88, 83, 12]

Exercise

▶ 3) Sort the elements in the following sequence in ascending format:
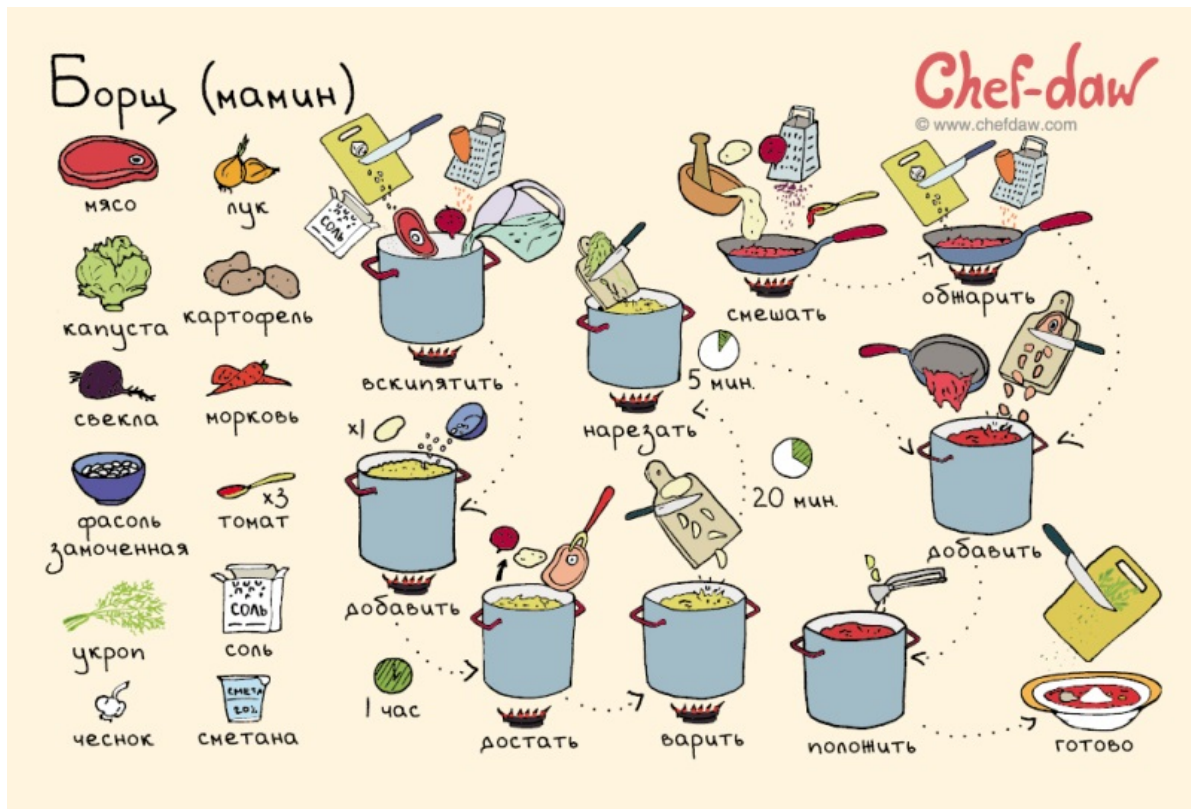
    – A = [7, 4, 9, 2, 8, 88, 83, 12]

Exercise

▶ 4) Sort the elements in the following sequence in descending format:

 – A = [7, 4, 9, 2, 8, 88, 83, 12]

Exercise

▶ 5) Calculate the average of elements for the following sequence:

– A = [7, 4, 9, 2, 8, 88, 83, 12]

What does programming look like?

Why do we need languages?

How do programs look for the PC?

1 Leave only three first letters in each word

2 In those three-letter words change all 'a' letters to '@' symbol

3 Change all 'o' letters 'o' to '0'

4 Join all the pieces with a dash sign

How do programs look for the PC?

1 Leave only three first letters in each word
ima men opt man

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What we will be doing?

1

Think how we would approach a problem

What we will be doing?

2

Write step-by-step solution for a human

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Translate our solution to a language that computer can understand

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4

Check that our code works properly