

CS1302 Introduction to Computer Programming

Course overview

Prof. Weitao Xu

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About the course

This course aims to introduce key concepts, techniques, and good practices of programming using a high-level programming language Python.

Course Intended Learning Outcomes (CILOs):

1. Explain the structure of a computer program.
2. Analyze, test and debug computer programs.
3. Apply proper programming techniques to solve a task.
4. Construct well-structured programs.

About the course

- **Lecturers**

Dr. Chung Chan, chung.chan@cityu.edu.hk (Course leader, Course management)

Dr. Weitao Xu weitaoxu@cityu.edu.hk (Teaching)

Dr. Helena Wong, cshwong@cityu.edu.hk (Teaching)

- **TAs**

- We have about 20 TAs to offer assistance on teaching and QA sessions.

- **Teaching mode**

- Lecture : On-campus face-to-face

- Labs: On-campus face-to-face

Lectures/Labs will be recorded on Zoom, but the recording is used for review purpose.
You're encouraged to attend the class physically.

Attendance will not be marked, but individual lectures may record attendance for progress check.

Assessment

- Coursework (50%) :

1. Assignments: 30% = E-Quizzes (24%)+CE-Quizzes (6%)

2. Midterm Quiz: 20%

- Date: 28-Feb-2026 (Saturday) 18:30-19:30, mark it on your calander
- Computer-based: you will use Safe Exam Browser on the provided computers to access the exam (without connection to Internet during exam except Canvas).

- Final Exam (50%)

The final exam will be on computer, and the duration is 2 hours.

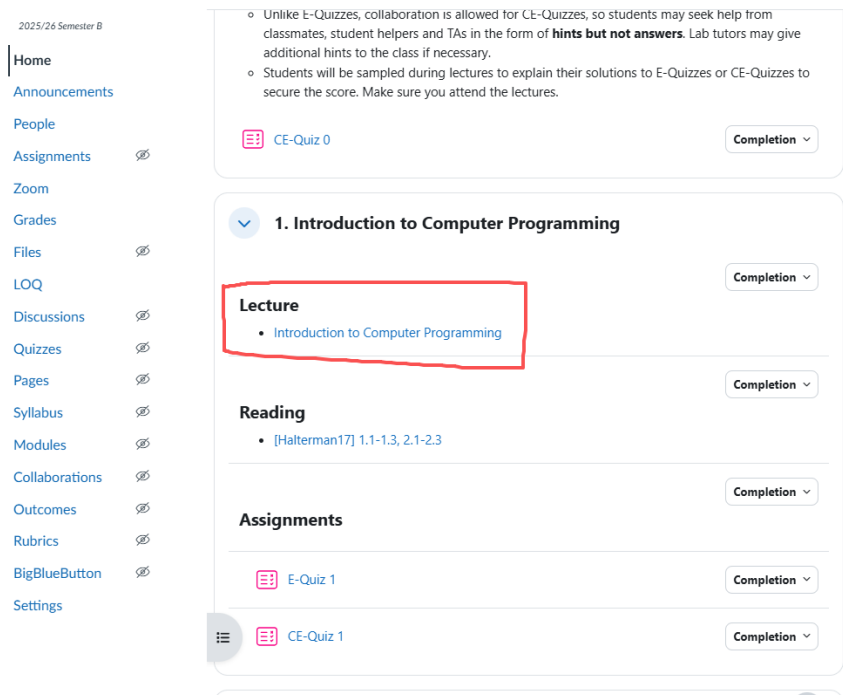
Passing criteria:

At least 30% of the maximum mark for the examination must be obtained.

- The distribution of scores is different every year, so it's hard to tell the boundaries of A+/A/A-/B+/B/B-.
- The final grade is determined by the relative position of your score (top 3%, 20%, 50%) but not the absolute value of your score (90, 85,70..)

Course materials

- Course contents are delivered in the Jupyterhub platform



- Textbook

Halterman, R. L. "Fundamentals of Python programming." (2017)

- [E-Book available from openlibrary.org \(Links to an external site.\)](https://openlibrary.org)
- [Source code available from GitHub repository](#)

Course materials

1. Introduction to Computer Programming

Completion ▾

Lecture

- [Introduction to Computer Programming](#)

Completion ▾

Reading

- [\[Halterman17\] 1.1-1.3, 2.1-2.3](#)

Completion ▾

Assignments

- [E-Quiz 1](#)

Completion ▾
- [CE-Quiz 1](#)

Completion ▾

The window is too small?
Try to right-click, and “Open link
in new tab”

Assignments

E-Quiz 1

CE-Quiz 1

Completion ▾

Completion ▾

Open link in new tab

Open link in split view

Open link in new window

Open link in incognito window

Save link as...

Copy link address

E-Quiz

E-Quiz 1

Receive a grade

Opens: Monday, 19 January 2026, 12:00 AM

Closes: Sunday, 25 January 2026, 11:59 PM

Instructions

This is an **iRAT** (Individual Readiness Assurance Test) that assesses your personal understanding of the lecture material.

Timing

- The **opening and closing times** are displayed on this cover page.
- Your answers are **automatically submitted** at the closing time, after which you can review your scores and answers.
- If you click **Finish attempt...** and then **Submit all and finish**, you will no longer be able to view or modify your answers.

Answer Checking Options

Each question may include one or both of the following buttons:

Check Button

- Allows you to verify your answer **before submission**.
- **Penalty applies** for incorrect attempts, E.g., you may see
 - **10%** for programming questions; and
 - **100%** for True/False questions.
- Designed to discourage random guessing.
- For programming questions, there are **hidden test cases** that are evaluated only after submission to prevent test-specific solutions.

Precheck Button (Programming Questions Only)

- Lets you test your solution against a **smaller set of test cases** than what the **Check** button does.
- **No penalty** is applied.

Read the instructions carefully

CE-Quiz

CE-Quiz 1

Receive a grade

Opens: Monday, 26 January 2026, 12:00 AM

Closes: Wednesday, 28 January 2026, 11:59 PM

CE-Quiz Instructions

The **CE-Quiz** (Collaborative E-Quiz) assesses your understanding of the relevant topics in a **Collaborative Mode with Socratic AI**.

- Questions are mostly selected from E-Quiz questions.
- You must take the CE-Quiz **on site** at the venue for your assigned section during its scheduled time.
- Similar to the closed-book midterm and examination, students must use the **Safe Exam Browser on a Lab PC** (NOT students' laptops) to do the test. Other electronic devices such as smart glasses and mobile phones are not allowed. Forbidden devices must be placed inside the bag or at the front of the venue.
- While collaboration is allowed for CE-Quizzes, you may
 - use [OPTMentor](#), an AI-assisted Visual Debugger;
 - seek help from classmates, student helpers and TAs in the form of **hints but not answers**.

Timing

- The assessment is **only available during the Lab period**.
- Your answers are **automatically submitted** at the closing time.
- You can **view your score** and **review your attempt** from this cover page after the closing time.
- If you click **Finish attempt...** and then **Submit all and finish**, you will no longer be able to view or modify your answers.

Answer Checking Options

Each question may include one or both of the following buttons:

◆ **Check Button**

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Read the instructions carefully

Academic Honesty

is regarded as a serious academic offence in the University.

Do assignments and exercises **on your own**

“**On your own**” means

- ✓ discuss the problems with any other people.
- ✓ study materials available on the internet.
- ✓ refer to books.

But the details and write-up must be entirely your work.

The **principle** is: **Students should gain through practicing and developing skills in doing your work.**



Academic Honesty

is regarded as a serious academic offence in the University.

Do assignments and exercises **on your own**

Deserved mark?

Unfair situation ✕

You should not create any chance for other students to copy your work.

For any plagiarism case,

- The student who plagiarizes will be punished.
- Any student who allows his/her work to be copied will **also** be punished.

Do students in the following cases demonstrate academic honesty?

Case 1

- Chi Wai did some research on the Internet and found some useful sources for his assignment. He used the ideas from these sources but forgot to cite the sources in the text of his assignment and provide a reference list.

Case 2

- Mia searched the Internet and found a useful diagram. She modified the diagram and included it in her assignment, but did not cite and reference the source.

Case 3

- Nick handed in the same assignment for more than one subject/course.

Case 4

- Xiaobo copied his assignment from a classmate's work, put his own name on it and submitted it to his teacher.

Case 5

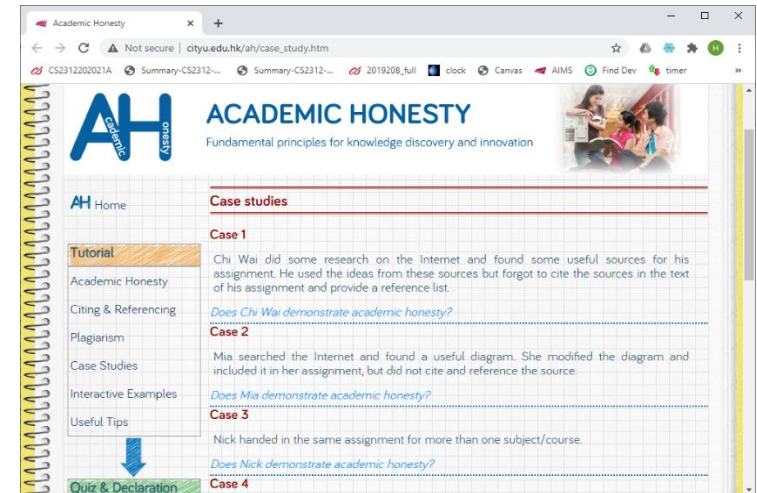
- Kit gave Suki his assignment and Suki copied it, put her own name on it, and submitted it to her teacher.

Case 6

- Chloe and Eason worked on an individual assignment together. They each did a different part of the assignment. Then, they shared their work, put their own name on the assignment and individually submitted the work to their teacher.

Case 7

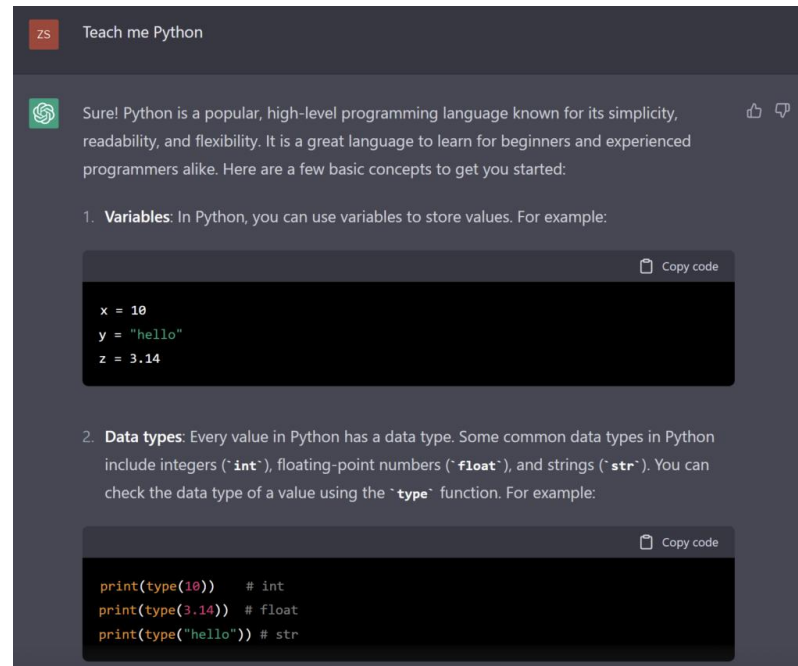
- Ming and Doris discussed some ideas about how to do an individual assignment. Then, they completed the assignment on their own, without looking at each other's work. They put only their own name on their assignment and individually submitted their work to their teacher.



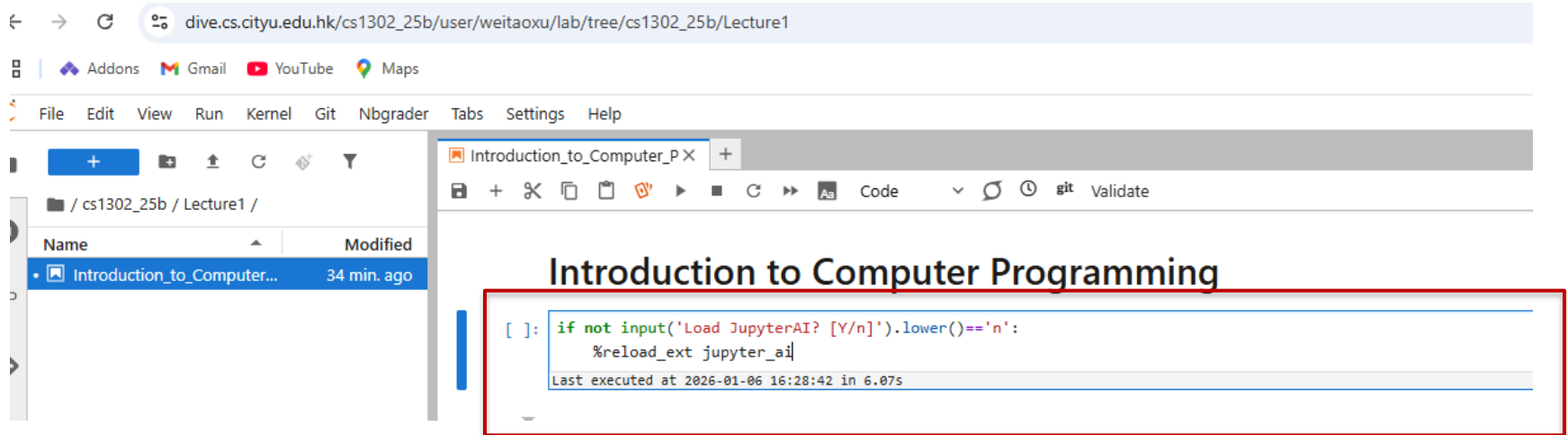
<https://www.cityu.edu.hk/ah/Tutorial/casestudy>

Can I use ChatGPT

- You're free to use any tools that can help your study, but you won't have access to Internet during the midterm/final exams



Generative AI is also available in the notebooks



The screenshot shows a JupyterLab interface. The browser address bar displays `dive.cs.cityu.edu.hk/cs1302_25b/user/weitaoxu/lab/tree/cs1302_25b/Lecture1`. The left sidebar shows a file explorer with a folder `/ cs1302_25b / Lecture1 /` containing a file `Introduction_to_Computer...` modified 34 minutes ago. The main area shows a notebook titled `Introduction_to_Computer_P X` with a code cell containing the following Python code:

```
[ ]: if not input('Load JupyterAI? [Y/n]').lower()=='n':  
      %reload_ext jupyter_ai  
Last executed at 2026-01-06 16:28:42 in 6.07s
```

A red box highlights the code cell, and a red arrow points from it to the text below.

Run the following cell to ask AI how to define a computer:^[2]

```
[2]: %%ai  
      What defines a computer? Explain in one line.  
Last executed at 2026-01-08 22:13:53 in 1.72s
```

[2]: A computer is an electronic device that can be programmed to store, process, and output data.

About the course – Key to Success

Practice with understanding

The solution is not everything.

You need to learn **the approach** to build the solution step by step.

Learn from errors (**debugging strategies**)

Mistakes are often **good teachers** 💰

Digest well to learn the 100%

Memorizing and dictation,
if without understanding,
are worthless,
especially in a programming course!

Python is a tool to solve questions

In some courses, what you learn
in the class

$$\begin{aligned}x^2 + 2 &= 18 \\ x^2 &= 18 - 2 \\ x &= 4\end{aligned}$$

similar



What you see in the exam

$$\begin{aligned}x^2 + 9 &= 100 \\ x^2 &= 100 - 9 \\ x &= 8\end{aligned}$$

In this course, what you learn in
the class

Python for loop
A for loop is **used for iterating over a sequence and iterables** (like range, list, a tuple, a dictionary, a set, or a string).

```
for i in range(5):  
    statement 1  
    statement 2  
    ...  
    statement n  
else:  
    statement(s)
```

Indentation
Loop body is must be properly indented

Definite iterations.
(Total 5 iterations)

Body of for loop
Execute till the last item of a sequence

Else Block (optional)
Execute only when for loop executes normally

PYnative.com

unseen



What you see in the exam

Example 1: Program to print half pyramid using *

```
*  
* *  
* * *  
* * * *  
* * * * *
```

Source Code

```
rows = int(input("Enter number of rows: "))  
  
for i in range(rows):  
    for j in range(i+1):  
        print("* ", end="")  
    print()
```

After this course

Become a Programmer



Cool and fun

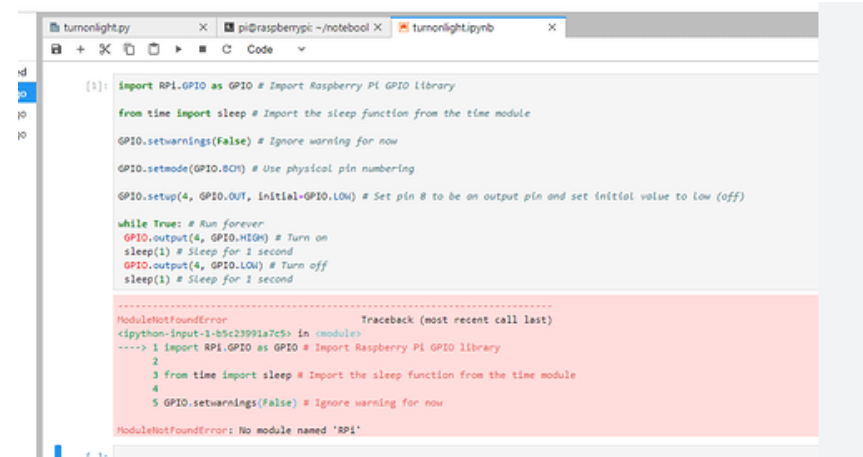
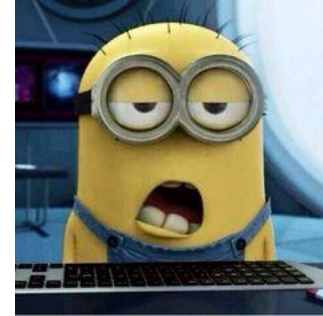


But being a programmer (程序猿)...



What to expect

- Programming is fun
- *Learning programming may not!*
- You'll see lots of syntax (rules for programming languages), yes they may look boring...
- You'll see lots of errors, that'll take you lots of time to fix...

A screenshot of a Jupyter Notebook interface. The top bar shows three tabs: 'turnonlight.py', 'pi@raspberrypi: ~/notebook X', and 'turnonlight.ipynb'. The notebook contains a Python script that attempts to use the RPi.GPIO library to control an LED. The script includes imports for RPi.GPIO and time, sets up pin 4 as an output, and enters a loop that turns the LED on and off with 1-second delays. Below the script, a red error message is displayed: 'ModuleNotFoundError: No module named 'RPi''. The error message includes a traceback showing the line numbers where the error occurred.

What to expect

- To have fun, usually we need to go through lots of detail stuff first -> learning curve

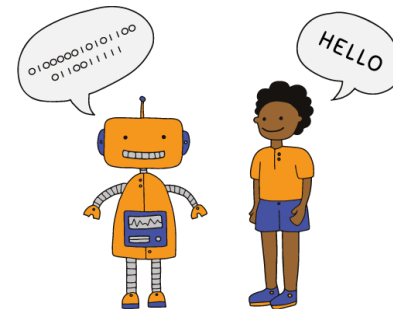


Positive thinking

- You learn a language .. What are the stories behind the details? You *communicate* with the language.
- You create solutions and solve mistakes
 - You are winning the games!

One more tip

- If the computer says you're wrong, you are wrong!
Don't doubt the computers, ever. They are always right
(unlike CNN or Trump...)



- Focus on finding out what make the computer think you're wrong
 - Debug
 - [Why are they called bugs?](#)



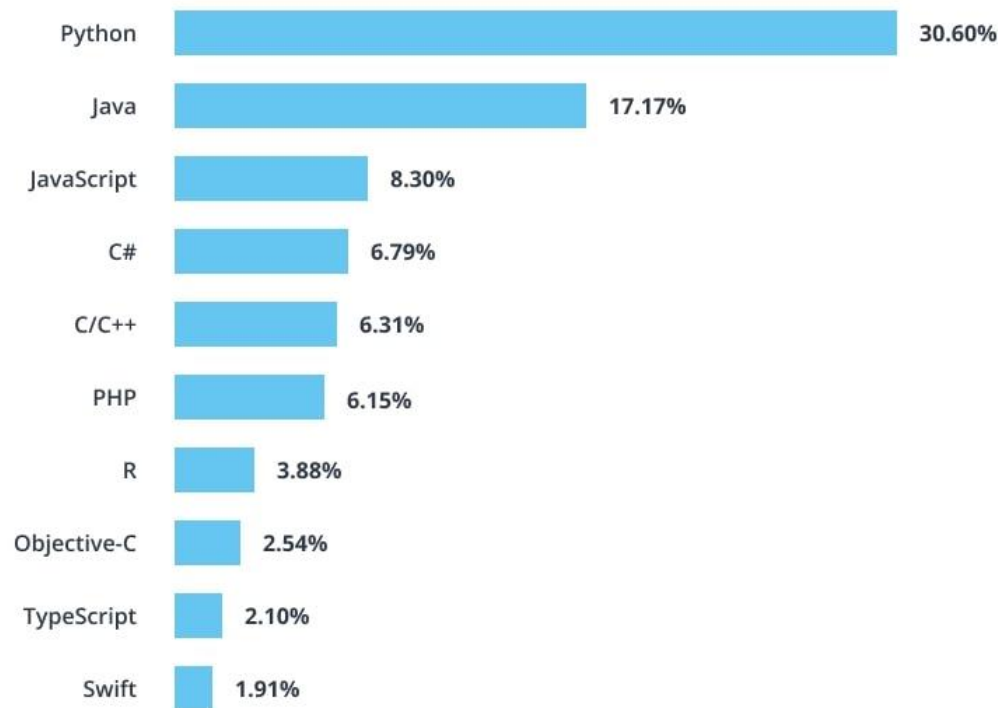
There are many Programming Languages in the world

Ada Assembly Basic C C++ C# Cobol
Cobra CODE ColdFusion Delphi Eiffel
Fortran FoxPro GPSS J# J++ Java
JavaScript LISP Logo LUA MEL Modula-2
Miranda Objective-C Perl PHP Prolog
Python Go Visual Basic Swift

Programming Language

Python:

The most popular programming language



Programming Language

...

What programming language is mostly used in the area of AI? Why?



GPT-3.5-Turbo

Poe

...

Python is the programming language that is predominantly used in the field of AI. There are several reasons for this:

1. **Simplicity and Readability:** Python is known for its simplicity and readability. Its syntax is clear and concise, making it easier for developers to write and maintain code.
2. **Rich Ecosystem:** Python has a vast ecosystem of libraries and frameworks that are specifically designed for machine learning and AI, such as TensorFlow, PyTorch, and scikit-learn. These libraries provide tools for tasks like data manipulation, mathematical operations, and model building.
3. **Community Support:** Python has a large and active community of developers. This means that there are plenty of resources, tutorials, and forums available for AI practitioners to seek help and share knowledge.
4. **Flexibility:** Python is a versatile language that can be used for a wide range of applications beyond AI. This flexibility makes it a popular choice for developers who work on diverse projects.
5. **Performance:** While Python may not be the fastest language for certain tasks, its performance can be optimized using libraries like NumPy and by leveraging its integration with high-performance languages like C and C++.

Overall, Python's ease of use, extensive libraries, community support, and flexibility make it the preferred choice for AI and machine learning applications.

Programming Language

Almost all the open-sourced AI projects are built upon **Python**.

For example:

1. Segment Anything

- <https://segment-anything.com/demo>

2. Stable Diffusion

- <https://huggingface.co/spaces/stabilityai/stable-diffusion-3-medium>

3. Music Generation

- <https://musicgeneratorai.com/>

4. Pose Estimation

- <https://saiwa.ai/app/detection/pose-estimation-1/>

Average Python Developer Salaries

Switzerland	\$133,000
The USA	\$127,000
Denmark	\$81,800
Israel	\$71,000
Norway	\$62,000
Czech	\$34,122
Poland	\$21,552
Hungary	\$16,771
Ukraine	\$15,906



Look for more practice?

- They are plenty of online programming resources, but you need to choose the one suitable for this course.
- <https://www.geeksforgeeks.org/python-exercises-practice-questions-and-solutions/?ref=shm>
- <https://www.placementpreparation.io/mcq/python/>
- <https://pynative.com/python-exercises-with-solutions/>
- <https://www.w3resource.com/python-exercises/>
- <https://pynative.com/python-basic-exercise-for-beginners/>
- Or ask ChatGPT to create some programming questions for you.