EEE110 - Computer Programming (Python)
Week 1: Course Introduction and Scope

ADANA ALPARSLAN TÜRKEŞ
SCIENCE AND TECHNOLOGY UNIVERSITY

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Department of Electrical and Electronic Engineering

Spring 2025

Outline

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Course Instructor

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Research Interests

- Electric Load Forecasting, Energy Analytics and Informatics, Renewable Energy, Distributed Generation, Electrical Energy and Power Systems, and Machine Learning.

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- Control Theory and Machine Learning

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Laboratory Assistant

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Research Interests

- Deep Learning and Speech Processing

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Course Information

Course Title	Code	Semester	T+L (Hours)	Credits	ECTS
Computer Programming	EEE110	2	3+2	4	6

Table 1: Table of Course Information

- Prerequisites: None
- Language: English
- Level: Bachelor
- Type: Compulsory

Course Assessment and Evaluation

Assessment Type	Quantity	Weight
Midterm Examinations	2	60%
Capstone Project	1	40%

Table 2: Table of Course Assessment and Evaluation

	Course Type	Allowed Rate	Allowed Hours
Absentee Rate	Main Course	30%	13
	Laboratory	20%	6

Table 3: Table of Absentee Rate

Laboratory Schedule

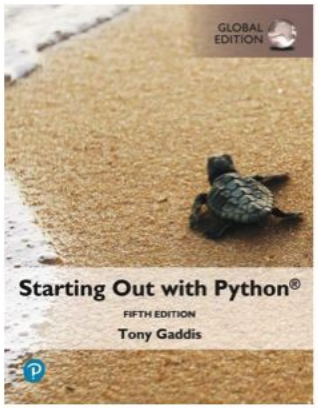
	Lab Contents
W2	Introduction to the Laboratory, Introduction to Anaconda Introduction to Python Programming Language
W3	Decision Structures & Boolean Logic, Repetition Structures
W4	Functions
W5	Files and Exceptions & Lists and Tuples
W6	Strings & Dictionaries and Sets
W8	Classes and Object-Oriented Programming
W9	Inheritance, Polymorphism, and Recursion
W10	Array-Oriented Programming with Numerical Python (NumPy)
W11	Introduction to Python Data Analysis (Pandas)
W13	GUI Programming (Tkinter)

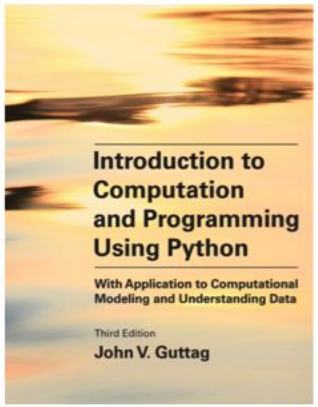
Learning Outcomes

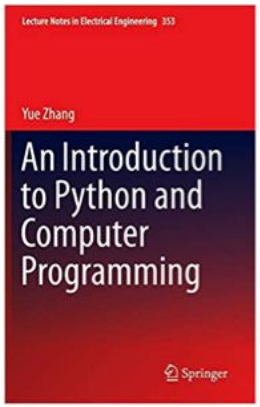
- Understand Python basics and use it for procedural, array-oriented, object-oriented, and GUI programming
- Able to manipulate a variety of Python data types
- Able to detect and fix common errors in Python programs
- Able to write small-scale computer programs via Python

Recommended Sources

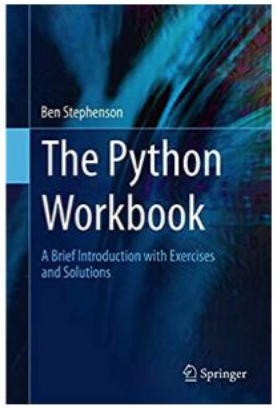
Textbooks [1, 2, 3, 4]

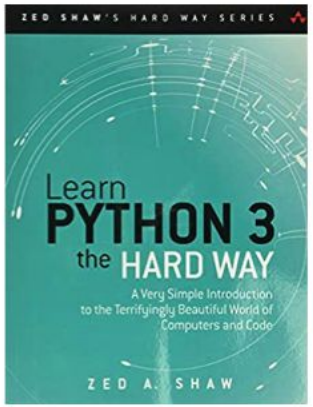


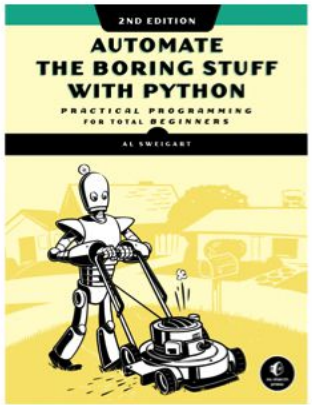


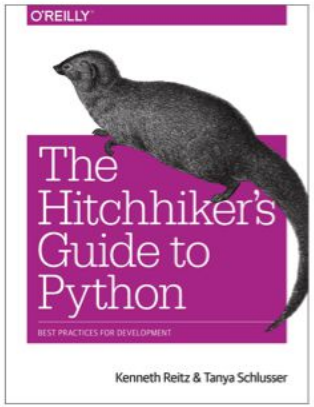


Additional Resources [5, 6, 7, 8, 9]









Outline

Course Contents – Week 2

Introduction to Computers and Programming

Rank	Language	Web[1]	Mobile[2]	Enterprise[3]	Embedded[4]	Score
1	Python	X		X	X	100.0
2	Java	X	X	X		95.4
3	C		X	X	X	94.7
4	C++		X	X	X	92.4
5	Javascript	X				88.1
6	C#	X	X	X	X	82.4
7	R			X		81.7
8	Go	X		X		77.7
9	HTML	X				75.4
10	Swift		X	X		70.4

[1]Web: Languages used for developing web sites and applications
[2]Mobile: Languages used for applications on mobile devices
[3]Enterprise: Languages used for enterprise, desktop, and scientific applications
[4]Embedded: Languages used to program device controllers

Table 4: IEEE Spectrum Top Programming Languages [10]

Course Contents – Week 2

Introduction to Python Programming Language

- JupyterLab
- Jupyter Notebook
- MS Visual Studio
- Spyder
- PyCharm
- Google Colab

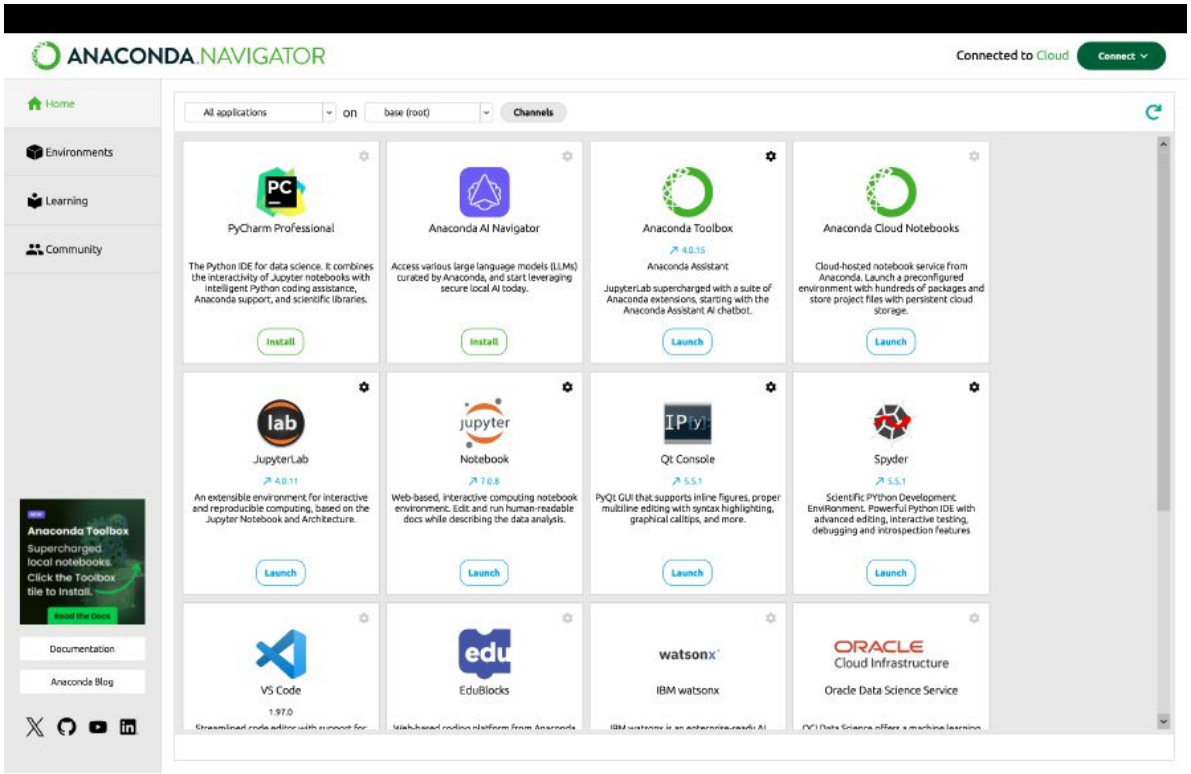


Figure 1: Anaconda Distribution for Python

Outline

Course Contents – Week 3

Decision Structures and Boolean Logic

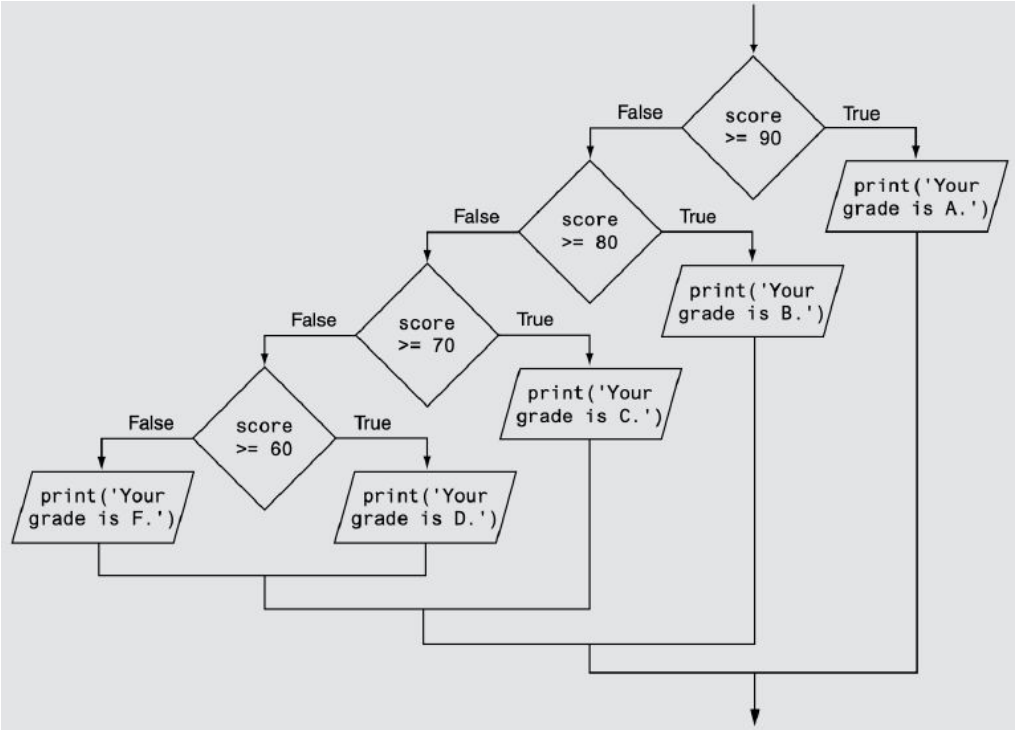


Figure 2: Demonstration of a decision structure example [1]

Course Contents – Week 3

Repetition Structures

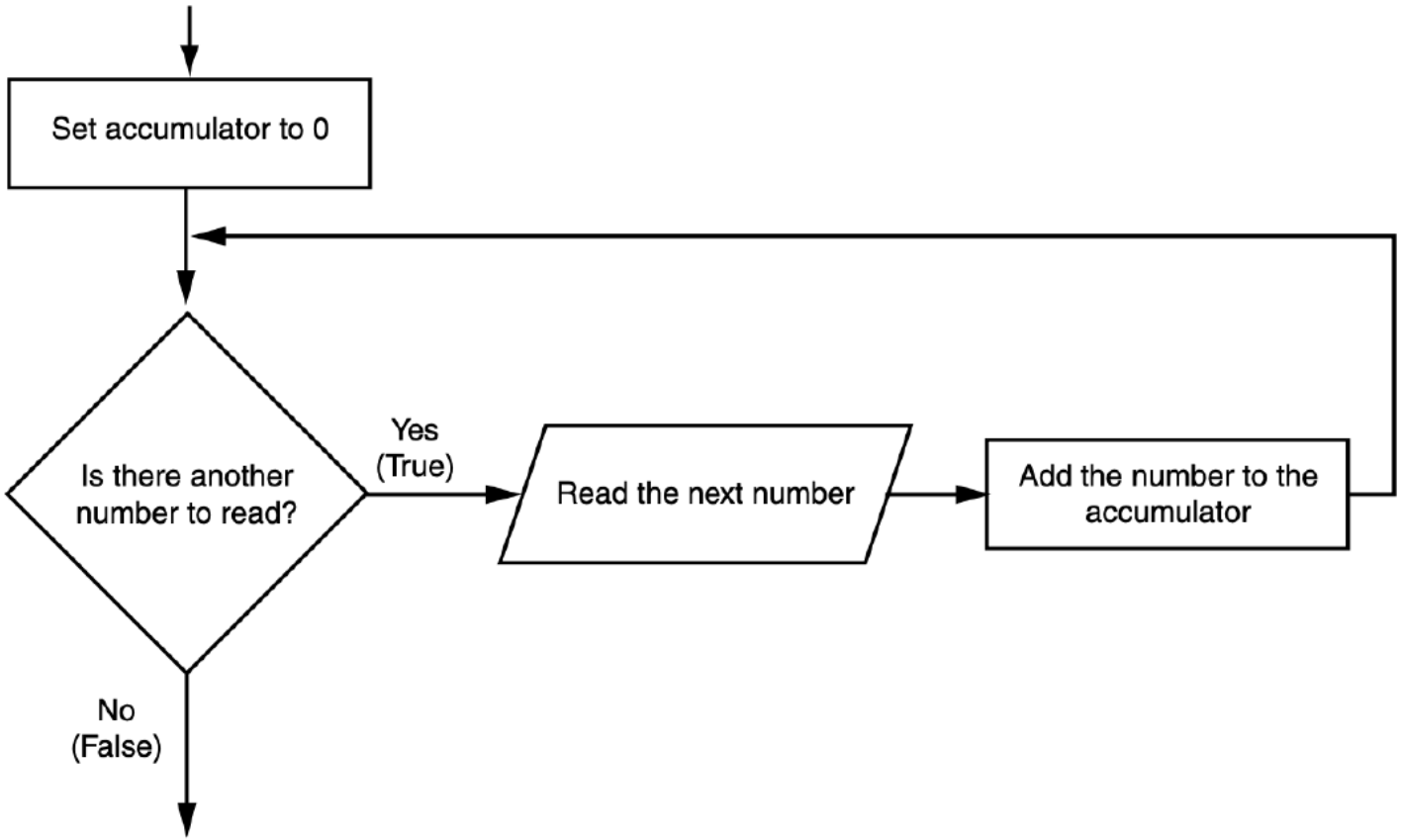


Figure 3: Illustration of a repetition structure example [1]

Outline

Course Contents – Week 4

Functions

These statements cause the message function to be created.

```
# This program demonstrates a function.
# First, we define a function named message.
def message():
    print('I an Arthur,')
    print('King of the Britons.')

# Call the message function.
message()
```

This statement calls the message function, causing it to execute.

Figure 4: Demonstration of a function example [1]

Outline

Course Contents – Week 5

Files and Exceptions, Lists and Tuples, & Introduction to Plotting

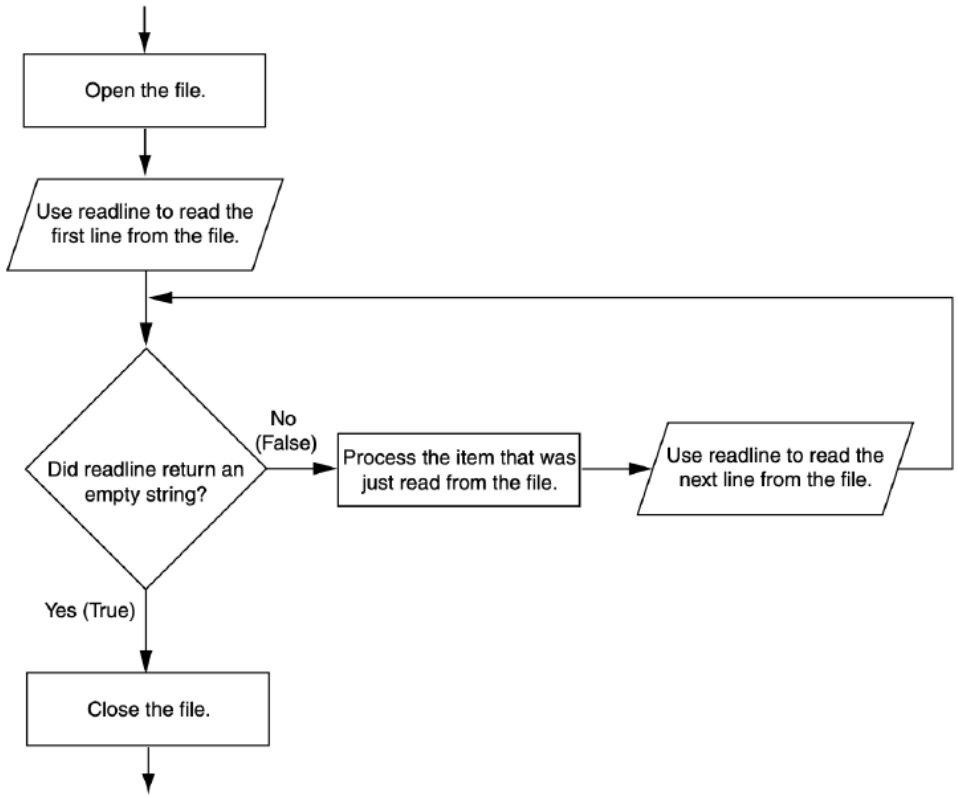


Figure 5: Flowchart of a file process [1]

Outline

Course Contents – Week 6

Strings & Dictionaries and Sets

```
>>> name = 'Kelly' Enter          # name is 'Kelly'
>>> name += ' ' Enter             # name is 'Kelly '
>>> name += 'Yvonne' Enter        # name is 'Kelly Yvonne'
>>> name += ' ' Enter             # name is 'Kelly Yvonne '
>>> name += 'Smith' Enter         # name is 'Kelly Yvonne Smith'
>>> print(name) Enter
Kelly Yvonne Smith
>>>
```

Figure 6: An example of string concatenation [1]

Outline

Course Contents – Week 7

Midterm Examination (Paper-Based)

#	Difficulty	Minutes	Pts	Scope
Q1	Very Easy	5	10	W1–W3
Q2	Easy	10	20	W3–W5
Q3	Moderate	30	30	W6–W8
Q4	Hard	45	40	W6–W8
Total		90	100	W1–W8

Table 5: An Example of Midterm Examination Assessment

Outline

Course Contents – Week 8

Classes and Object-Oriented Programming

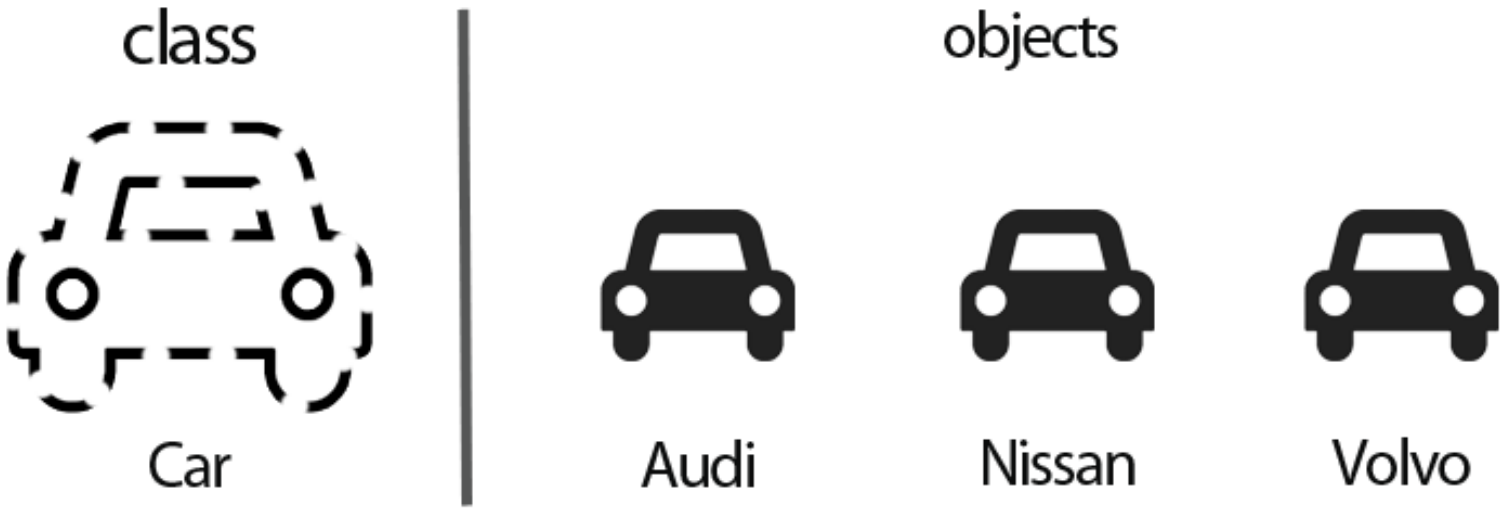


Figure 7: Demonstration of objects and classes [11]

Outline

Course Contents – Week 9

Inheritance, Polymorphism, and Recursion [1]

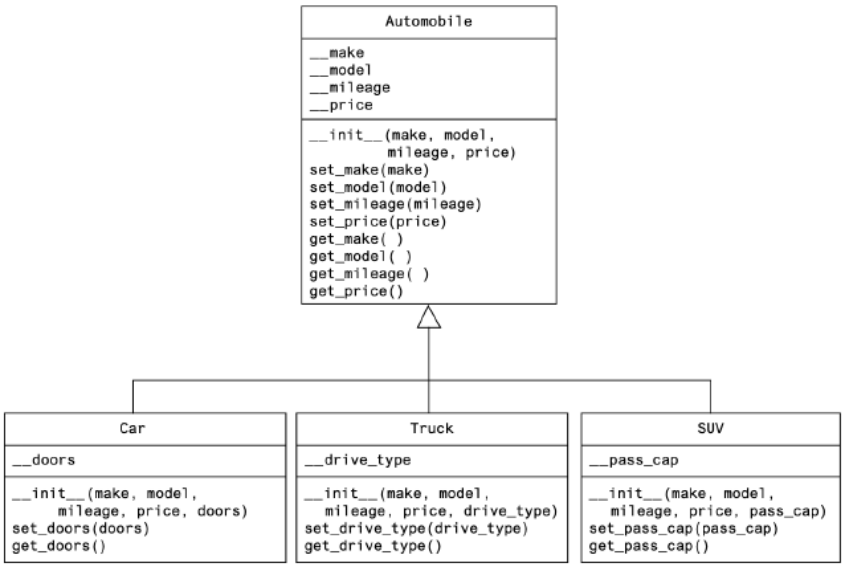


Figure 8: Inheritance

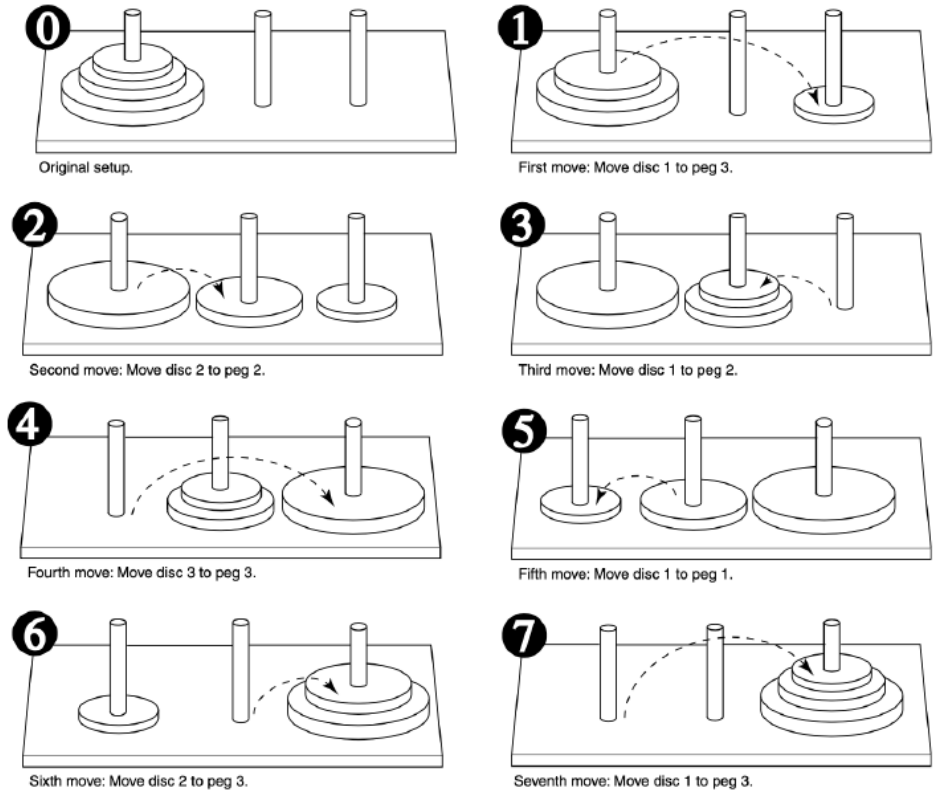


Figure 9: Recursion

Outline

Course Contents – Week 10

Array-Oriented Programming with NumPy

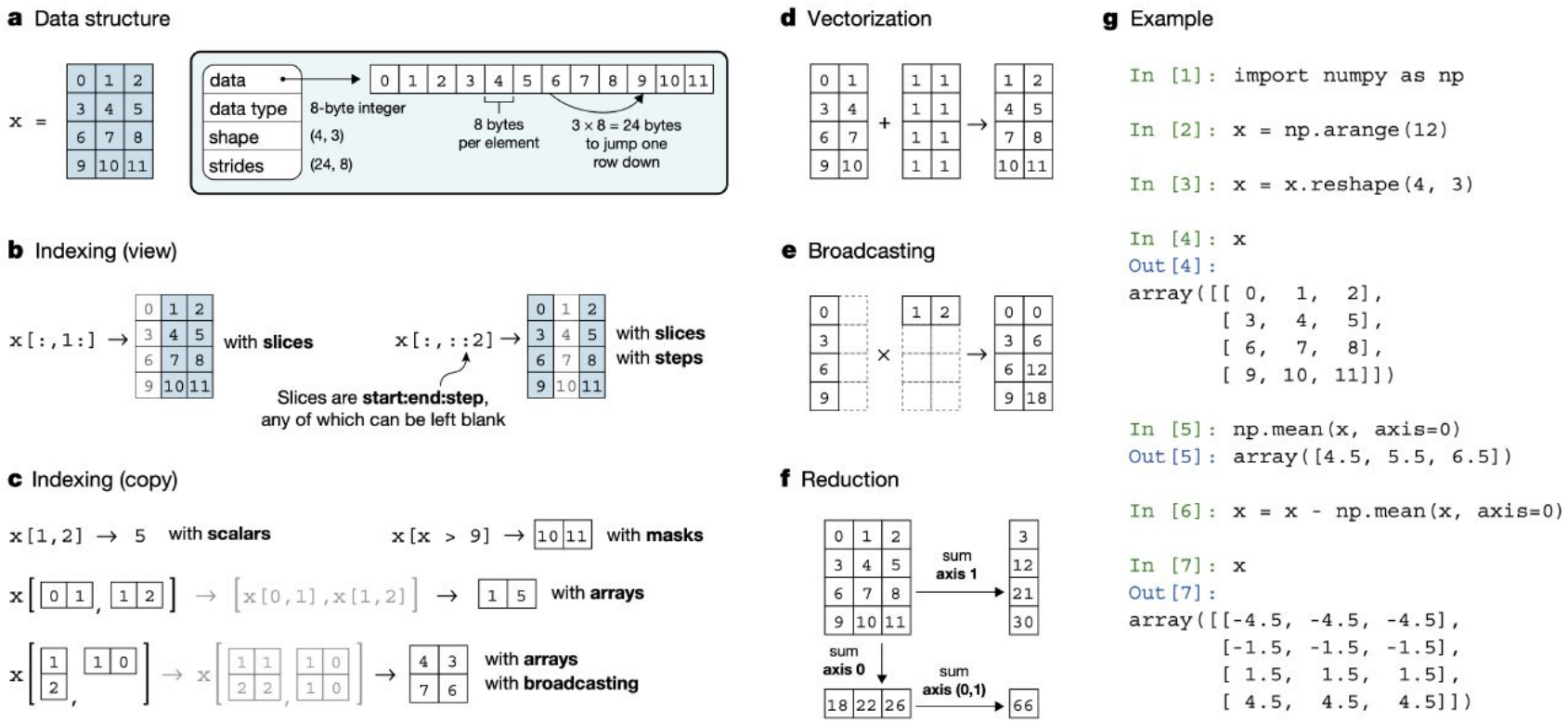


Figure 10: Several fundamental array concepts [12]

Outline

Course Contents – Week 11

Introduction to Python Data Analysis (Pandas) [13]

Outline

Course Contents – Week 12

Midterm Examination 2 (Paper-Based)

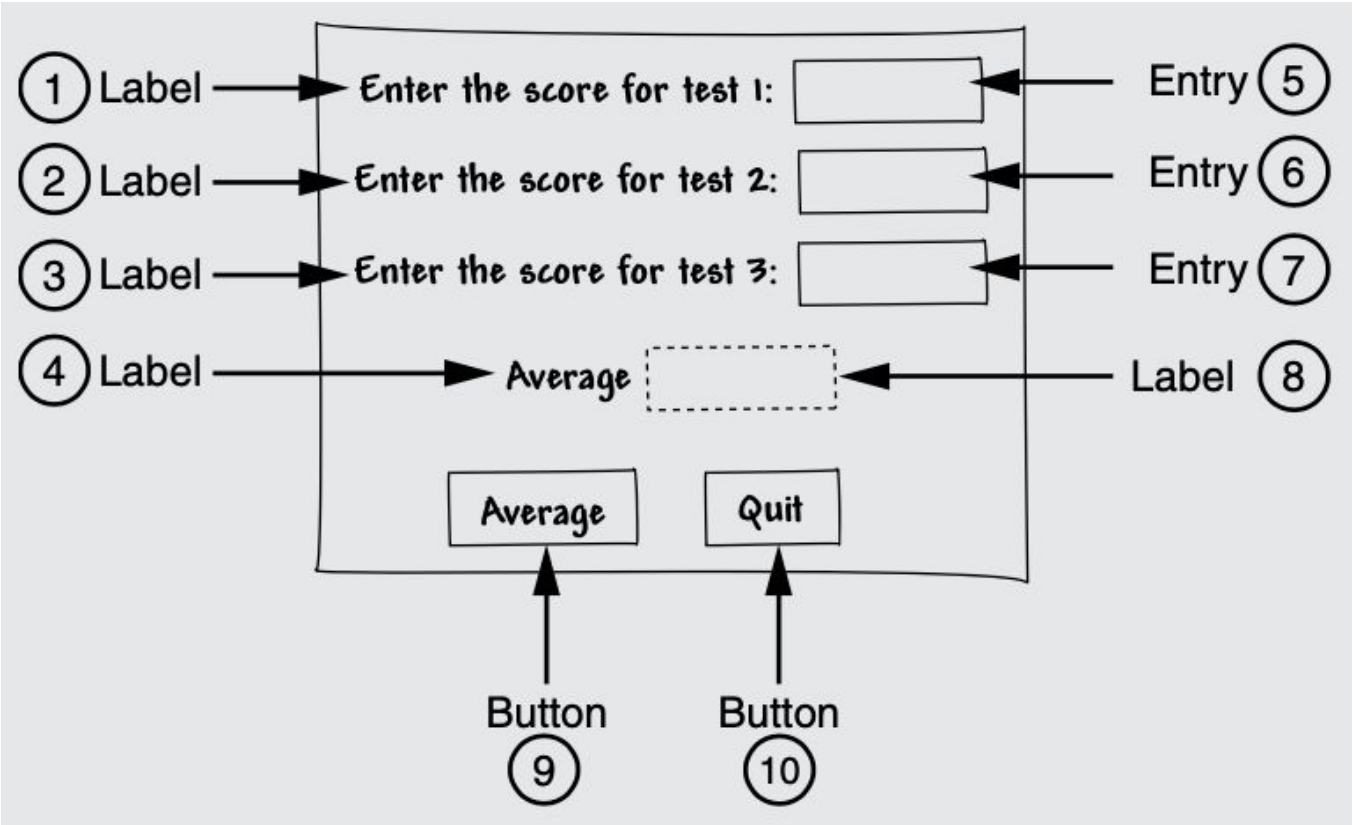
#	Difficulty	Minutes	Pts	Scope
Q1	Very Easy	5	10	W8–W11
Q2	Easy	10	20	W8–W11
Q3	Moderate	30	30	W9–W11
Q4	Hard	45	40	W10–W11
Total		90	100	W1–W11

Table 6: An Example of Midterm Examination 2 Assessment

Outline

Course Contents – Week 13

GUI Programming [1]



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Course Contents - Capstone Project - Week 14 and 15

A Capstone Project is

- an academic work
- in Jupyter IPython Notebook format
- which the instructors assess and evaluate
- how well a student understands the entire course.

Deadlines:

- Proposal Deadline: 17:00 on March 28, 2025
- Project Deadline: 17:00 on June 13, 2025

References I

[1] Tony Gaddis. *Starting Out with Python*. Pearson, 5th edition, 2022. ISBN 978-1-292-40863-7.

[2] John V. Guttag. *Introduction to Computation and Programming Using Python with Application to Computational Modeling and Understanding Data*. MIT Press, 3rd edition, 2021. ISBN 978-0-262-54236-4.

[3] Paul Deitel and Harvey Deitel. *Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data, and the Cloud*. Pearson Education, 1st edition, 2022. ISBN 978-1-292-36490-2.

[4] Yue Zhang. *An Introduction to Python and Computer Programming, Lecture Notes in Electrical Engineering*, volume 353. Springer, 2015. ISBN 978-981-287-608-9.

[5] Allan B. Downey. *Modeling and Simulation in Python*. 2017.

[6] Ben Stephenson. *The Python Workbook A Brief Introduction with Exercises and Solutions*. Springer, 1st edition, 2014. ISBN 978-3-319-14239-5.

References II

[7] Zed A. Shaw. *Learn Python 3 the Hard Way A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code*. Addison-Wesley, 1st edition, 2017. ISBN 978-0-13-469288-3.

[8] Al Sweigart. *Automate the Boring Stuff with Python Practical Programming for Total Beginners*. No Starch Press, 2nd edition, 2020. ISBN 978-1-59327-992-9.

[9] Kenneth Reitz and Tanya Schlusser. *The Hitchhiker's Guide to Python Best Practices for Development*. O'Reilly, 1st edition, 2016. ISBN 978-1-491-93317-6.

[10] IEEE Spectrum. The top programming languages 2021, 24th Aug, 2021. URL `https://spectrum.ieee.org/top-programming-languages-2021`.

[11] Java Tutorial Network. What is oop?, 2020. URL `https://javatutorial.net/wp-content/uploads/2014/11/class-object-featured-image.png`.

References III

[12] Charles R. Harris, K. Jarrod Millman, Stéfan J. van der Walt, Ralf Gommers, Pauli Virtanen, David Cournapeau, Eric Wieser, Julian Taylor, Sebastian Berg, Nathaniel J. Smith, Robert Kern, Matti Picus, Stephan Hoyer, Marten H. van Kerkwijk, Matthew Brett, Allan Haldane, Jaime Fernández del Río, Mark Wiebe, Pearu Peterson, Pierre Gérard-Marchant, Kevin Sheppard, Tyler Reddy, Warren Weckesser, Hameer Abbasi, Christoph Gohlke, and Travis E. Oliphant. Array programming with numpy. *Nature*, 585(7825):357–362, 2020. doi: 10.1038/s41586-020-2649-2. URL `https://doi.org/10.1038/s41586-020-2649-2`.

[13] commbox. How data, analysis, and reports can improve customer service, 2022. URL `https://www.commbox.io/how-data-analysis-and-reports-can-improve-customer-service/`.