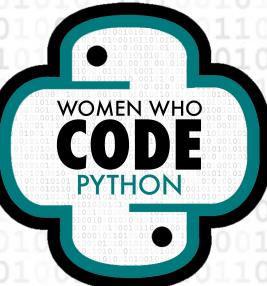


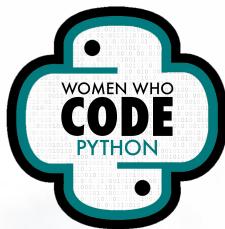
Welcome everyone!

- You can find these slides on GitHub here:
<https://github.com/WomenWhoCode/WWCodePython>
- Please make sure your chat is set to “All panelists and attendees”.
- Some housekeeping rules:
 - Everyone will be muted throughout the webinar, but there will be opportunities for participation!
 - Please share your thoughts on the chat and/or ask questions in the Q&A.
 - The entire team is here today. Please reach out to us with any technical questions!



WELCOME WOMEN WHO CODE





Women Who Code Python

**Intro to Data Structures
with Python:
Ace the Technical Interview**



Session #3: Arrays & Matrices



MEET YOUR TEAM



Rishika Singh

Track Lead



Jasmeen Rajpal

Evangelist

OUR MISSION

Inspiring women to
excel in technology
careers.

WOMEN WHO
CODE



OUR VISION

A world where women are representative as technical executives, founders, VCs, board members and software engineers.

WOMEN WHO
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OUR TARGET

Engineers with two or more years of experience looking for support and resources to strengthen their influence and levelup in their careers.



CODE OF CONDUCT

WWCode is an inclusive community, dedicated to providing an empowering experience for everyone who participates in or supports our community, regardless of gender, gender identity and expression, sexual orientation, ability, physical appearance, body size, race, ethnicity, age, religion, socioeconomic status, caste, creed, political affiliation, or preferred programming language(s).

Our events are intended to inspire women to excel in technology careers, and anyone who is there for this purpose is welcome. We do not tolerate harassment of members in any form. Our **Code of Conduct** applies to all WWCode events and online communities.

Read the full version and access our incident report form at womenwhocode.com/codeofconduct

230,000 Members

70 networks in 20 countries
Members in 97+ countries
10K+ events
\$1025 daily Conference tickets
\$2M Scholarships
Access to [jobs](#) + [resources](#)
Infinite connections



OUR MOVEMENT

As the world changes, we can be a connecting force that creates a sense of belonging while the world is being asked to isolate.



Upcoming Events

WED
31
MAR

📊 Databases with Python: Session on MongoDB 📊 *Featured*

6:00 PM – 7:00 PM (EDT) | 🔍 Zoom

[Register](#)

SAT
03
APR

🔥 Introduction to Deep Learning for Edge Devices Session 4: Hardware on the Edge 🔥 *Featured*

8:00 PM – 9:30 PM (EDT) | 🔍 Zoom

[Register](#)

THU
08
APR

🌟 Intro to Data Structures with Python: Ace the Technical Interview (Session #4): Stacks & Queues) 🌟 *Featured*

8:00 PM – 9:30 PM (EDT) | 🔍 Zoom

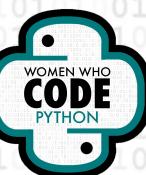
[Register](#)

SAT
17
APR

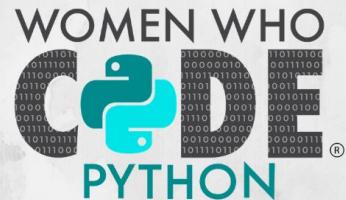
🔥 Introduction to Deep Learning for Edge Devices Session 5: Pruning 🔥 *Featured*

8:00 PM – 9:30 PM (EDT) | 🔍 Zoom

[Register](#)



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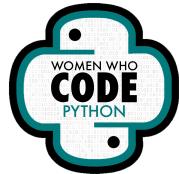
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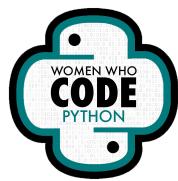
WOMENWHOCODE.COM/PYTHON



Yashika Sharma

Team Lead at MLH | WWCode Track Lead



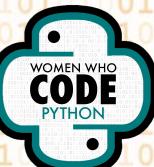


Today's Agenda

1. What is an array?
2. Difference between Vectors and Arrays
3. Numpy vs In-built Lists
4. Array Methods

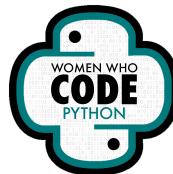


Vectors and Arrays



Recap from Session #2 : Lists

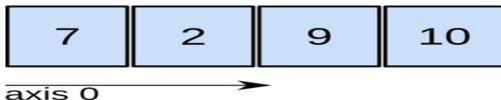
- An ordered collection of elements
- Data are stored within bracket
- Very flexible because
 - Different data types can be stored in the same list
 - Mutable - can be edited after they create
- E.g. movielist = ["Titanic", "Ocean 8", 2012]



Vectors vs. Arrays

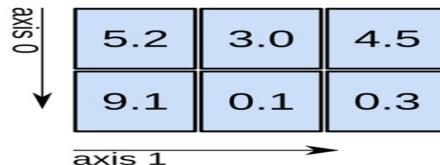
Vectors are one dimensional arrays and arrays can be multi-dimensional i.e. having more than one rows and columns.

1D array



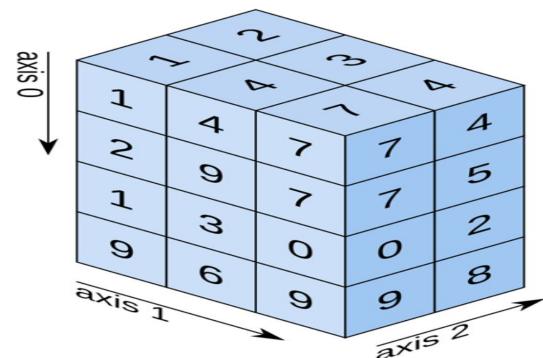
shape: (4,)

2D array



shape: (2, 3)

3D array

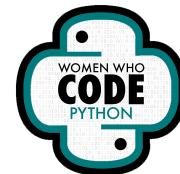
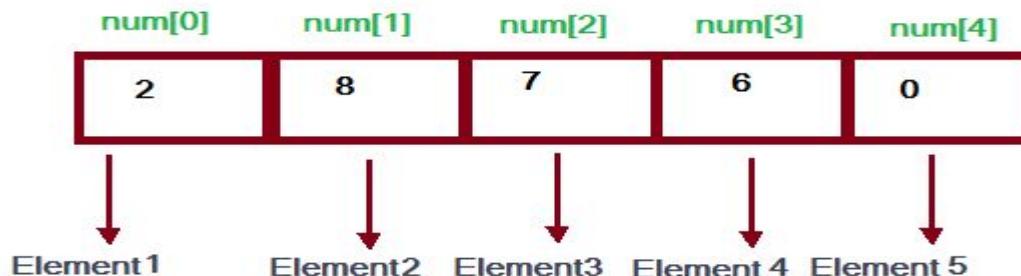


shape: (4, 3, 2)



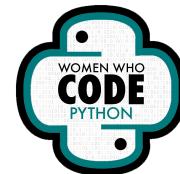
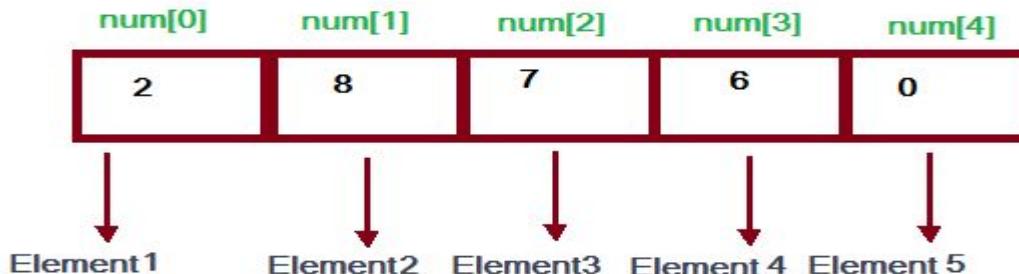
What is an Array?

- An array is a special variable, which can hold more than one value at a time
- Imagine it as a grid with multiple rows and columns with values in each box
- Elements are accessible using the position/index in the array



Indexing Of Arrays

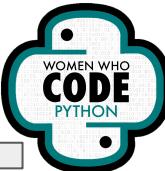
- Indexing starts from 0. In the below example, first element in the array is accessible using num[0].
- To access last element in Python's list : num[:-1]
- Tip: Reverse the list -> num[::-1]



Slicing Of Arrays

Slicing is indexing syntax that extracts a portion from a list. If a is a list, then $a[m:n]$ returns the portion of a :

- Starting with position m
- Up to but not including n
- Negative indexing can also be used

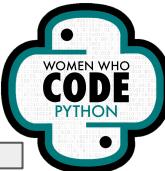


Slicing Of Arrays

```
array = ["Hi", "this", "is", "session", "3"]
```

- Omitting the first index `a[:n]` starts the slice at the beginning of the list. Where `n` is not inclusive.

```
array[:2] -> ["Hi", "this"]
```

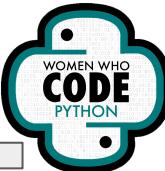


Slicing Of Arrays

```
array = ["Hi", "this", "is", "session", "3"]
```

- Omitting the last index `a[m:]` extends the slice from the first index `m` to the end of the list.
Where `m` is inclusive.

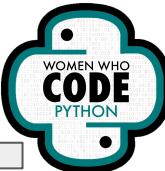
```
array[2: ] -> ["is", "session", "3"]
```



Slicing Of Arrays

```
array = ["Hi", "this", "is", "session", "3"]
```

- Using two indices to slice the array:
array[1:3] -> ["this", "is"]
- Using array[:], we will get the copy of entire original list `array`.

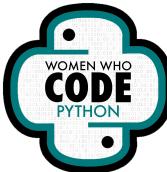


Arrays in Python

In Python, we can use arrays in two ways:

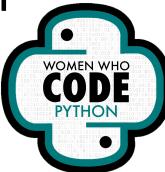
- Using the built-in data structure : ***List***
- Importing external library : ***NumPy***

NumPy arrays facilitate advanced mathematical and other types of operations on large numbers of data. Typically, such operations are executed more efficiently and with less code than is possible using Python's built-in lists.



NumPy

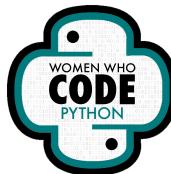
- To use it, we have to import it.
import numpy as np
- Create a N-dimensional array in python using
numpy.array()
- NumPy arrays are homogeneous meaning it can
only store same type of data unlike list. But
dtype=object can be used for different data
types.
- Most importantly, NumPy supports vectorization



When to use what?

Although NumPy is more efficient and speedy as compared to Python's built-in lists(arrays), in the interviews you'd end up using the latter most of the times.

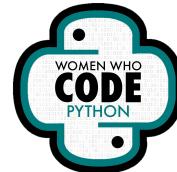
In Python even stacks and queues can be implemented using lists.



Array Method

Some useful methods array=[2,3,6,7,3]

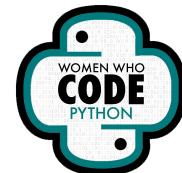
Method	What it does?	Example
append()	Adds an element at the end of the list	array.append(5)
pop()	Removes the element at the specified position	array.pop()
reverse()	Reverses the order of the list	array.sort(reverse=True)
index()	Returns the index of the first element with specified value	array.index(2)
count()	Returns number of elements with specified value	array.count(3)



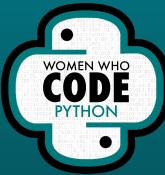
Some interview topics related to Arrays

- Sorting
- Searching
- Stacks
- Heaps
- Dynamic Programming

	G	A	A	T	T	C	A	G	T	T	A
G	0	0	0	0	0	0	0	0	0	0	0
G	0	1	1	1	1	1	1	1	1	1	1
G	0	1	1	1	1	1	1	1	2	2	2
A	0	1	2	2	2	2	2	2	2	2	3
T	0	1	2	2	3	3	3	3	3	3	3
C	0	1	2	2	3	3	3	4	4	4	4
G	0	1	2	2	3	3	3	4	4	5	5
A	0	1	2	3	3	3	4	5	5	5	6

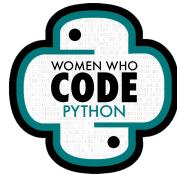


Q&A Time!



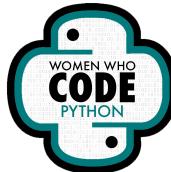


Karen Wong
Programmer | Python Track Lead



Time for Live Coding!

<https://colab.research.google.com/drive/163WyY2sr8UndN3MVpmhlVAhfVuHnyi4n?usp=sharing>



Next Session!

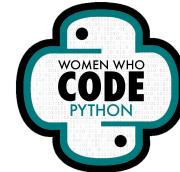
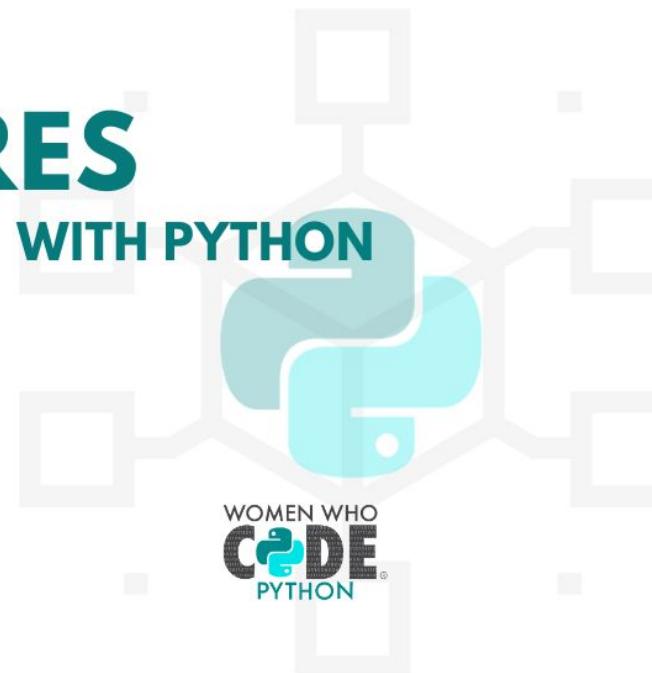
INTRO TO

DATA STRUCTURES

WITH PYTHON

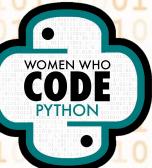
ACE THE
TECHNICAL
INTERVIEW

THU. APRIL 8TH
@ 8:00PM EDT



Questions?

Join our Slack channel:
#intro-data-structures-stdy-grp



Thank You!

