

CS 196 Notes

Python Part 1:

- Python is an interpreted, object-oriented, high-level programming language with dynamic semantics
- Interpreted languages run by an interpreter which reads the code line by line
- Object Oriented: A programming paradigm centered around the idea of using objects
- Objects are abstract data types that are used instead of traditional lines and lines of code and data
- Pythonic code is simply a design choice to produce highly readable Python code
- If you can write less while maintaining readability, do that
- Variables help us store stuff in our programs
- Different data types include: integers, floats, strings, booleans
- The None Type: None is not the same as 0, False, or an empty string. None is a datatype of its own (NoneType) and only None can be None.
- None in python is like the null in java
- Operators:
 - Is - checks if referencing the same object
 - In - checks if value within another object
- elif is syntax in python for else if
- Loops allow us to repeatedly run the same section of code
- for variable in range(some_range):
- for i in range(10) - this will print numbers from 0 to 9
- for i in range(2, 10) - will print numbers from 2 to 9, including 9
- We can add a third parameter to add a step
- for i in range(2, 10, 2) - will print numbers from 2 to 9 taking steps of two
- for value in data_structure
 - x = [1, 9, 6]
 - for val in x:
- while some_statement is true:
- If we are in a loop but we want to leave it early, we can use the break keyword
- def function_name(arguments):
- Lists are a collection which is ordered and changeable
- Duplicate values are allowed

- List != Arrays - lists are resizable
- To get the length of an array, you would use the len() function
- Lists in python are simply array of bytes
- x.pop() returns the first element in the list and deletes it from the list
- x.reverse() reverses the list
- x.sort() sorts the array using the time sort algorithm
- When an exception occurs in Python, it will stop running and send us an error message
- Use exception handling we can handle exceptions without crashing the program
- To do this, we use: try - except (-finally) commands
- If an exception occurs in the try block, Python catches the exception and moves onto the except block and runs the code in there
- Try-except on the other hand has very minimal cost if no exception occurs however if an exception occurs it is very expensive

Python 2:

- List Comprehensions: Allows you to create new lists from other lists
- squares = [n ** 2 for n in nums]
 - Outputting a square for number 'n' in the nums array
- Enumerate allows u to order indices to a list
- list(enumerate(list_name))
- Sets:
 - Unordered and Unindexed
 - Each value is unique
 - Very fast when used as a 'lookup table'
 - Has functions to get what you'd see in 'Math sets'
 - ◆ Union
 - ◆ Intersection
- Dictionaries:
 - In a List, we access elements by referencing indices
 - In a Dictionary, we access elements by referencing Keys
 - Key:Value Pairs
 - Very fast when used as a 'lookup table'

APIs, Libraries, Frameworks:

Django Part 1:

- Web frameworks are software frameworks that we use to help us make web applications like
 - Web Services

- Web Resources
- Web API's
- Why use Django?
 - Security - Popular frameworks have the benefit of large communities which can quickly find bugs
 - Efficiency - You can rapidly develop applications by utilizing ready-made functionality within the framework instead of rewriting hundreds of lines of code
 - URL Mapping - It's very easy to index multiple pages and make them easily accessible
 - Cheap - The most popular frameworks are free and you can develop faster. Time == Money
 - Large Community Support - Extensive documentation, support team, community forums, etc. provides load of supports that makes learning super easy
- What is a Model View Controller (MVC)
 - It is a software design pattern used for developing user interfaces
 - The program logic is split into the tree interconnected elements
 - This level of abstraction is done to separate the backend from what is used by the user