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Python Data Structures

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CS420-T301 Data Structures

6/9/2024

It is important to understand the built-in data structures in Python and how they can be used in algorithmic design and problem-solving.  Python was released in 1991 as a language that is simple to use and beautiful to look at.  This language is easily readable, user-friendly, and beginner-friendly.  The name of Python came from the TV show “Monty Python’s Flying Circus.”  Python is a general-purpose language, which comes with many advantages such as being easy to read, open source, portability, extendibility, and has a broad standard library.  Python uses keywords over punctuation and line breaks are used to define code blocks.  The code for Python is able to be modified however you want because of it being open source.  Python is a cross-platform language and can be used on any operating system that has an interpreter for Python.  An interesting thing about Python is its ability to be written in other languages as well, and low-level modules can be added to the Python interpreter so that it can be customized and optimized.  Python also uses a library that is available to everyone and can be used to bypass the writing of code for every single function.  Through the years of learning different languages, I have chosen Python as my favorite language due to it being versatile.

            Python has built-in data structures, like lists, tuples, sets, and dictionaries.  Lists are defined with square brackets that store data, which are separated using commas.  Lists are mutable so you can order the list and use different data types within it.  Tuples are containers like lists, but they are immutable so that the elements in the list can’t be added, removed, or sorted.  Sets are mutable and used to quickly remove duplicates from a list.  Dictionaries are mutable and used to store a pair of items.  Containers are able to be included inside of other containers, which can be used to create compound data structures.  All of these built-in data structures are useful with storing and manipulating data sets.

            Earlier in the essay I have written about the advantages of Python and how the built-in data structures make it user-friendly and strong, however, there are also disadvantages.  The disadvantages included lower performance, global interpreter lock, large memory consumption, types of variables being changed at runtime due to it being dynamically typed, versioning issues due to how many libraries and packages there are, difficulties in reading and maintaining code due to Python’s flexibility, and Python can have a deep learning curve for people without experience in programming.  Python can be used to create GUI applications.  In the past I have used Python to create easy-to-use GUI applications to perform multiple different functions such as calculations.  Python is used by many different organizations, which include Google, Yahoo, YouTube, Mozilla, Dropbox, Microsoft, Cisco, Spotify, Quora, and Facebook.  There are many different IDEs that you can use when coding in Python.  My favorite IDEs I have used were Spyder and Visual Studio Code.  I’ve enjoyed the first assignment learning about Python and I’m excited to learn more about it.

Sources:

*Kouate, P. M. (2023, November 2). How do you use data structures and algorithms in Python? Built In.* [*https://builtin.com/data-science/data-structures-and-algorithms-in-python*](https://builtin.com/data-science/data-structures-and-algorithms-in-python)

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