

Bellevue University

# M1 Assignment

Timothy Jelinek

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## Part 1

The map function is used to apply a given function to lists, tuples, sets, or dictionaries. This will result in the function applying to each element inside of the list, tuple, set, or dictionary and returning the result map object. It is useful to perform operations of a data structure efficiently and can be used for multiple lists simultaneously. You can also get more concise code by using lambda functions with the map function. The map function also is more efficient in its use of memory as it retrieves individual items from memory when they are needed versus storing the entire list in the computer's memory.

When using the map function, it is important to recognize and avoid making common mistakes. One common mistake of using the map function is not converting the keys and values you are using to the appropriate data type. A second common mistake is not initializing the map correctly by not specifying the type of keys and values you are using in the map. In Python, there are different types of maps, and it is important to choose the best map for what you are trying to accomplish. Finally, it is important to use the correct methods needed for the map you chose. An example of using the correct method is using the get method instead of the indexing operator when using a hash map.

## Part 2

Bytecode has advantages and disadvantages. One advantage of bytecode is that it has portability. An example of this portability is how code in Java can be compiled and executed on multiple different platforms without recompilation. A second advantage

of bytecode is that it is an intermediary representation of high-level source code and low-level machine code. This intermediary representation allows for optimization during the compilation and allows efficient code execution. A disadvantage of bytecode is that it is slower than machine code and requires an extra layer of compilation during runtime. A second disadvantage of bytecode is that it is designed to be portable, but it may still be dependent on virtual machines or runtime environments.

Machine code is also popular and has its own advantages and disadvantages. An advantage of machine code is that it is optimized for the hardware of a computer because it is executed directly by the computer's CPU. Another advantage of machine code is that it does not require an additional layer of compilation, which means during the processes there is no overhead. Finally, another advantage of machine code is that it can be highly efficient when it is optimized specifically for the computer's CPU. A disadvantage of machine code is that it can be in binary or hexadecimal format which results in the lack of human readability. Another disadvantage of machine code is that it is hard to debug and maintain. A third disadvantage is that it has errors that can cause crashes, data corruption, and security vulnerabilities. Finally, another disadvantage is that you need to have extensive knowledge of the hardware architecture underneath for accurate coding.

Sources:

"Map Function in Python" Gupta, [https://datatrained.com/post/map-function-in-python/#:~:text=The%20map\(\)%20function%2C%20a,other%20portions%20of%20the%20code](https://datatrained.com/post/map-function-in-python/#:~:text=The%20map()%20function%2C%20a,other%20portions%20of%20the%20code). Accessed 3 December 2023.

"Bytecode vs Machine Code: Understanding the Differences" Shiksha Online, <https://www.shiksha.com/online-courses/articles/bytecode-vs-machine-code-understanding-the-differences/#:~:text=Bytecode%2C%20on%20the%20other%20hand,portable%20and%20easier%20to%20maintain>. Accessed 3 December 2023.