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Lab 11 Write Up

The data structure I used is a dictionary. This is because the course code would be a unique key and the value would be the created object. This is better than other data structures because I would only need to cycle over the course codes instead of all the course data. This is used to organize the transcript which is a collection of course objects. A data type I used were classes to organize the courses and transcripts. These classes were easy ways to create and manipulate data for different user's classes and transcripts. Most of my functions were just rewrites of data or returning methods in a class. But, for the undo and redo function I used two leaky stacks. These held the 10 most recent actions. This was to ensure not too much memory was allocated to storing all the user's changes, but they could still undo and redo the last few mistakes. The running time of a dictionary is $O(n)$ where the worst case scenario is cycling through all the keys of the dictionary. Dictionaries are better than other data structures because the data being cycled over is more concise than all other data involved. Stacks have a running time of $O(1)$ for adding and removing because we only want to work with the most recent insert or add to the top. I had considered using arrays for data collection where each bit of information would be stored in the same element of an array. Each class could be an embedded array within a larger transcript array. This would be a lot longer running time, though, due to having to cycle over all information or every class in a transcript. Other data structures such as priority queues and heaps were not useful due to necessary weights added to the structures that would not be relevant for our data sets.