Name: Cody Smith

CSE 212 Data Structure “Cheat Sheet”

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| Data Structure | Graphic | Purpose and Example | Time Complexity of Common Operations | |
|  |  |  | Insert | Access |
| Dynamic Array |  | To insert multiple values into one variable such as “powers[]”. Used to get some number, take them each to a certain power like 10^2, and return them under the same variable. Similar to that math application called khanacadamy.com. | At the beginning:  O(1)  At the end:  O(1) | Find by value:  O(1)  Find by index:  O(1) |
| Linked List (Doubly-linked) |  | For inserting information at the head, middle, or tail after the list has been created. If you were to ask the user for input and needed to know where it went you would use linked lists. Like a website that already gives you a certain number of colors and then askes you to insert some other colors on your own. | At the beginning:  O(1)  At the end:  O(1) | Find by value:  O(1)  Find by index:  O(1) |
| Stack |  | When a new thing comes into sight it is what gets done first. Then what it was previously working on gets done unless there’s another process that it sees in the certain one. I’d describe this as a method that calls other methods before that method gets completely done. It finishes with the methods that it calls before the original method gets finished. |  | The top:  O(1) |
| Queue |  | Used to make a line or a queue where the first one in is the first one out. There are many queues out there such as a DMV line. Whatever number of people are ahead of you that is the number of people that will have to leave before you are called up. |  | The front:  O(1) |
| Map |  | Uses a key and a value to store items in a dictionary. The key can hold two or more items but the value has to be one. Like the key could be ‘colors’ and the value could be ‘red’. Used anywhere you want two store two items in the same variable. |  |  |
| Balanced BST |  | Basically, a linked list but a little better. Has a parent node and then at most two child nodes to find things easier. But sometimes there is just one or zero child nodes. But always has a root node which is where it starts. Used for search engines. |  |  |