Stacks and Linked lists

Alejandra Hernandez

College of DuPage

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# Stacks and Linked Lists

**Stacks**

A Stack is a data structure that holds data. This data container uses a *last-in-first-out(*LIFO) method. This means that whatever is at the end of the list gets removed first. A stack can be implemented using an array or a linked-list.

**Linked Lists**

A Linked-list is a linear data structure with nodes that use pointers to hold the addresses of the next node. These nodes are not in the same block of memory, they are spaced out which is why pointers are required to keep track of where they are in memory.

**Real World Example**

Stacks are used all around us. Stacks are implemented in many programs that may require you to return to a previous state. For example, when online browsing, to return to the previous page you would most likely hit the return button in top left of your browser. This involves a stack method. The browser keeps track of the pages and adds them to the stack. Since the stack is LIFO, your previous page at the bottom, so when you hit return you are taken back to that same page. Any program that requires the user to keep track of processes in a LIFO manner could benefit from a stack algorithm. A linked list can be used to implement the stack example above with web browsers. While not necessary, it's the smarter option when it comes to memory usage.

**Conclusion**

Linked-lists can be used to implement data structures such as stack and queues. It's very beneficial in adding new data. Adding new data to a dynamic array is very tedious depending on much the array has to resize. A dynamic array can end up being quite inefficient. One major disadvantage of a linked-list would be index access. Since a linked-list is linear, the program would have to go pointer to pointer to find the data in the linked list. Depending on the problem, a programmer should be able to figure out which would be better to use depending on the situation they are dealt with.

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# References

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