S7 - Palindrome Checker

What is the module?: This module is for if a word is a palindrome (word reversed is the same word)

Why is a stack good for this?: Since stacks are in LIFO order (Last In, First Out), we can input letters of a word into a stack and when we pop all of the letters, they will pop out of the stack in reverse order, making it very good to find if a word would look the same in reverse order.

Why would an array be annoying?: An array would be set with a set amount of elements, so it already limits you in what words you can use. Also, it would take too much time and effort to change a word into a set of characters and print them in reverse order.

Map:

text = kayak –> [k, a, y, a, k]

pop() -> [k, a, y, a], reverse = k

pop() -> [k, a, y], reverse = ka

pop() -> [k, a], reverse = kay

pop() -> [k], reverse = kaya

pop() -> [], reverse = kayak

S8 - Function Call Stack Simulator

What is the module?: This module is to represent a simple function call stack

Why is a stack good for this?: Stack can be used to go into functions within functions, making it easier to keep track of which function we are currently in. We can also “return” functions by popping them and returning to the previous function.

Why would an array be annoying?: An array limits on how many items you can add. Also, it will be far more annoying to figure out which “function” we return to in an array since that requires knowing the specific “function”’s index.

Map:

“call” -> [Function1] | “call” -> [Function1, Function2] | “call” -> [Function1, Function2, Function3]

“return” -> [Function1, Function2] | “return” -> [Function1] | “return” -> []

S9 - Stack Of Plates

What is the module?: This module is to represent the limits given to specific stacks and in this case, the max amount of plates you can have.

Why is a stack good for this?: A stack can be good to keep track of how many elements you have pushed in. A stack is not necessary since we are just counting the amount of items in the stack while adding to the stack and making sure that it doesn’t reach more than the max.

Why would an array be annoying?: An array wouldn’t necessarily be annoying here since we are just adding to a collection and reading the size of said collection. However, the one thing that would be annoying is if the collection goes past its maximum. On stacks, we can say if it reaches the maximum, print a warning message, however, on arrays, we would have to add one more spot to the array for it to not give us an error.

Map:

Max = 10

[1] -> [1, 2] -> [1, 2, 3] -> [1, 2, 3, 4] -> [1, 2, 3, 4, 5] -> [1, 2, 3, 4, 5, 6] -> [1, 2, 3, 4, 5, 6, 7] ->

-> [1, 2, 3, 4, 5, 6, 7, 8] -> [1, 2, 3, 4, 5, 6, 7, 8, 9] -> [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] (Max Reached)