Richard Hayes Crowley

03/23/2021

CSC\_157\_Lab\_014\_QA

1. **Referring to the starter code for this application, what type of value will be returned by the execution of the following statement: print(s.isEmpty())**

The statement returns a bool (True or False)

1. **Referring to the starter code for this application, what is returned be returned by the execution of the following statement: print(s.peek())**

s.peek() turns the top element of the stack, or the last element pushed to the stack. In the starter code where the function is executed, that would be “james”… a Stack is a simple data structure that operates on ‘last-in, first-out’ (LIFO) principles. Peeking at the top of the stack would reveal its latest entry.

1. **Explain, in detail, how a push differs from a pop, in reference to stack operations.**

A “push” appends an item to the stack, and increments the “stack pointer” (an integer that is used to keep track of the position or index of the top of the stack). A “pop” does the opposite; removes an item from a stack (and typically returns it), and decrements the stack pointer.

1. **One example of a stack, from real - world applications, is a pile of books at your local bookstore. Provide five additional examples of stacks as observed in the real - world.**

I think an apt example of what a stack really is would require that the items in the collection operated on a first-in, last-out principle. In that case, a stack of bread at the supermarket would not be a stack in the strict data-structure definition, as grocery clerks will often rotate bread and other such perishables to make sure that the oldest items are on top, to better ensure that hey are sold before going stale.

Something in the real world that behaves more like a stack, would perhaps be the piles of junk mail that gets shoved into my letterbox at my apartment: Last in, first out. A stack of dinner plates in the kitchen also are stack-like, as it doesn’t matter what order the dishes are in as dishes do not go stale. Another last-in, first-out stack in the real world would also perhaps be a stack of resumes sent to a hiring manager on a deadline, as it doesn’t matter what order those resumes are in.

Stacks can be effective data structures when they are dealing with data, for example, when a user of a asset management system wants to see the previous locations of an asset they are tracking in a table, that user would likely want to have this table arranged by the asset’s last location, first (again, following the LIFO principle).

I guess, as a general rule of thumb, stacks can be found when it is desirable to have a first-in, last-out structure (for example, when we want to sort by time\_of\_push descending) or where it doesn’t matter what order the items are in.

1. **What have you learned from performing and coding this lab assignment?**

Learned a bit about stacks, what consitutes a stack, and when and where stacks are appropriate.