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CS-2810-002

Assignment #13

(10.1, 10.3, 10.8, 10.9 a,b, 10.18)

10.1) What are the defining characteristics of a stack? Data is accessed on a last in first out basis.

10.3) Identify (a)-(d)

a) PUSH R1

b) POP R0

c) PUSH R3

d) POP R7

10.8) The following operations are performed on a stack:

PUSH A, PUSH B, POP, PUSH C, PUSH D, POP, PUSH E, POP, POP, PUSH F

a) What does the stack contain after the PUSH F? AF

b) At which point does the stack contain the most elements? After PUSH J and PUSH K

c) Without removing the elements left on the stack from the previous operations, we perform: PUSH G, PUSH H, PUSH I, PUSH J, POP, PUSH K, POP, POP, POP, PUSH L, POP, POP, PUSH M

What does the stack contain now? AFM

10.9) The input stream of a stack is a list of all the elements we pushed onto the stack, in the order that we pushed them. The input stream from Exercise 10.8 was ABCDEFGHIJKLM

The output stream of a stack is a list of all the elements that are popped off the stack, in the order that they are popped off.

1. What is the output stream from Exercise 10.8? BECJKIHLG
2. If the input stream is ZYXWVUTSR, create a sequence of pushes and pops such that the output stream is YXVUWZSRT.

PUSH Z, PUSH Y, POP, PUSH X, POP, PUSH W, PUSH V, POP, PUSH U, POP, POP, POP, PUSH T, PUSH S, POP, PUSH R, POP, POP

10.18) Correct Figure 10.16 so that it will add two single-digit positive integers and produce a single-digit positive sum. Assume that the two hex digits being added together do in fact produce a single hex-digit sum.

Correct Code:

IN

LD R2, NegASCII

ADD R1, R0, R2

IN

ADD R3, R0, R2

ADD R0, R2, R3

LD R4, Pos-ASCII

ADD R0, R0, R4

OUT

HALT

PosASCII .FILL x0030

NegASCII .FILL x0030