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SMALL ASSIGNMENT 11

Discussion on a high level with your colleagues is encouraged. Make sure the work submitted is your own. When in doubt, ask a TA or the instructor. If you are not sure what constitutes academic dishonesty, please refer to the AISC web site: https://aisc.uci.edu/.

You can fill out your answers below in text, paste screenshots, and/or include images (make sure the image is right side up & legible).

This homework covers:

- Ch 8: Data Structures

AISC

Please initial here to indicate you understand UCI's Academic Integrity Policy and confirm that this is your own work you are submitting (this counts for points): CPZ

8.4

This question is asking us to write a function called peek that returns the value of top item on the stack without removing it. Thus, we wish to load the value, without adjusting the pointer. Overflow checking is unnecessary because we are not moving the stack pointer.

HW11.asm

```
1          .ORIGIN x3000
2          AND     R5, R5, #0  ; R5 = 0 => success
3          LD      R1, EMPTY
4          ADD     R2, R6, R1
5          BRz     fail        ; if R6 = x4000 => empty
6          LDR     R0, R6, #0  ; access value in stack
7
8  fail    ADD     R5, R5, #1  ; R5 = 1 => failure
9          .END
10 EMPTY   .FILL xC000         ; = -x4000
11
```

8.13

Augment the iterative solution for computing n factorial to include the zero case.

I have developed another case for when R0 = 0.

```
1  FACT    ST      R1, SAVE_Rl
2          ADD     R1, R0, #0
3          ADD     R0, R0, #-1
4          BRz     DONE
5          BRn     ZERO
6  AGAIN   MUL     R1, R1, R0
7          ADD     R0, R0, #-1
8          BRnp    AGAIN
9  DONE    ADD     R0, R1, #0
10         LD      R1, SAVE_R1
11 ZERO    ADD     R0, R0, #2  ;R0 = 1, final result
12         LD      R1, SAVE_R1
13         .END
14 SAVE_R1 .BLKW   1
```