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EE Quals Question 2005

Consider a STACK data structure. Each record on the stack has 3 fields:

* next: pointer to the next record, further down the stack
* prev: pointer to the previous record, up the stack
* val: an integer value

A global variable TOP points to a dummy record which is always at the very top of the stack. An empty stack has the dummy record only, with both pointers null.
If there is one element, top.next points to it.

(a) Write (pseudo-code) a procedure POP which returns the top value in the stack, and removes the record for that value.

(b) Write a procedure PUSH that adds a value X at the top of the stack. The procedure creates a new record.

(c) Write a procedure that deletes the last record from the stack (the one furthest away from TOP).