

6.823 Computer System Architecture  
**6.823 Stack ISA**

*Last Updated:*  
 9/22/2005 5:41 PM

In a stack architecture, all operations occur on top of the stack. Only push and pop access memory, and all other instructions remove their operands from the stack and replace them with the result.

The table below gives a subset of a simple stack-based instruction set for 6.823.

Example instruction	Meaning
PUSH A	push M[A] onto stack
POP A	pop stack and place popped value in M[A]
ADD	pop two values from the stack; ADD them; push result onto stack
SUB	pop two values from the stack; SUBtract top value from the 2nd; push result onto stack
MUL	pop two values from the stack; MULtiply them; push result onto stack
ZERO	zeroes out the value at top of stack
INC	pop value from top of stack; increments value by one push new value back on the stack
BEQZ <i>label</i>	pop value from stack; if it's zero, continue at <i>label</i> ; else, continue with next instruction
BNEZ <i>label</i>	pop value from stack; if it's not zero, continue at <i>label</i> ; else, continue with next instruction
GOTO <i>label</i>	Continue execution at location <i>label</i>

Table H2-1: The 6.823 Stack ISA