EE 213 Computer Organization and Assembly Language

Week # 7 Lecture # 15

27th Muharram ul Haram, 1440 A.H

8th October 2018

Minds open...

... Laptops closed

This presentation helps in delivering the lecture.
Take notes, interact and read text book to learn and gain knowledge.

Today's Topics

- Stack data structure
- Operations on Stack (Must see lecture slides Lecture # 15b)
  - Push
  - Pop
  - Top of Stack (ToS)
- Implementing Push and Pop with PUSH and POP instructions
- Procedures and Functions
  - C functions, call and return values, local variables, actual and formal parameters.
  - Assembly PROC – ENDP directive to define procedures
  - CALL instruction
  - Parameter passing using Registers or Stack

Procedures

Already covered.

Covered in Lab

queue.
FIFO

① PUSH EAX. 32bit
② PUSH AX. 16 bit.
③ PUSH [EAX]

POP
<< PUSH →

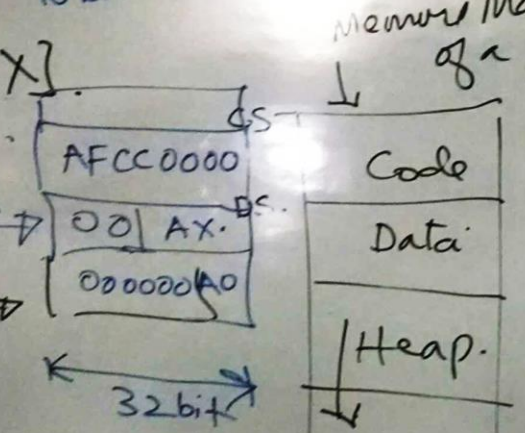
POP ECX
POP EBX
POP EX

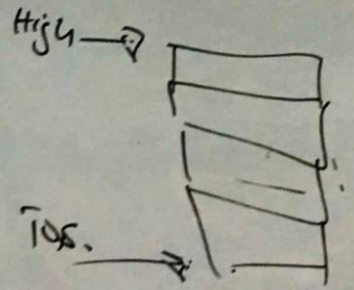
LIFO

1 PUSH an item on top stack. (ToS).

2 POP an item from top of stack

CALL



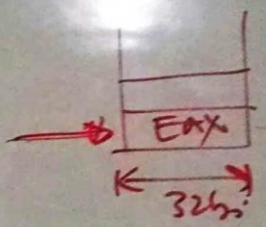


EAX

; PUSH EAX.
MOV [ESP], EAX ; MOV EAX → TOS.
ADD ESP, -4 ; update TOS.

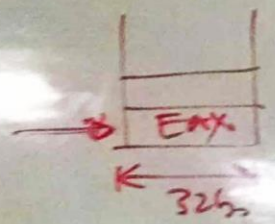
; POP EDX.
; ADD ESP, 4 ; Point TOS to next.
MOV EDX, [ESP].

PUSH TOP of Stack = TOS
POP TOS = TOP + 4.



TOS points to an Empty elem
" " " last push element.

PUSH! TOP of Stack = TOS − 4.
POP TOS = TOP + 4.



EAX

PUSH FD.
POP FD
PUSH AD
POP AD.
PUSHA
POPA

32 bits.

16 bits

POP
PUSH 1010h.

MOV EAX, F300H
PUSH EAX.
POP FD.

; PUSH EAX.
MOV [ESP], EAX ; MOV EAX → TOS.
ADD ESP, −4 ; update TOS.

; POP EDX.

; ADD ESP, 4 ; Point TOS to elem.
MOV EDX, [ESP].