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Practical 06

Shaw recursive function design doc

Inputs

- Integer value: User entered integer number from keyboard

Outputs

- Display message: Prompt message "Enter an integer: "

- Confirmation message: Output message "You entered: "

- Integer display: The same integer value displayed back to user

Variables

Inputs and Associated Types:

- temp0: DWORD

Outputs and Associated Types:

- strPrompt: BYTE array - String containing "Enter an integer: "

- strOutput: BYTE array - String containing "You entered:

- strNewline: BYTE array - String containing newline character

Linked to Basic Blocks:

- Input Block

- Processing Block

- Output Block

Algorithm

BEGIN Program

 // Setup Phase

 INITIALIZE stack frame

// Input Block

    strPrompt to user

    READ integer from keyboard INTO eax_register

    STORE eax_register INTO temp0

// Processing Block

  PREPARE output messages

// Output Block

    DISPLAY strOutput to user

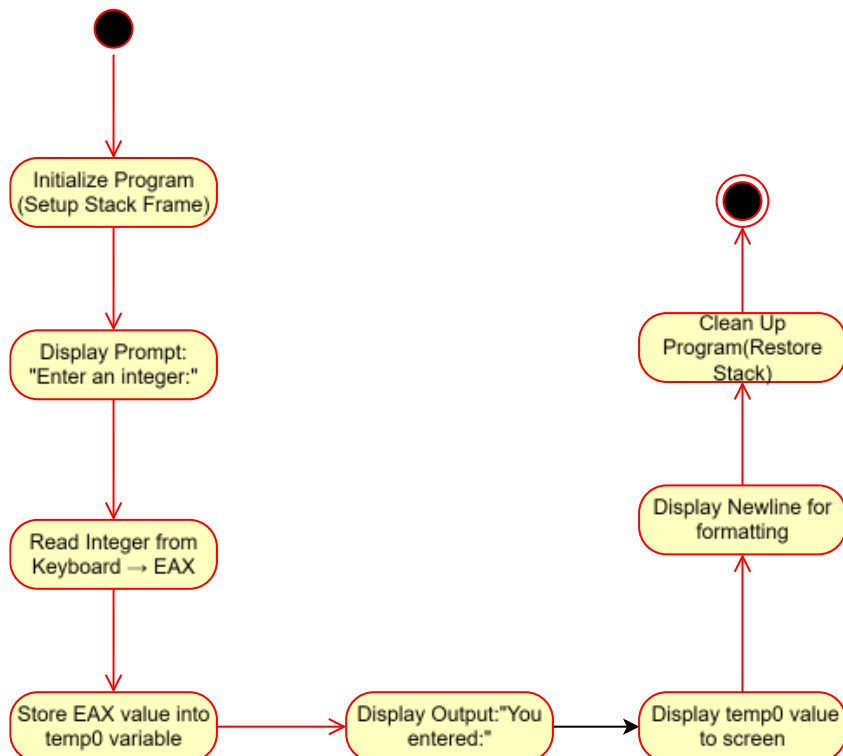   DISPLAY temp0 value to user

    DISPLAY strNewline for formatting

// Cleanup Phase

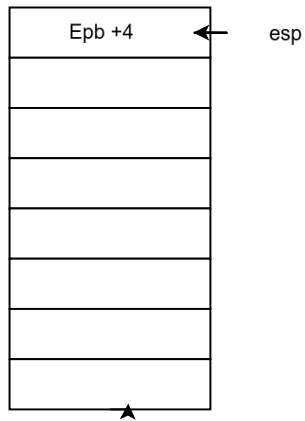   RESTORE stack frame
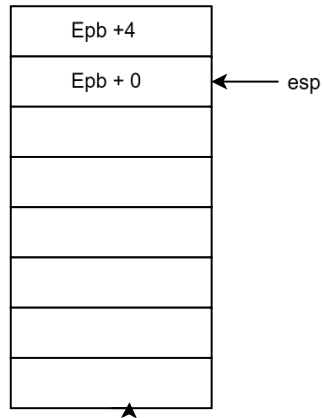
    TERMINATE program

END Program
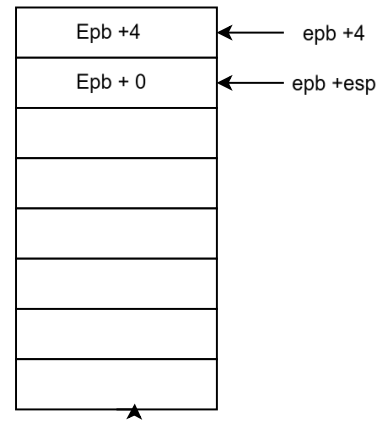

Activity Diagram
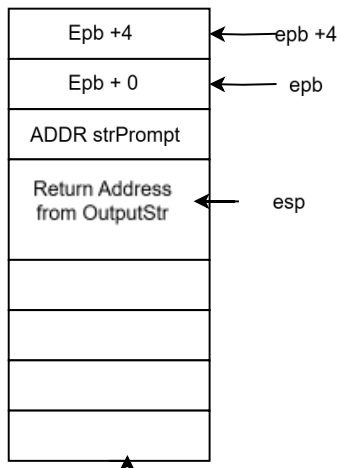
Stack Diagram

Before _start

Epb +4	← esp

2. After PUSH ebp (Save Base Pointer)

Epb +4	
Epb + 0	← esp

3. After MOV ebp, esp

Epb +4	← epb +4
Epb + 0	← epb +esp

4. During INVOKE OutputStr, ADDR strPrompt

Epb +4	← epb +4
Epb + 0	← epb
ADDR strPrompt	
Return Address from OutputStr	← esp

5. During INVOKE InputInt

Epb +4	← epb +4
Epb + 0	← epb
ADDR strPrompt	
Return Address from InputInt	← esp
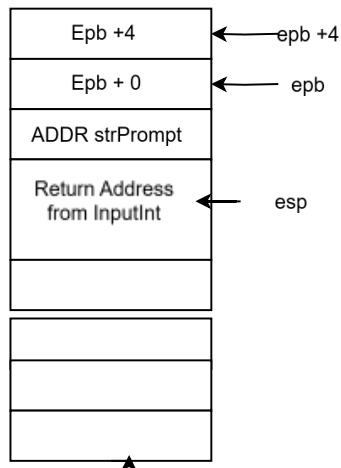
6. Back to Main Program

Epb +4	← epb +4
Epb + 0	← epb +esp
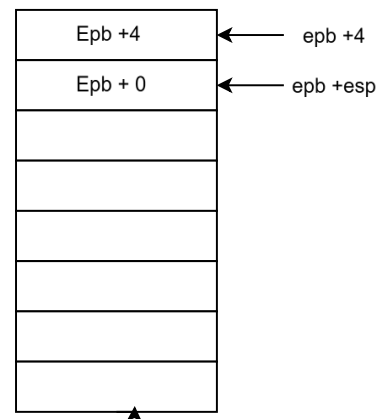
7. During INVOKE OutputInt, temp0

Epb +4	← epb +4
Epb + 0	← epb
temp0	
Return Address from OutputStr	← esp

8. After MOV esp, ebp

Epb +4	← epb +4
Epb + 0	← epb +esp

9. After POP ebp

Epb +4	← esp