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| Week | Reverse Engineering Malware | Duration |
| 4 | Procedures in Assembly Language | 120 mins |

Marks allocation: 8/100 for CA practical submission

**Lesson Objectives**

* Understand procedures in assembly language
* Write and execute assembly language programs using procedures

1. Which statement is true about what will happen when the example code runs?

1: main PROC

2: push 10

3: push 20

4: call Ex2Sub

5: pop eax

6: INVOKE ExitProcess,0 ; program ends

7: main ENDP

8:

9: Ex2Sub PROC

10: pop eax

11: ret

12: Ex2Sub ENDP

a. EAX will equal 10 on line 6

b. The program will halt with a runtime error on Line 10

c. EAX will equal 20 on line 6

**d. The program will halt with a runtime error on Line 11**

2. What values will be written to the array when the following code executes?

.data

array DWORD 4 DUP(0)

.code

main PROC

mov eax,10

mov esi,0

call proc\_1

add esi,4

add eax,10

mov array[esi],eax

INVOKE ExitProcess,0 ; program ends

main ENDP

proc\_1 PROC

call proc\_2

add esi,4

add eax,10

mov array[esi],eax

ret

proc\_1 ENDP

proc\_2 PROC

call proc\_3

add esi,4

add eax,10

mov array[esi],eax

ret

proc\_2 ENDP

proc\_3 PROC

mov array[esi],eax

ret

proc\_3 ENDP

**The array will contain 10, 20, 30, 40**

3. What a procedure in assembly language to calculate the area of rectangle.

To get the area of any rectangle, we have to multiply its length and width.

Area = Length \* Width

Assume that the l = 30 cm and w = 20 cm. Use appropriate 32 bit registers.

Hint: Length and Width are reserved words so cannot be used as variable names. Declare your variables as l and w. Use MUL w.

**.386**

**.model flat,stdcall**

**.stack 4096**

**ExitProcess proto,dwExitCode:dword**

**.data**

**l DWORD 30**

**w DWORD 20**

**.code**

**main PROC**

**call RectangleArea**

**INVOKE ExitProcess,0**

**main ENDP**

**RectangleArea PROC**

**mov eax, l**

**mul w**

**ret**

**RectangleArea ENDP**

**end MAIN**

END