

Assignment 3

Due date: 07-11-2023

Spondon Sayeed

I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work.” + Spondon Sayeed + 110101278

[Question One: (8 marks)]

a) Which procedure in the link library generates a random integer within a selected range?

A procedure in the link library that generates a random integer within a selected range is RandomRange.

b) Which procedure in the link library displays "Press [Enter] to continue. . ." and waits for the user to press the Enter key?

A procedure in the link library that waits for the user to press the enter key would be WaitMsg

c) Which procedure in the link library writes an unsigned integer to the console window in decimal format?

A procedure in the link library that writes an unsigned integer to the console window is WriteDec

d) Which procedure in the link library places the cursor at a specific console window location?

a procedure in the link library that places the cursor at a specific console window location is Gotoxy

[Question Two: (4 marks)]

a) When a 32-bit value is pushed on the stack, what happens to ESP?

When a 32-bit value is pushed onto the stack, the ESP register is automatically decremented by 4 to point to the new top of the stack.

b) How is the runtime stack different from the stack abstract data type? Hint: You can refer to extra resources to answer this question. Please cite all your references.

Runtime Stack is directly managed by the cpu itself while ABT stack works with high level languages. This means that runtime stacks and an ABT stacks serve different purposes. The former is specifically for managing the execution flow of a program, whereas the latter is a general-purpose data structure for organizing and manipulating data elements.

[Question Three: (4 marks)]

a) Write statements that prompt the user for an identification number and input a string of digits into an array of bytes.

.data

str1 BYTE "Enter identification number: ",0

idStr BYTE 20 DUP(?)

.code

mov edx,OFFSET str1

call WriteString

mov edx,OFFSET idStr

mov ecx,(SIZEOF idStr) - 1

call ReadString

b) Suppose there was no PUSH instruction. Write a sequence of two other instructions that would accomplish the same as PUSH EAX.

sub esp,4

mov [esp],eax

[Question Four: (4 marks)] What are the values that will be pushed/popped into/from ESP respectively during the following nested procedure execution in Figure 1? (Show all of your steps)

	Main Proc	ESP=??
00000040	Call A1	Push = 00000045
00000045	Exit	Push = 00000055
	Main endp	Push = 00000065
		Push = 00000075
	A1 proc	
00000050	Call A2	Pop = 00000075
00000055	Ret	Pop = 00000065
	A1 endp	Pop = 00000055
		Pop = 00000045
	A2 proc	
00000060	Call A3	
00000065	Ret	
	A2 endp	
	A3 proc	
00000070	Call A4	
00000075	Ret	
	A3 endp	
	A4 proc	
00000090	Ret	
	A4 endp	