

Lab 4: Interactive Usage of Link Libraries

Problem 1

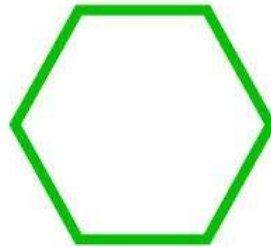


Figure 1: A hexagon

Figure 1 illustrates a hexagon figure with same length of side. To calculate the perimeter of the hexagon, the following formula is given.

$$\text{Perimeter_hexagon1} = \text{side1} + \text{side2} + \text{side3} + \text{side4} + \text{side5} + \text{side6}$$

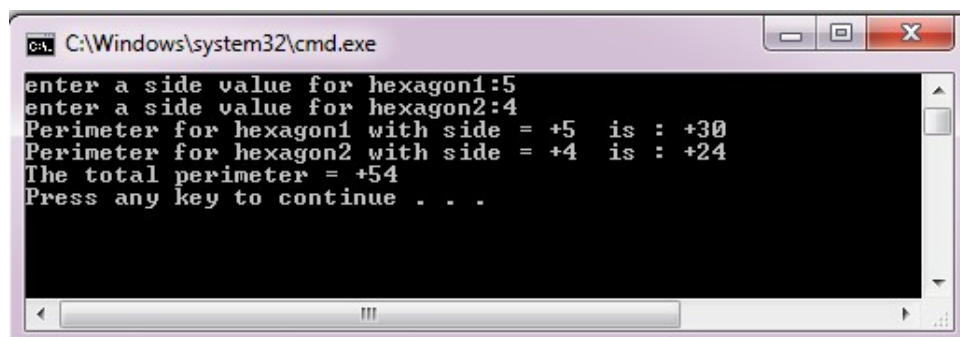
$$\text{Perimeter_hexagon2} = \text{side1} + \text{side2} + \text{side3} + \text{side4} + \text{side5} + \text{side6}$$

$$\text{TotalPerimeter} = \text{Perimeter_hexagon1} + \text{Perimeter_hexagon2}$$

Write a complete program using assembly language to calculate the perimeter of TWO different hexagons with different sizes.

In the program, you should do these steps:

- i. Get two values from keyboard (32-bit unsigned integer) and save into the variable name *sideHex1* for the first hexagon and *sideHex2* for the second hexagon.
- ii. Calculate both of the perimeters (Example: Perimeter_hexagon1=18 → 3+3+3+3+3+3) by using LOOP instruction. Save the first result in *Perimeter_hexagon1* and the second result in *Perimeter_hexagon2* (as 32-bit unsigned integer).
- iii. Then, add the two perimeters and save in *TotalPerimeter* variable.
- iv. Display the output as shown in Figure 2.

A screenshot of a Windows command prompt window. The title bar shows 'C:\Windows\system32\cmd.exe'. The window contains the following text:

```
enter a side value for hexagon1:5
enter a side value for hexagon2:4
Perimeter for hexagon1 with side = +5 is : +30
Perimeter for hexagon2 with side = +4 is : +24
The total perimeter = +54
Press any key to continue . . .
```

Figure 2: The Output

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Problem 2

- Write a program in assembly language to multiply two unsigned numbers.
- Your program should ask the user to input the multiplicand (n) and the multiplier (m).
- The program will do multiplication of (n x m) using MUL.
- Your program should store the multiplicand, multiplier and the result in these variables **multiplicand**, **multiplier** and **product** respectively.

Sample output



Extra Challenge: Rewrite your program and ask either user want to continue the calculation (Yes/No). If Yes, user can have a selection either perform MUL or DIV. If No, print “Thank you” and exit the program.

Problem 3

Write a program that will **interactively** ask the **user to input the values of 6 integers** in DWORD and you have to put the values into an array name HELLO.

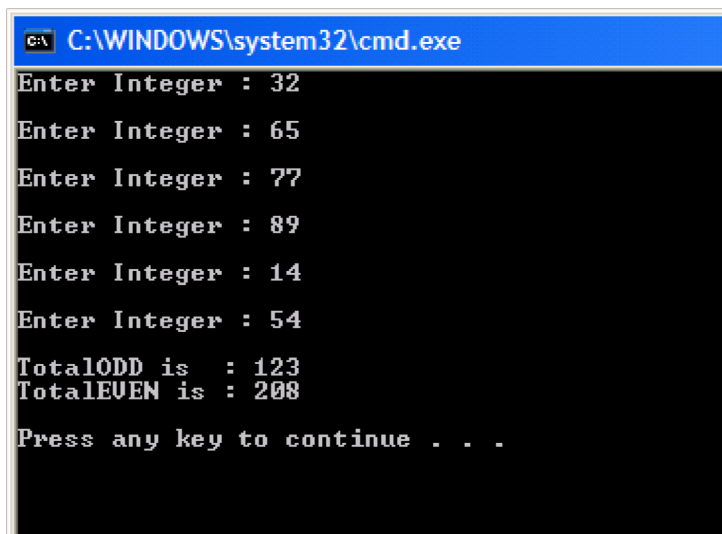
- Example of HELLO array after the user input the values:

1 st Value	2 nd Value	3 rd Value	4 th Value	5 th Value	6 th Value
HELLO[0]	HELLO[4]	HELLO[8]	HELLO[12]	HELLO[16]	HELLO[20]
32	65	77	89	14	54

- Your CountEVEN will count the value of HELLO[0], HELLO[8] and HELLO[16] and store it in variable name TotalEVEN
- Your CountODD will count the value of HELLO[4], HELLO[12] and HELLO[20] store it in variable name TotalODD
- Lastly, display the value of TotalEVEN and TotalODD
- **You must use LOOP instruction to do the addition process.**

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Sample output



```
C:\WINDOWS\system32\cmd.exe
Enter Integer : 32
Enter Integer : 65
Enter Integer : 77
Enter Integer : 89
Enter Integer : 14
Enter Integer : 54
TotalODD is : 123
TotalEVEN is : 208
Press any key to continue . . .
```

Extra Challenge: Rewrite your program and calculate the TotalALL by adding TotalODD and TotalEVEN. Finally, display the value of TotalALL at the centre of the screen.

What to submit

- You will submit all the source code of *.asm* files (in its original format) in e-learning, submission section will be provided.