Lab 5

This week's lab will focus on **revising Labs 1–4** and the instructions covered up to **Lecture 16**. You will be asked to complete two questions in the lab (one for practice and one for evaluation).

Practice Question
You have to write an ALP program for 8086 to encrypt messages so that messages are not decoded/intercepted easily by third parties.

Write an ALP that performs the following.
1)Display the message: "Enter a string with maximum 20 characters." and allow the user to input the string in the next line.[Note: The entered string may be stored in location labelled string1. The actual length of the string entered may be stored in a location labelled len.]
eg:
string1 db "Hello world"
2)The string in 'string1' should be reversed and stored in a location labelled encrypted (e.g. the encrypted becomes “dlrow olleH")
Then, the bits of each character in this encrypted is flipped, rotated right by value stored in the memory location labelled shifter, and stored back in the location labelled encrypted. [Note: value in shifter is a byte value]
3)The encrypted message is then displayed as "The encrypted string is <encrypted string>"

Evaluative Question for Mondays Batch (P1/P2)

Write an ALP which performs the following.

1)Display the message: "Enter a 5-digit number." and allow the user to input the number.

2)Based in the number entered, display 'Odd/Even and Negative/Positive.'

3)Ask the user: "Do you want to enter another number? (Y/N)"

4)If the user enters 'Y', repeat the process from step 1.

5)If the user enters 'N', display "Exiting..." and terminate the program.

Sample Solution

```
D:\>mon2
Enter a 5-digit number
12345
Odd and Positive
Do you want to enter another number (Y/N)
Y
Enter a 5-digit number
12346
Even and Positive
Do you want to enter another number (Y/N)
Y
Enter a 5-digit number
98765
Odd and Negative
Do you want to enter another number (Y/N)
Y
Enter a 5-digit number
98766
Even and Negative
Do you want to enter another number (Y/N)
N
Exiting
```

Evaluative Question for P3/P4

Write an ALP which performs the following.

1)Display the message: "Enter the string to be compared." and allow the user to input the 4 characters via the keyboard in the next line.

2)A string with maximum 20 characters is stored in memory labelled dat1

3)As the user enters each character, the code will check if the four characters are found in continuous locations in dat1

4)If there is a match (entered characters are found in continuous locations in dat1) the code should display Matching string is found '. If there is no match the code should display Matching string is not found '

Sample Solution:

dat1-'hello12345world67890'

```
D:\>TUE1
Enter the string to be compared
hell
Matching string is found
D:\>TUE1
Enter the string to be compared
1234
Matching string is found
D:\>TUE1
Enter the string to be compared
10
Matching string is not found
D:\>TUE1
Enter the string to be compared
6789
Matching string is found
D:\>TUE1
Enter the string to be compared
7890
Matching string is found
D:\>TUE1
Enter the string to be compared
hey
Matching string is not found
```

Evaluative Question for P5/P6

Write an ALP which performs the following.

1)Display the message: "Enter 10 hexadecimal numbers." and allow the user to input the 10 hexadecimal numbers. Note that the characters should not be visible while the user is entering the characters.

2)The even numbers should be stored in a location labelled 'even1' and the odd numbers should be stored in a location labeled 'odd1'

3)Once the 10 characters are entered, the program should display "The entered even numbers are:<>"

And display the" The entered odd numbers are: <>" In the next line

Sample solution:

Tested numbers

1. 12345abcde
2. 1111111111
3. 118967fedc

```
D:\>tue3
Enter 10 hexadecimal numbers
The entered even numbers are:24bd
The entered odd numbers are:135ace
D:\>tue3
Enter 10 hexadecimal numbers
The entered even numbers are:
The entered odd numbers are:1111111111
D:\>tue3
Enter 10 hexadecimal numbers
The entered even numbers are:86fd
The entered odd numbers are:1197ec
```

Evaluative Question for P7/P8

Write an ALP which performs the following.

1)Display the message: "Enter the number of characters." and allow the user to input a number either 4 or 6 in the next line

2)Display the message: "Enter the word." and allow the user to input a word of the specified number of characters

3)Based on the word entered, display the "Entered word is palindrome" or "Entered word is not palindrome" after checking whether the word is a palindrome or not.

4)Ask the user: "Do you want to enter another word ? (Y/N)"

5)If the user enters 'Y', repeat the process from step 1.

6)If the user enters 'N', display "Exiting..." and terminate the program.

```
D:\>TUE4
Enter the number of characters
4
Enter the word
ABAB
Entered word is not palindrome
Do you want to enter another word (Y/N)
Y
Enter the number of characters
4
Enter the word
ABBA
Entered word is palindrome
Do you want to enter another word (Y/N)
Y
Enter the number of characters
6
Enter the word
ABBBBA
Entered word is palindrome
Do you want to enter another word (Y/N)
N
Exiting
```

Evaluative Question for P9/P10/P11/P12

Write an ALP which performs the following.

1)Display the message: "Enter maximum 10 characters." and allow the user to input maximum 10 characters in the next line. Note that the characters should be visible while the user is entering the characters.

2) The program should inspect the string and print only the capital letters in the string in the next line as follows.

"The capital letters in the entered string are " and print the capital letters in the next line.

```
D:\>THU1
Enter  maximum 10 characters
ABAB
The capital letters in the entered string are
ABAB
D:\>THU1
Enter  maximum 10 characters
ABABAaabcA
The capital letters in the entered string are
ABABAA
D:\>_
```

Evaluative Question for P13/P14

Write an ALP which performs the following.

1)Display the message: "Enter a single digit number" and allow the user to a number between 0-3 in the next line. Note that the digit should be visible while the user is entering the digit.

2)Display the message: "Enter another single digit number" and allow the user to a number between 0-6 in the next line. Note that the digit should be visible while the user is entering the digit.

3)Display the message: "Enter operation" and allow the user to enter + symbol in the next line. Note that the digit should be visible while the user is entering the digit.

4) The entered digits should be added and the sum should be displayed as in the sample output

```
D:\>thu2
Enter a single digit number number
3
Enter  another single digit number
5
Enter operation
+
Result is
8
```

Evaluative Question for P15/P16

Write an ALP which performs the following.

1)Display the message: "Enter the hexadecimal no" and allow the user to a number between 0-9 in the next line. Note that the digit should be visible while the user is entering the digit.

2)Count the number of ones in the number and display the same as follows

3)Display the message: "The number of ones in the digit: " as follows

```
D:\>lab
Enter the hexadecimal no
6
The number of ones in the digit :
2
D:\>lab
Enter the hexadecimal no
8
The number of ones in the digit :
1
```

Last modified: Thursday, 20 February 2025, 4:22 PM

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