



Assignment # 5

EE 229 – Computer Organization and Assembly Language

Fall 2021

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Submission Guidelines:

- ✓ Submit Word Document and PDF.
- ✓ Attempt all questions.
- ✓ Late Submissions won't be accepted in any case.
- ✓ Do not use cover page or any file.
- ✓ Comment your code where needed.
- ✓ Not a Handwritten Assignment.
- ✓ Incase Copied:
If (checkPlagiarism () == true)
 setMarks(0);
- ✓ Add appropriate screenshots of executed code, Assembly codes would be submitted in .asm file. Format – RollNo_AssignmentNo_Name

Question No.1.

The Playfair Cipher - An Approach to Encrypt Data

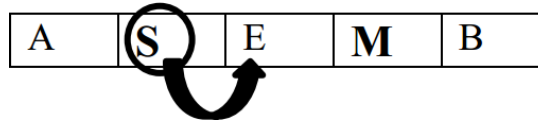
Playfair Cipher uses a 5 X 5 matrix, in which first two rows of the matrix are occupied by key (Used key: ASEMBLYFUN) already initialized in the code. Remaining three rows are filled by an algorithm with letters other than above defined key and in alphabetical order as shown. Here single cell is occupied for I/ J (consider I=J).

A	S	E	M	B
L	Y	F	U	N
C	D	G	H	I/J
K	O	P	Q	R
T	V	X	Y	Z

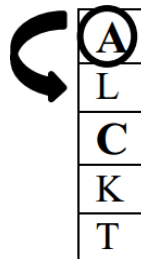
Any string entered by the user is encrypted. String have even number of characters with no repetition. First of all a pair of two letters from the string (left to right) is selected and is searched out in the above matrix if:



1. Both letters are in same row, replace them with letters present to their right. For example In given Row SM pair will replace by EB and EB will replace by MA etc.



2. Both letters are in same column, replace them with the letters present just below to them in that column. For example: In given Column AC will replace by LK and CT by KA etc..



3. Otherwise, replace it with the letter that is in the same row but in the column of the other letter. For example: In given Columns AD will replace by SC and CY by DL etc.



Sample Run:

Enter String: FAST
Encrypted Text: LEAV

1. Initialize the array using the above defined initialization rules. Use your name as key (omit repetition of alphabets).
2. Write a procedure that takes input string of characters from the user. Make sure that user can enter 4 characters only with no repetition.
3. Write procedure that performs the operations according to point 1.
4. Write procedure that performs the operations according to point 2.

5. Write procedure that performs the operations according to point 3.

6. Display the encrypted text.

Question No.2. - Revise Shift and Rotate Instructions

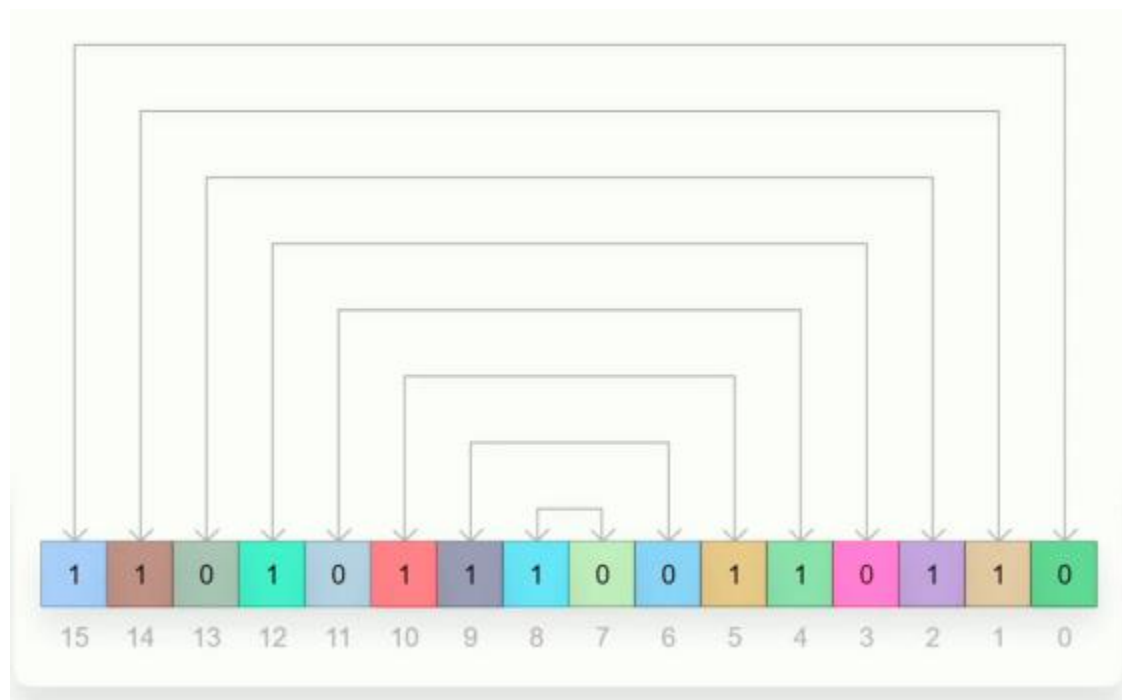
Prompt the user to enter 4-digit hex input. Shift the input according to the following

diagram (Visual demo of shifting is also attached).

Sample Run:

Entered value: 4B4B (0100 1011 0100 1011)

Reverse Output: D2D2 (1101 0010 1101 0010)



GOOD LUCK