# ITC Lab Project

**Project 1**

**Concepts Required:**

- 2-Dimensional Array
- Functions

Make as many functions as possible. The more you implement the concepts mentioned, the more marks you get.

## Problem Statement:

**THE PLAYFAIR CIPHER-** ***An Approach to Encrypt Data***

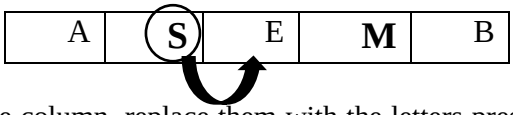
During World War II, the Government of New Zealand used this encryption technique for communication among New Zealand, the Chatham Islands, and the Coastwatcher's in the Pacific Islands.

Playfair Cipher uses a 5 X 5 matrix, in which first two rows of the matrix is occupied by key (For example key: **ASEMBLYFUN)** already initialized in the code**.** Remaining three rows are filled by an algorithm with letters other then above defined key and in alphabetical order as shown.

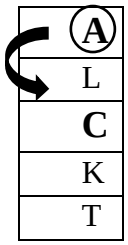
| | | | | |
|---|---|---|---|---|
| **A** | **S** | **E** | **M** | **B** |
| **L** | **Y** | **F** | **U** | **N** |
| C | D | G | H | I/J |
| K | O | P | Q | R |
| T | V | W | X | Z |

Here single cell is occupied for I/ J (consider I=J). Any string entered by the user is encrypted. String should have even number of characters with no repetitions. 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:

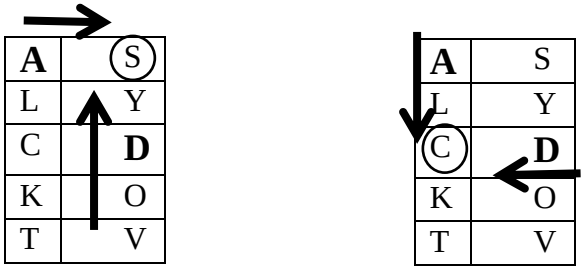
1. Both letters are in same row, replace them with letters present to their right. For example In given Row SM pair will replace by EB and EB will replace by MA etc.




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.




And display the encrypted string as shown.

**Execution Sample:**

```
Enter String: FAST
Encrypted Text: LEAV
```

**Dataset:**

**Use the string data below to test the encryption**

FAST

HAND

PENCIL

DOGS

DESK

FISH

MONITR