Ex.No: 1	**Implementation of Caesar and Playfair Cipher.**	Name : Shaurya
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Aim

To implement the Caesar and Playfair Cipher.

Source Code

Caesar Cipher

Python

```python
def caesar_cipher(text, shift):
    result = ""

    for i in range(len(text)):
        char = text[i]

        if char.isupper():
            result += chr((ord(char) + shift - 65) % 26 + 65)

        elif char.islower():
            result += chr((ord(char) + shift - 97) % 26 + 97)

        else:
            result += char

    return result

text = input("Enter text: ")
shift = int(input("Enter shift: "))

encrypted_text = caesar_cipher(text, shift)
print(f"Encrypted: {encrypted_text}")
```

Playfair Cipher

Python

```python
def generate_key_matrix(key):
    key = key.upper().replace("J", "I")
    matrix = []
    used_chars = set()
```

```
    for char in key:
        if char not in used_chars and char.isalpha():
            matrix.append(char)
            used_chars.add(char)

    for char in "ABCDEFGHIKLMNOPQRSTUVWXYZ":
        if char not in used_chars:
            matrix.append(char)
            used_chars.add(char)

    return [matrix[i:i+5] for i in range(0, 25, 5)]

def find_position(matrix, char):
    for i, row in enumerate(matrix):
        if char in row:
            return i, row.index(char)
    return None

def playfair_encrypt(plaintext, key):
    matrix = generate_key_matrix(key)
    plaintext = plaintext.upper().replace("J", "I").replace(" ", "")
    ciphertext = ""

    i = 0
    while i < len(plaintext):
        a = plaintext[i]
        b = plaintext[i + 1] if i + 1 < len(plaintext) else 'X'

        if a == b:
            b = 'X'
            i -= 1

        row_a, col_a = find_position(matrix, a)
        row_b, col_b = find_position(matrix, b)

        if row_a == row_b:
            ciphertext += matrix[row_a][(col_a + 1) % 5]
            ciphertext += matrix[row_b][(col_b + 1) % 5]
        elif col_a == col_b:
            ciphertext += matrix[(row_a + 1) % 5][col_a]
            ciphertext += matrix[(row_b + 1) % 5][col_b]
        else:
            ciphertext += matrix[row_a][col_b]
            ciphertext += matrix[row_b][col_a]

        i += 2

    return ciphertext

key = input("Enter key: ")
```

```
plaintext = input("Enter plaintext: ")
ciphertext = playfair_encrypt(plaintext, key)

print(f"Plaintext: {plaintext}")
print(f"Ciphertext: {ciphertext}")
```

Sample Input and Output

Input - Caesar Cipher

Enter text: My name is Shaurya.
Enter shift: 4

Output

Encrypted: Qc reqi mw Wleyvce.

```
Enter text: My name is Shaurya.
Enter shift: 4
Encrypted: Qc reqi mw Wleyvce.
```

Input - Playfair Cipher

Enter key: shaurya
Enter plaintext: My name is Shaurya
Plaintext: My name is Shaurya

Output

Ciphertext: TFOHQYFAHAURSEUW

```
Enter key: shaurya
Enter plaintext: My name is Shaurya
Plaintext: My name is Shaurya
Ciphertext: TFOHQYFAHAURSEUW
```

Result

Thus we have implemented the Caesar and Playfair Ciphers.