CRYPTOGRAPHY AND NETWORK SECURITY

LAB 1 : WRITE A CODE OF THE FOLLOWING IN YOUR SUITABLE PROGRAMMING LANGUAGE(PYTHON/C/C++/JAVA)

i. CAESER CIPHER

ii. PLAYFAIR CIPHER

NAME : OM SUBRATO DEY

REGISTER NUMBER : 21BAI1876

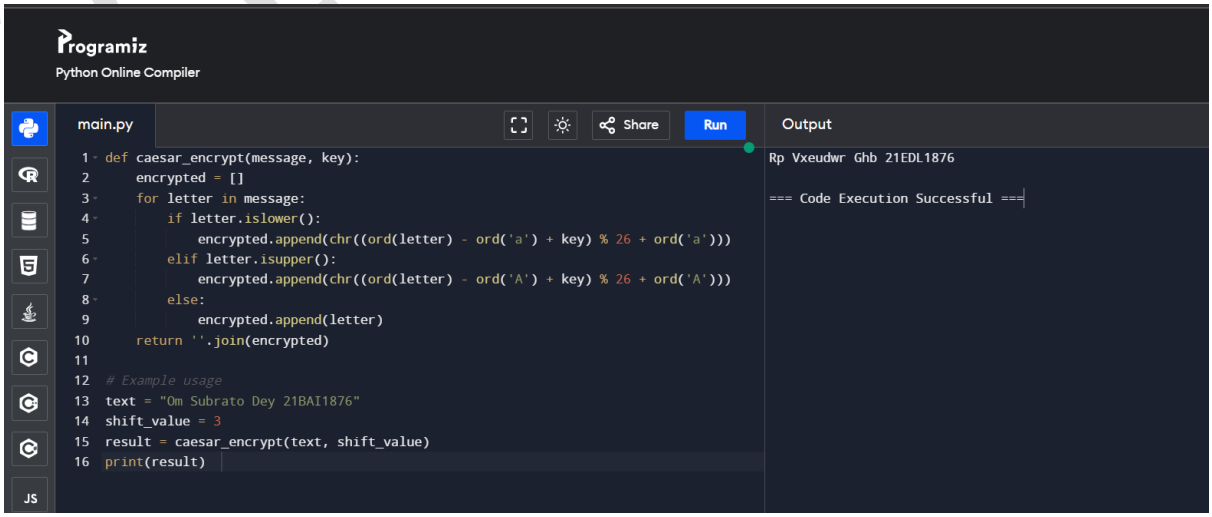
i. CAESER CIPHER:

CODE:

```
def caesar_encrypt(message, key):
    encrypted = []
    for letter in message:
        if letter.islower():
            encrypted.append(chr((ord(letter) - ord('a') + key) % 26 + ord('a')))
        elif letter.isupper():
            encrypted.append(chr((ord(letter) - ord('A') + key) % 26 + ord('A')))
        else:
            encrypted.append(letter)
    return ''.join(encrypted)

text = "Om Subrato Dey 21BAI1876"
shift_value = 3
result = caesar_encrypt(text, shift_value)
print(result)
```

OUTPUT SCREENSHOT:



ii. PLAYFAIR CIPHER:

CODE:

```
def forge_key_square(keyword):
    # Remove duplicates while preserving order
    keyword = ''.join(sorted(set(keyword),
key=keyword.index))
    # Create the 5x5 matrix
    alphabet = 'ABCDEFGHIKLMNOPQRSTUVWXYZ'
    square = []
    for char in keyword + alphabet:
        if char not in square and char != 'J':  # 'I' and
'J' are treated as the same letter
            square.append(char)
    # Split the list into a 5x5 grid
    return [square[i:i+5] for i in range(0, 25, 5)]


def prepare_message(message):
    message = ''.join(filter(str.isalnum,
message.upper())).replace('J', 'I')
    prepared = []
    i = 0
    while i < len(message):
        first = message[i]
        if i + 1 < len(message):
            second = message[i + 1]
        else:
            second = 'X'
        if first == second:
            prepared.append(first + 'X')
            i += 1
```

```
        else:
            prepared.append(first + second)
            i += 2
    if len(prepared[-1]) == 1:
        prepared[-1] += 'X'
    return prepared

def locate_position(square, char):
    for row in range(5):
        for col in range(5):
            if square[row][col] == char:
                return row, col
    return None

def encrypt_digraph(square, digraph):
    row1, col1 = locate_position(square, digraph[0])
    row2, col2 = locate_position(square, digraph[1])

    if row1 == row2:
        return square[row1][(col1 + 1) % 5] +
square[row2][(col2 + 1) % 5]
    elif col1 == col2:
        return square[(row1 + 1) % 5][col1] + square[(row2 +
1) % 5][col2]
    else:
        return square[row1][col2] + square[row2][col1]

def playfair_encryption(message, keyword):
    key_square = forge_key_square(keyword)
    prepared_msg = prepare_message(message)
    encrypted_msg = ''
```

```
    for digraph in prepared_msg:
        encrypted_msg += encrypt_digraph(key_square, digraph)
    return encrypted_msg

keyword = "KEYWORD"
message = "Om Subrato Dey 21BAI1876"
ciphertext = playfair_encryption(message, keyword)
print(ciphertext)
```

OUTPUT SCREENSHOT: