TUGAS 5 MODUL 6

(PLAYFAIR CIPHER)

PRAKTIK SISTEM KEAMANAN DATA

Disusun Oleh :

Herdina Fitri Desfiastuti
V3922023

Dosen :

Yusuf Fadlila Rachman, S.Kom., M.Kom

PS D-III TEKNIK INFORMATIKA

SEKOLAH VOKASI

UNIVERSITAS SEBELAS MARET

2024

a) Input


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Code
JupyterLab
Python 3 (ipykernel)
[1]:
# Playfair Cipher Implementation in Python
# Nama Lengkap: Herdina Fitri Desfiastuti
# Kata Kunci: Bangunsari
# Fungsi untuk membuat matriks Playfair dari kata kunci
def generate_playfair_matrix(keyword):
keyword = keyword.upper().replace("J", "I") # Mengganti huruf J dengan I sesuai aturan Playfair
matrix = []
seen = set()
# Menambahkan huruf dari keyword ke matriks
for char in keyword:
if char not in seen and char.isalpha():
matrix.append(char)
seen.add(char)
# Menambahkan huruf alfabet lainnya ke matriks
for char in "ABCDEFGHIKLMNOPQRSTUVWXYZ":
if char not in seen:
matrix.append(char)
seen.add(char)
# Mengubah list menjadi matriks 5x5
return [matrix[i:i+5] for i in range(0, 25, 5)]


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Code
JupyterLab
Python 3 (ipykernel)
# Fungsi untuk memformat teks (menghilangkan spasi, mengganti J dengan I, dan menambahkan X jika diperlukan)
def format_text(text):
text = text.upper().replace("J", "I").replace(" ", "")
formatted = ""
i = 0
while i < len(text):
if i + 1 < len(text) and text[i] == text[i + 1]:
formatted += text[i] + "X"
i += 1
else:
formatted += text[i]
if i + 1 < len(text):
formatted += text[i + 1]
else:
formatted += "X"
i += 2
return formatted
# Fungsi untuk menemukan posisi huruf di dalam matriks
def find_position(matrix, char):
for row in range(5):
for col in range(5):
if matrix[row][col] == char:
return row, col

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Code JupyterLab Python 3 (ipykernel)

```
# Fungsi untuk mengenkripsi teks menggunakan Playfair cipher
def encrypt_playfair(plaintext, matrix):
    plaintext = format_text(plaintext)
    ciphertext = ""

    for i in range(0, len(plaintext), 2):
        row1, col1 = find_position(matrix, plaintext[i])
        row2, col2 = find_position(matrix, plaintext[i + 1])

        # Jika huruf berada di baris yang sama
        if row1 == row2:
            ciphertext += matrix[row1][(col1 + 1) % 5]
            ciphertext += matrix[row2][(col2 + 1) % 5]
        # Jika huruf berada di kolom yang sama
        elif col1 == col2:
            ciphertext += matrix[(row1 + 1) % 5][col1]
            ciphertext += matrix[(row2 + 1) % 5][col2]
        # Jika huruf berada di baris dan kolom yang berbeda
        else:
            ciphertext += matrix[row1][col2]
            ciphertext += matrix[row2][col1]

    return ciphertext

# Fungsi untuk mendekripsi teks menggunakan Playfair cipher
def decrypt_playfair(ciphertext, matrix):
    plaintext = ""
```

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Code JupyterLab Python 3 (ipykernel)

```
    for i in range(0, len(ciphertext), 2):
        row1, col1 = find_position(matrix, ciphertext[i])
        row2, col2 = find_position(matrix, ciphertext[i + 1])

        # Jika huruf berada di baris yang sama
        if row1 == row2:
            plaintext += matrix[row1][(col1 - 1) % 5]
            plaintext += matrix[row2][(col2 - 1) % 5]
        # Jika huruf berada di kolom yang sama
        elif col1 == col2:
            plaintext += matrix[(row1 - 1) % 5][col1]
            plaintext += matrix[(row2 - 1) % 5][col2]
        # Jika huruf berada di baris dan kolom yang berbeda
        else:
            plaintext += matrix[row1][col2]
            plaintext += matrix[row2][col1]

    return plaintext

# Kata kunci dan nama
keyword = "Bangunsari"
plaintext = "Herdina Fitri Desfiastuti"

# Membuat matriks Playfair
matrix = generate_playfair_matrix(keyword)

# Menampilkan matriks Playfair
print("Matriks Playfair:")
```

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Code JupyterLab Python 3 (ipykernel)

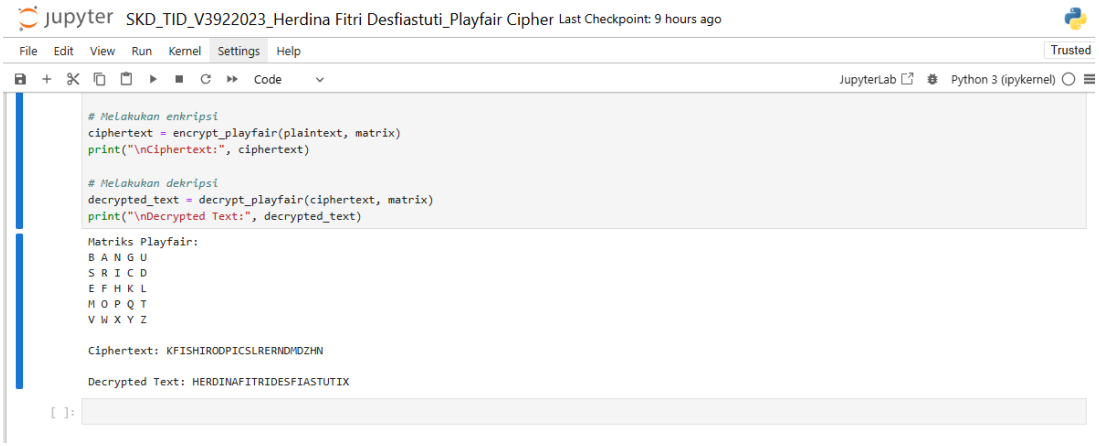
```
# Menampilkan matriks Playfair
print("Matriks Playfair:")
for row in matrix:
    print(" ".join(row))

# Melakukan enkripsi
ciphertext = encrypt_playfair(plaintext, matrix)
print("\nCiphertext:", ciphertext)

# Melakukan dekripsi
decrypted_text = decrypt_playfair(ciphertext, matrix)
print("\nDecrypted Text:", decrypted_text)
```

```
Matriks Playfair:
```

b) Output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Code
JupyterLab
Python 3 (ipykernel)
# Melakukan enkripsi
ciphertext = encrypt_playfair(plaintext, matrix)
print("\nCiphertext:", ciphertext)
# Melakukan dekripsi
decrypted_text = decrypt_playfair(ciphertext, matrix)
print("\nDecrypted Text:", decrypted_text)
Matriks Playfair:
B A N G U
S R I C D
E F H K L
M O P Q T
V W X Y Z
Ciphertext: KFISHIRODPICSLRERNDMDZHN
Decrypted Text: HERDINAFITRIDESFIASTUTIX
[ ]: