KODE PROGRAM

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import numpy as np
from numpy.linalg import inv, det, solve

def input_matrix(rows, cols):

    matrix = []
    print("Masukkan elemen matriks ")
    for i in range(rows):
        row = []
        for j in range(cols):
            element = int(input(f"Masukan elemen matriks  {i + 1} kolom {j + 1}:
"))
            row.append(element)
        matrix.append(row)
    return np.array(matrix)

def display_matrix(matrix):
    print("Matriks:")
    print(matrix)

def add_matrix_2x2(matrix_a, matrix_b):
    return matrix_a + matrix_b

def subtract_matrix_2x2(matrix_a, matrix_b):
    return matrix_a - matrix_b

def transpose_2x2(matrix):
    return matrix.T
def transpose_3x3(matrix):
        return matrix.T

def determinant_2x2(matrix):
    return np.linalg.det(matrix)

def determinant_3x3(matrix):
    return np.linalg.det(matrix)

def inverse_2x2(matrix):
    return np.linalg.inv(matrix)

def solve_linear_system_2x2(coefficients, constants):
    return np.linalg.solve(coefficients, constants)
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def main():
    while True:


        print("==SELAMAT DATANG DIOPERASI PERHITUNGAN MATRIKS==")
        print("                    MENU                      ")
        print("..............................................")
        print("1. Penjumlahan dan Pengurangan Matriks")
        print("2. Matriks Transpose")
        print("3. Matriks Invers")
        print("4. Determinan")
        print("5. Sistem Persamaan Linier")
        print("6. Keluar")

        menu = int(input("Pilih menu (1-6): "))

        if menu == 1:
            print("Sub Menu :")
            print("1. Penjumlahan")
            print("2. Pengurangan")
            sub_menu = int(input("Pilih sub-menu untuk penjumlahan/pengurangan
matriks ordo 2x2 : "))
            matrix_a = input_matrix(2, 2)
            matrix_b = input_matrix(2,2)

            if sub_menu == 1:
                result = add_matrix_2x2(matrix_a, matrix_b)
                print("Hasil penjumlahan matriks A dan B:")
                display_matrix(result)
            elif sub_menu == 2:
                result = subtract_matrix_2x2(matrix_a, matrix_b)
                print("Hasil pengurangan matriks A dan B:")
                display_matrix(result)
            else:
                print("Sub-menu tidak valid.")

        elif menu == 2:
            print("1. Ordo 2x2")
            print("2. Ordo 3x3")
            sub_menu = int(input("Pilih sub-menu untuk matriks transpose (1/2):
"))

            if sub_menu == 1:
                matrix = input_matrix(2, 2)
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                result = transpose_2x2(matrix)
                print("Hasil matriks Transpose 2x2:")
                display_matrix(result)
            elif sub_menu == 2:
                matrix = input_matrix(3, 3)
                result = transpose_3x3(matrix)
                print("Hasil matriks Transpose 3x3:")
                display_matrix(result)
            else:
                print("Sub-menu tidak valid.")


        elif menu == 3:
                print("Menghitung matriks invers ordo 2x2")

                matrix = input_matrix(2, 2)
                result = inverse_2x2(matrix)
                print("Hasil matriks balikan 2x2:")
                display_matrix(result)

        elif menu == 4:
            print("Pilih sub_menu")
            print("1. Ordo 2x2")
            print("2. Ordo 3x3")
            sub_menu = int(input("Pilih sub-menu untuk determinan (1/2): "))

            if sub_menu == 1:
                matrix = input_matrix(2, 2)
                result = determinant_2x2(matrix)
                print(f"Determinan matriks 2x2: {result}")
            elif sub_menu == 2:
                matrix = input_matrix(3, 3)
                result = determinant_3x3(matrix)
                print(f"Determinan matriks 3x3: {result}")
            else:
                print("Sub-menu tidak valid.")

        elif menu == 5:
                print("Menghitung SPL 2X3")
                coefficients = input_matrix(2, 2)
                constants = np.array(list(map(int, input("Masukkan konstanta
(baris 1, baris 2): ").split())))
                result = solve_linear_system_2x2(coefficients, constants)
                print("Hasil sistem persamaan linier 2x2:")
                print(f"x = {result[0]}")
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                print(f'y = {result[1]}')

        elif menu == 6:
            print("Terima kasih! Program selesai.")
            break

        else:
            print("Pilihan tidak valid. Silakan pilih lagi.")

if __name__ == "__main__":
    main()
```