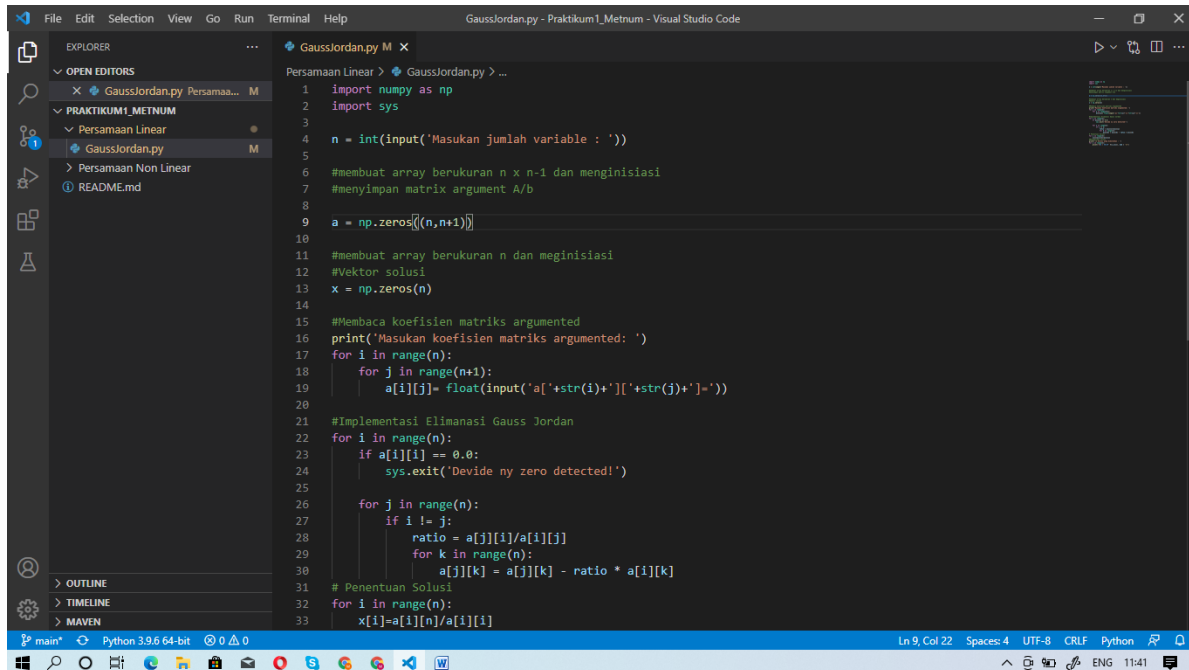


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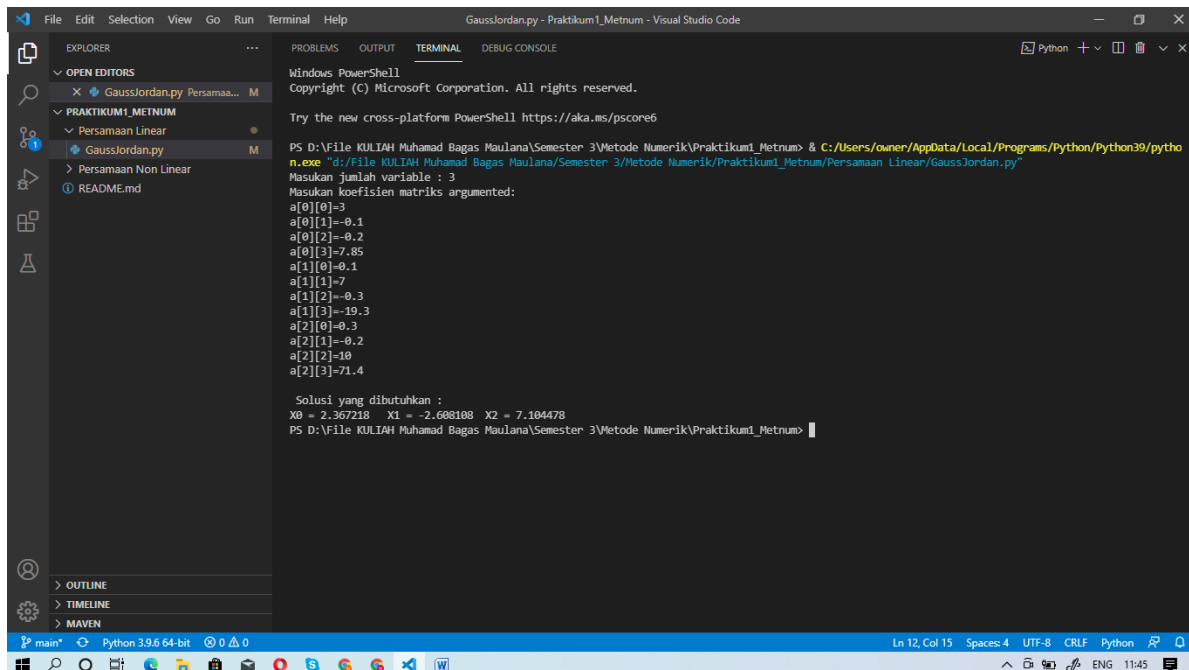
Kelas : TIF3A5

Contoh Gauss Jordan



```
1 import numpy as np
2 import sys
3
4 n = int(input('Masukan jumlah variable : '))
5
6 #membuat array berukuran n x n-1 dan menginisiasi
7 #menyimpan matrix argument A/b
8
9 a = np.zeros((n,n+1))
10
11 #membuat array berukuran n dan menginisiasi
12 #vektor solusi
13 x = np.zeros(n)
14
15 #Membaca koefisien matriks argumented
16 print('Masukan koefisien matriks argumented: ')
17 for i in range(n):
18     for j in range(n+1):
19         a[i][j] = float(input('a['+str(i)+'']['+str(j)+'']= '))
20
21 #Implementasi Eliminasi Gauss Jordan
22 for i in range(n):
23     if a[i][i] == 0.0:
24         sys.exit('Devide ny zero detected!')
25
26     for j in range(n):
27         if i != j:
28             ratio = a[j][i]/a[i][i]
29             for k in range(n):
30                 a[j][k] = a[j][k] - ratio * a[i][k]
31
32 # Penentuan Solusi
33 for i in range(n):
34     x[i] = a[i][n]/a[i][i]
```

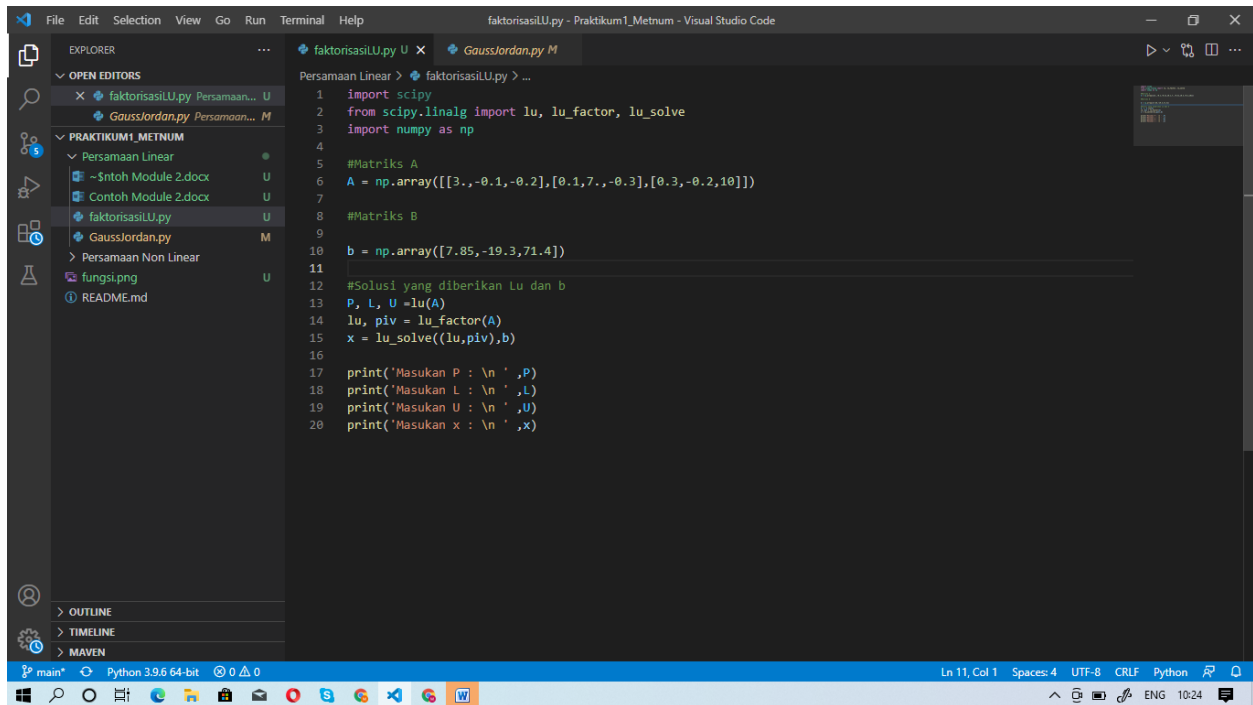
Hasil.



```
PS D:\File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum> & C:/Users/owner/AppData/Local/Programs/Python/Python39/python
n.exe "d:/File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum\Persamaan Linear\GaussJordan.py"
Masukan jumlah variable : 3
Masukan koefisien matriks argumented:
a[0][0]=3
a[0][1]=-0.1
a[0][2]=-0.2
a[0][3]=7.85
a[1][0]=0.1
a[1][1]=7
a[1][2]=-0.3
a[1][3]=-19.3
a[2][0]=0.3
a[2][1]=-0.2
a[2][2]=10
a[2][3]=71.4

Solusi yang dibutuhkan :
X0 = 2.367218 X1 = -2.608108 X2 = 7.104478
PS D:\File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum>
```

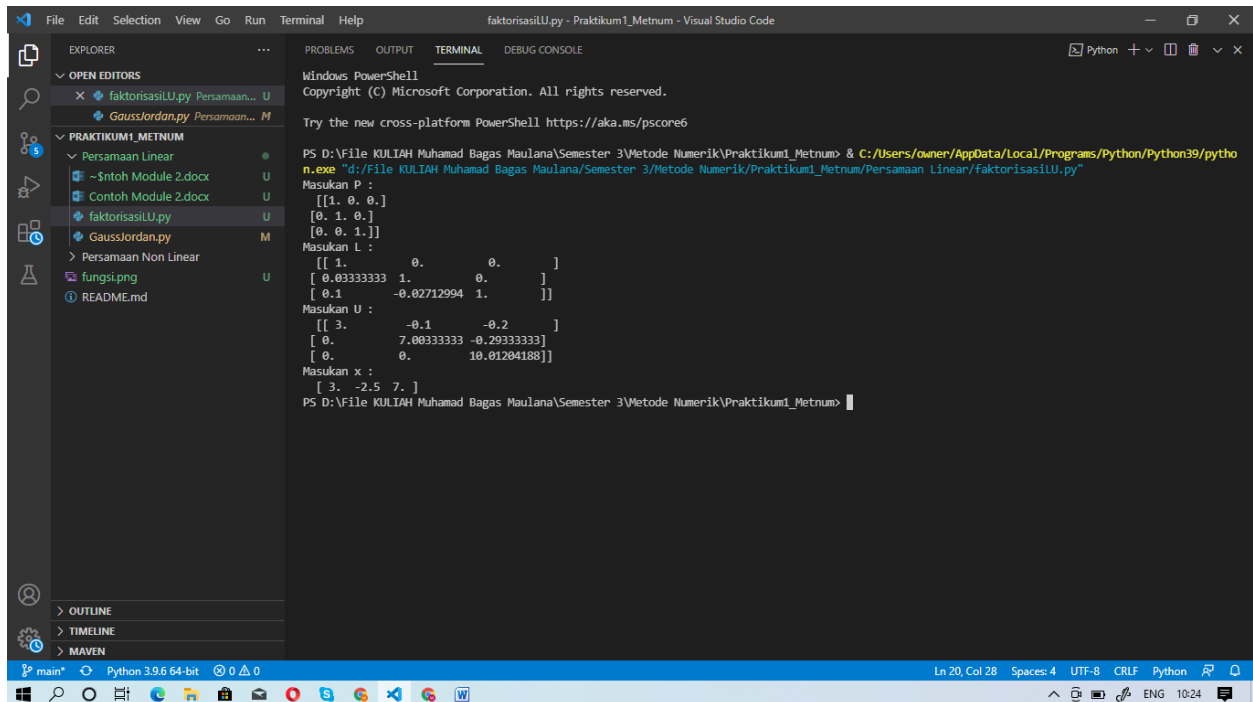
Metode Matriks LU



The screenshot shows the Visual Studio Code editor with a Python file named `faktorisasiLU.py` open. The code implements LU decomposition using NumPy. The matrix `A` is defined as $\begin{bmatrix} 3 & -0.1 & -0.2 \\ 0.1 & 7 & -0.3 \\ 0.3 & -0.2 & 10 \end{bmatrix}$ and the vector `b` is $[7.85, -19.3, 71.4]$. The code uses `lu` from `scipy.linalg` to perform the decomposition. The output shows the matrices `P`, `L`, and `U`, and the solution vector `x`.

```
1 import scipy
2 from scipy.linalg import lu, lu_factor, lu_solve
3 import numpy as np
4
5 #Matriks A
6 A = np.array([[3.,-0.1,-0.2],[0.1,7.,-0.3],[0.3,-0.2,10]])
7
8 #Matriks B
9
10 b = np.array([7.85,-19.3,71.4])
11
12 #Solusi yang diberikan Lu dan b
13 P, L, U =lu(A)
14 lu, piv = lu_factor(A)
15 x = lu_solve((lu,piv),b)
16
17 print('Masukan P : \n ',P)
18 print('Masukan L : \n ',L)
19 print('Masukan U : \n ',U)
20 print('Masukan x : \n ',x)
```

Hasil



The screenshot shows the terminal output of the Python program. It displays the matrices `P`, `L`, and `U`, and the solution vector `x`. The output is as follows:

```
PS D:\File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum> n.exe "d:/File KULIAH Muhamad Bagas Maulana/Semester 3/Metode Numerik/Praktikum1_Metnum/Persamaan Linear/faktorisasiLU.py"
Masukan P :
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
Masukan L :
[[1.          0.          0.          ]
 [ 0.03333333  1.          0.          ]
 [ 0.1        -0.02712994  1.          ]]
Masukan U :
[[ 3.          -0.1          -0.2          ]
 [ 0.          7.00333333 -0.29333333]
 [ 0.          0.          10.01204188]]
Masukan x :
[ 3. -2.5  7.]
PS D:\File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum>
```

Metode Gauss Seidel

[illegible]

Hasil.

The screenshot shows the Visual Studio Code interface with the following components:

- Explorer Panel (Left):** Displays the file structure of the 'PRAKTIKUM1_METNUM' project. The files listed are:
 - ~\$ntoh Module 2.docx
 - Contoh Module 2.docx
 - faktorisasiLU.py
 - GaussJordan.py
 - GaussSeidel.py (selected)
 - Persamaan Non Linear
 - fungsi.png
 - README.md
- Terminal Panel (Right):** Shows the output of the Python script 'GaussSeidel.py'. The output includes:
 - Windows PowerShell
 - Copyright (C) Microsoft Corporation. All rights reserved.
 - Try the new cross-platform PowerShell <https://aka.ms/powershell>
 - PS D:\File KULIAH Muhamad Bagas Maulana\Semester 3\Metode Numerik\Praktikum1_Metnum> python C:\Users\owner\AppData\Local\Programs\Python\Python39\python.exe "d:/File KULIAH Muhamad Bagas Maulana/Semester 3/Metode Numerik/Praktikum1_Metnum/Persamaan Linear/GaussSeidel.py"
 - Input toleransi error: 0.00001
 - A table of results for steps 1 through 4:

Step	x	y	z
1	2.8167	-2.7117	7.0013
2	2.9930	-2.4998	7.0002
3	3.0000	-2.5000	7.0000
4	3.0000	-2.5000	7.0000

The terminal also displays the solution values: Solusi : x = 3.000, y = -2.500 and z = 7.000.