

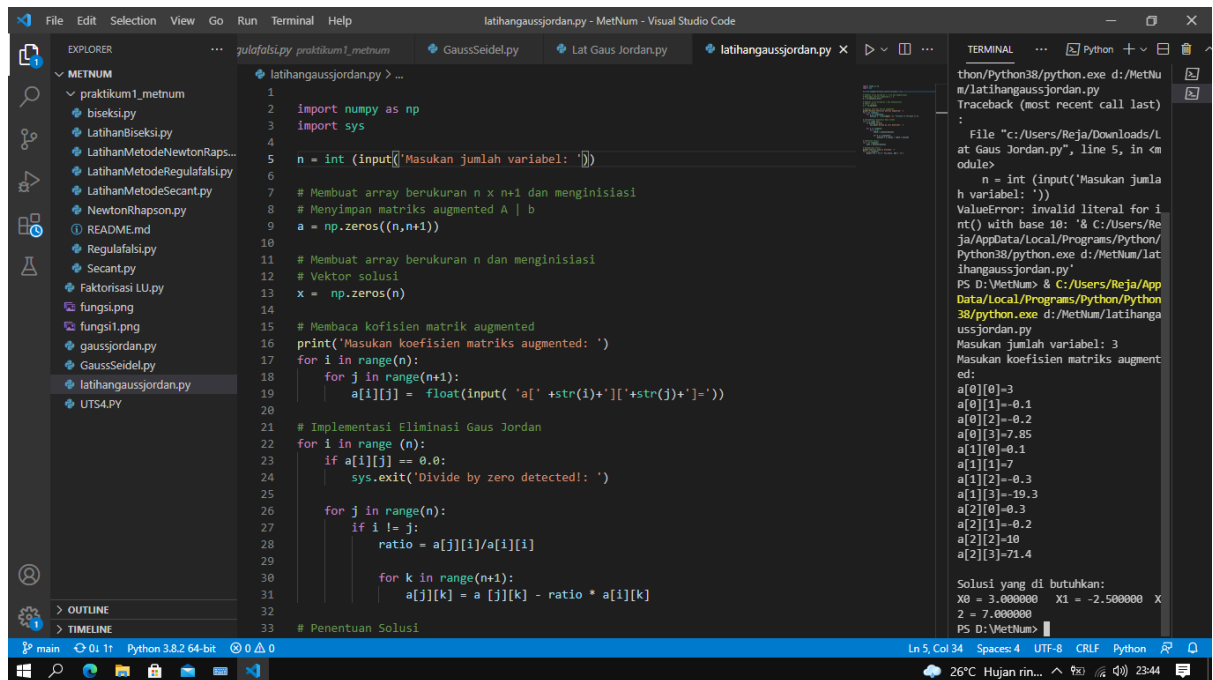
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TUGAS 2 METODE NUMERIK

1. Latihan GaussJordan.py

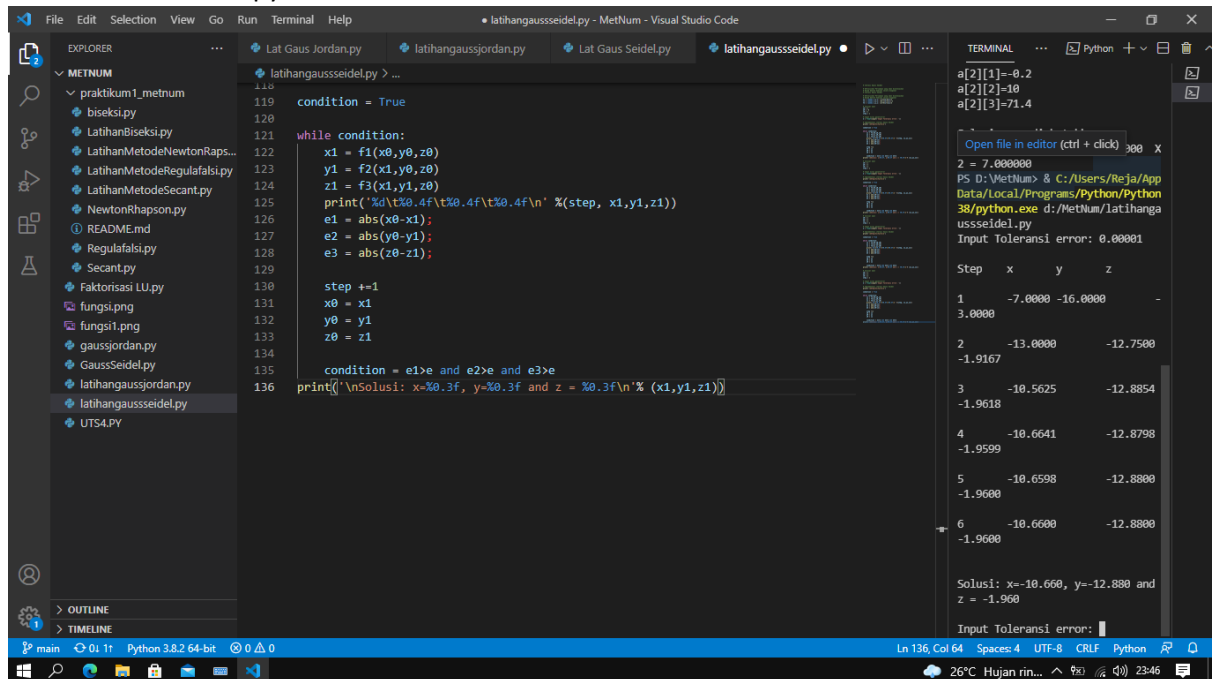


```
1
2 import numpy as np
3 import sys
4
5 n = int(input("Masukan jumlah variabel: "))
6
7 # Membuat array berukuran n x n+1 dan menginisiasi
8 # Menyimpan matriks augmented A | b
9 a = np.zeros((n,n+1))
10
11 # Membuat array berukuran n dan menginisiasi
12 # Vektor solusi
13 x = np.zeros(n)
14
15 # Membaca koefisien matriks augmented
16 print("Masukan koefisien matriks augmented: ")
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 Gaus Jordan
22 for i in range(n):
23     if a[i][i] == 0.0:
24         sys.exit("Divide by zero detected!")
25
26     for j in range(n):
27         if i != j:
28             ratio = a[j][i]/a[i][i]
29
30             for k in range(n+1):
31                 a[j][k] = a[j][k] - ratio * a[i][k]
32
33 # Penentuan Solusi
```

thor/Python38/python.exe d:/MetNum/LatihanGaussJordan.py
Traceback (most recent call last):
File "c:/Users/Reja/Downloads/LatihanGaussJordan.py", line 5, in <module>
n = int(input("Masukan jumlah variabel: "))
ValueError: invalid literal for int() with base 10: 'C:/Users/Reja/AppData/Local/Programs/Python/Python38/python.exe d:/MetNum/LatihanGaussJordan.py'
PS D:\MetNum> & C:/Users/Reja/AppData/Local/Programs/Python/Python38/python.exe d:/MetNum/LatihanGaussJordan.py
Masukan jumlah variabel: 3
Masukan koefisien matriks augmented:
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 di butuhkan:
X0 = 3.000000 X1 = -2.500000 X2 = 7.000000
PS D:\MetNum>

2. Latihan GaussSeidel.py



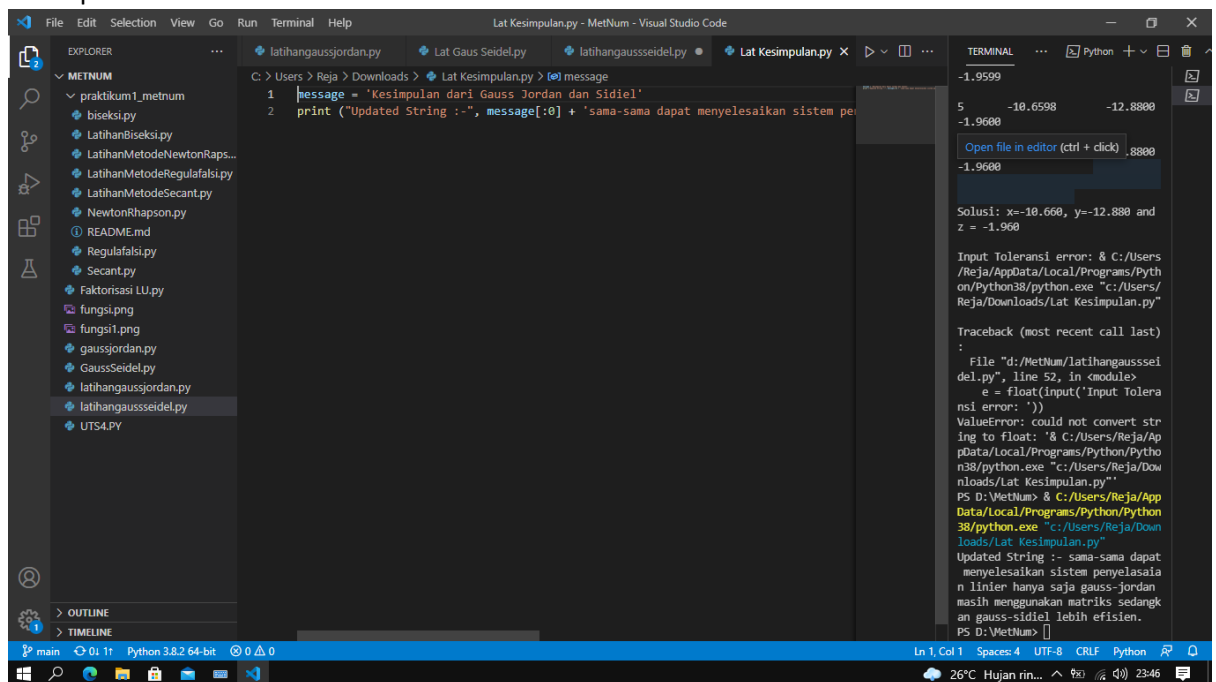
The screenshot shows the Visual Studio Code interface with the file `latihangausseidel.py` open. The code implements the Gauss-Seidel method for solving a system of linear equations. The terminal output shows the execution results, including the input matrix, the tolerance error, and the solution values for x, y, and z.

```
118 condition = True
119
120 while condition:
121     x1 = f1(x0,y0,z0)
122     y1 = f2(x1,y0,z0)
123     z1 = f3(x1,y1,z0)
124     print('%d\t%f\t%f\t%f\t%f\n' %(step, x1,y1,z1))
125     e1 = abs(x0-x1);
126     e2 = abs(y0-y1);
127     e3 = abs(z0-z1);
128
129     step +=1
130     x0 = x1
131     y0 = y1
132     z0 = z1
133
134 condition = e1>e and e2>e and e3>e
135 print('\nSolusi: x=%0.3f, y=%0.3f and z = %0.3f\n' %(x1,y1,z1))
```

Terminal Output:

```
a[2][1]=-0.2
a[2][2]=-10
a[2][3]=-71.4
2 = 7.000000
PS D:\MetNum> & C:/Users/Reja/App
Data/Local/Programs/Python/Python
38/python.exe d:/MetNum/latihanga
usseidel.py
Input Toleransi error: 0.00001
Step x y z
1 -7.0000 -16.0000 -
3.0000
2 -13.0000 -12.7500
-1.9167
3 -10.5625 -12.8854
-1.9618
4 -10.6641 -12.8798
-1.9599
5 -10.6598 -12.8800
-1.9600
6 -10.6600 -12.8800
-1.9600
Solusi: x=-10.660, y=-12.880 and
z = -1.960
Input Toleransi error: 0.00001
```

3. Kesimpulan



The screenshot shows the Visual Studio Code interface with the file `Lat Kesimpulan.py` open. The code prints a message about the conclusion of the Gauss-Seidel method. The terminal output shows the execution results, including the message and the solution values for x, y, and z.

```
1 message = 'Kesimpulan dari Gauss Jordan dan Sidel'
2 print ("Updated String :-", message[:0] + 'sama-sama dapat menyelesaikan sistem pen')
```

Terminal Output:

```
-1.9599
5 -10.6598 -12.8800
-1.9600
Open file in editor (ctrl + click) ,8800
-1.9600
Solusi: x=-10.660, y=-12.880 and
z = -1.960
Input Toleransi error: & C:/Users
/Reja/AppData/Local/Programs/Pyth
on/Python38/python.exe "c:/Users/
Reja/Downloads/Lat Kesimpulan.py"
Traceback (most recent call last)
: File "d:/MetNum/latihangaussei
del.py", line 52, in <module>
e = float(input('Input Tola
nsi error: '))
ValueError: could not convert str
ing to float: '& C:/Users/Reja/Ap
pData/Local/Programs/Python/Pytho
n38/python.exe "c:/Users/Reja/Dow
nloads/Lat Kesimpulan.py"'
PS D:\MetNum> & C:/Users/Reja/App
Data/Local/Programs/Python/Python
38/python.exe "c:/Users/Reja/Dow
nloads/Lat Kesimpulan.py"
Updated String :- sama-sama dapat
menyelesaikan sistem penelasaia
n linier hanya saja gauss-jordan
masih menggunakan matriks sedangk
an gauss-sidel lebih efisien.
PS D:\MetNum>
```