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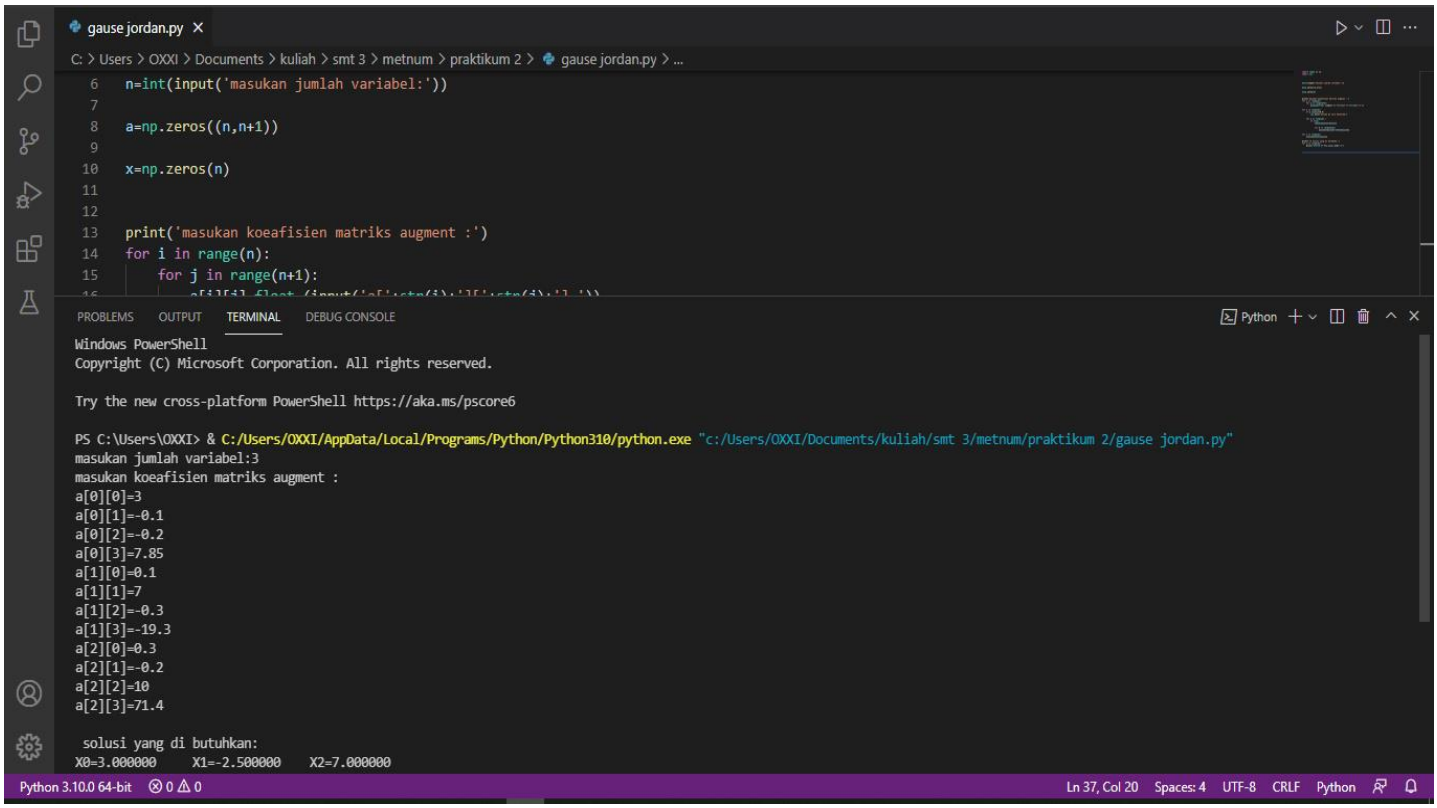
TUGAS PRAKTIKUM 2

CONTOH

1. GAUS JORDAN

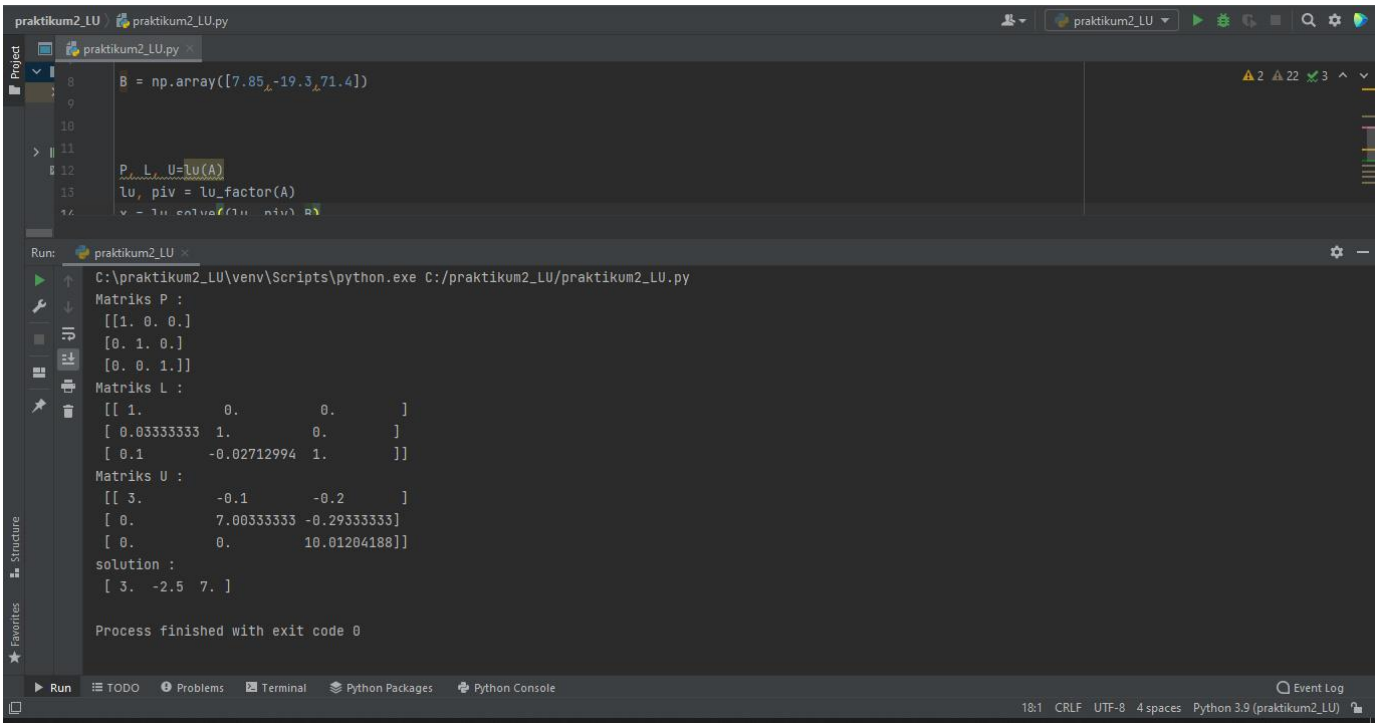
```
import numpy as np
import sys


n=int(input('masukan jumlah variabel:'))

a=np.zeros((n,n+1))

x=np.zeros(n)

print('masukan koeafisien matriks augment :')
for i in range(n):
    for j in range(n+1):
        a[i][j]=float (input('a['+str(i)+']['+str(j)+']='))

for i in range(n):
    if a [i][i]==0.0:
        sys.exit('divide by zero detected')

    for j in range(n) :
        if i!=j:
            ratio=a[j][i]/a[i][i]

            for k in range(n+1):
                a[j][k]=a[j][k]-ratio*a[i][k]

for i in range(n):
    x[i]=a[i][n]/a[i][i]

print('\n solusi yang di butuhkan:')
for i in range(n):
    print('X%d=%0.6f'%(i,x[i]),end='\t')
```

33.



2. LU

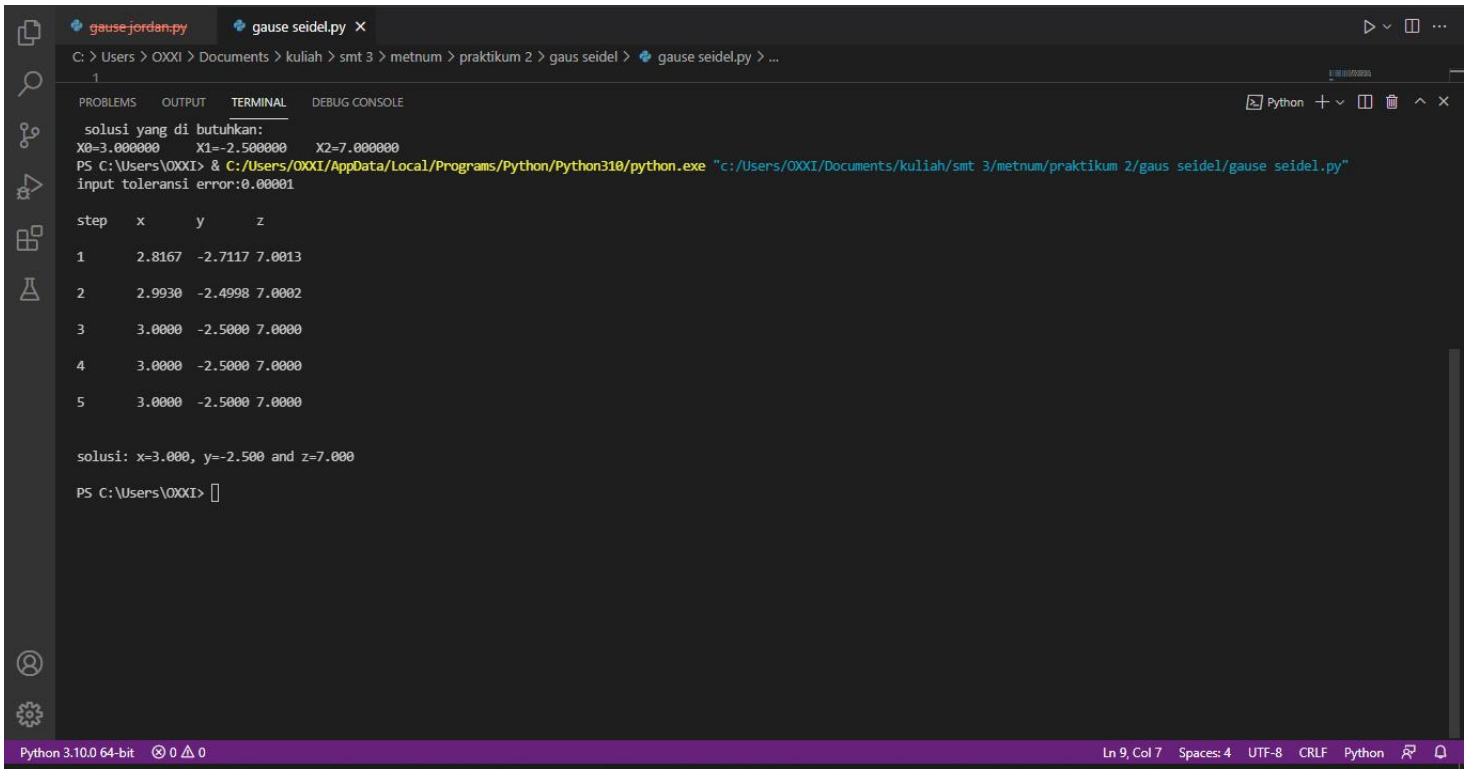
```
import scipy
from scipy.linalg import lu, lu_factor, lu_solve
import numpy as np


A = np.array([[3.,-0.1,-0.2],[0.1,7.,-0.3],[0.3,-0.2,10]])

B = np.array([7.85,-19.3,71.4])



P, L, U=lu(A)
lu, piv = lu_factor(A)
x = lu_solve((lu, piv),B)
print ('Matriks P :\n',P)
print ('Matriks L :\n',L)
print ('Matriks U :\n',U)
print ('solution :\n',x)
```



3. GAUSE SEIDEL

```
f1 = lambda x,y,z:(7.85+0.1*y+0.2*z)/3
f2 = lambda x,y,z:(-19.3-0.1*x+0.3*z)/7
f3 = lambda x,y,z:(71.4-0.3*x+0.2*y)/10

x0=1
y0=2
z0=2
step=1

e=float(input('input toleransi error:'))

print('\nstep\tx\ty\tz\n')

condition = True

while condition:
    x1 = f1 (x0,y0,z0)
```

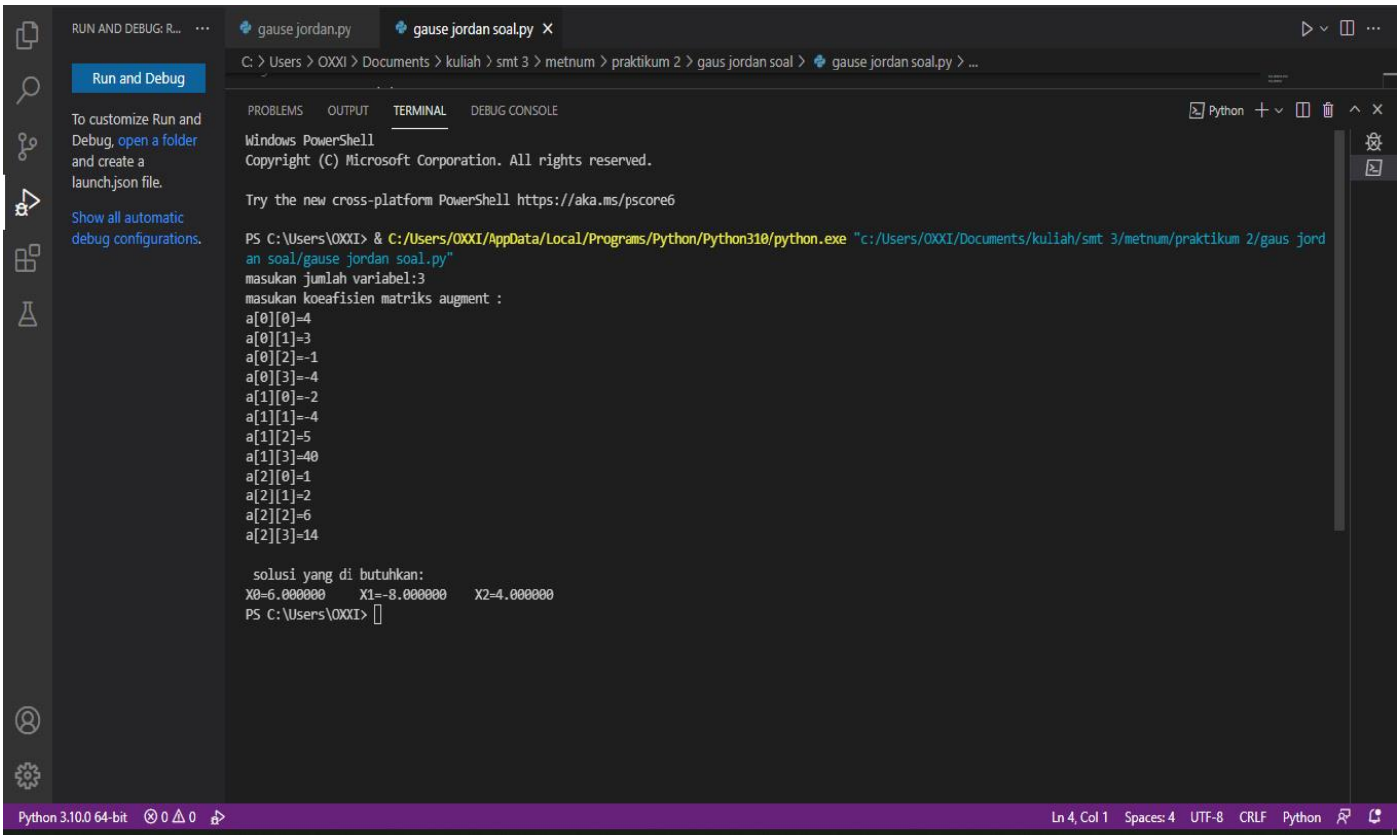
```
    y1 = f2 (x1,y0,z0)
    z1 = f3 (x1,y1,z0)
    print('%d\t%0.4f\t%0.4f\t%0.4f\n'%(step, x1,y1,z1))
    e1 = abs(x0 - x1);
    e2 = abs(x0 - y1);
    e3 = abs(x0 - z1);

    step+=1
    x0 = x1
    y0 = y1
    z0 = z1

    condition = e1>e and e2>e and e3>e
print('\nsolusi: x=%0.3f, y=%0.3f and z=%0.3f\n'%(x1,y1,z1))
```



SOAL LATIHAN

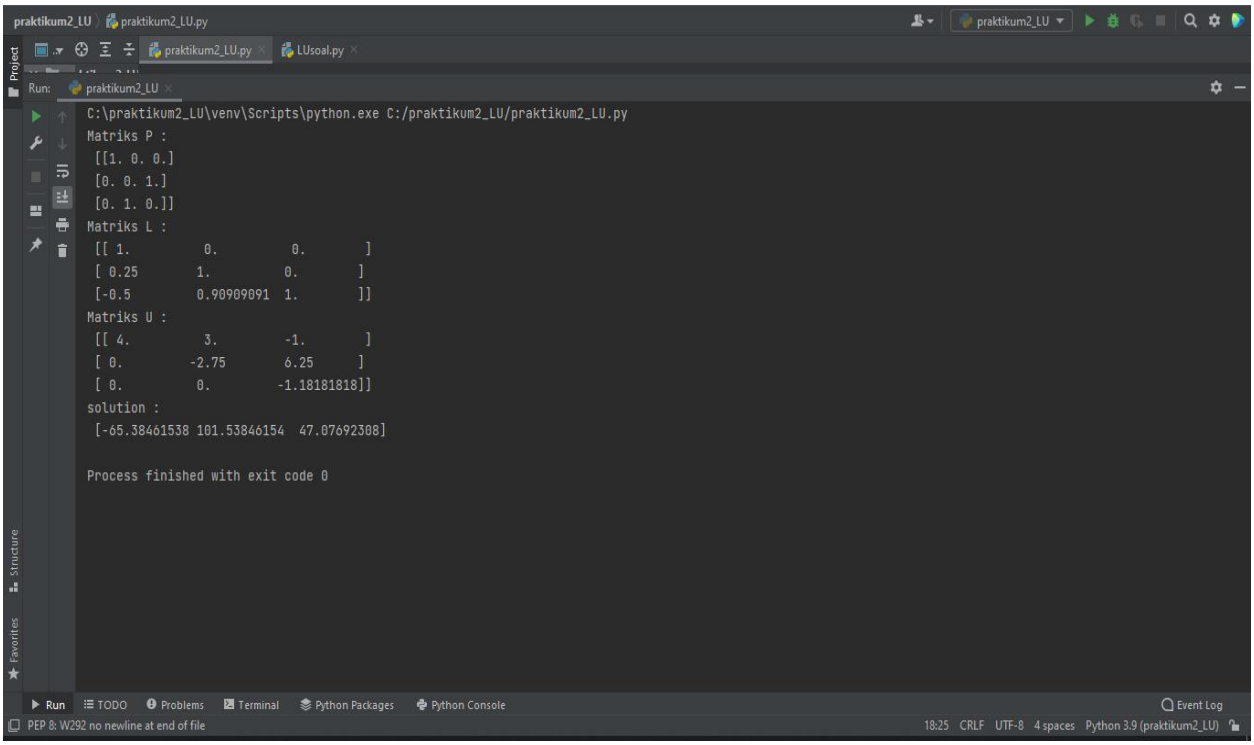
1. GAUSE JORDAN

```
import numpy as np
import sys


n=int(input('masukan jumlah variabel:'))

a=np.zeros((n,n+1))

x=np.zeros(n)

print('masukan koeafisien matriks augment :')
for i in range(n):
    for j in range(n+1):
        a[i][j]=float (input('a['+str(i)+']['+str(j)+']='))

for i in range(n):
    if a [i][i]==0.0:
        sys.exit('divide by zero detected')

    for j in range(n) :
        if i!=j:
            ratio=a[j][i]/a[i][i]

            for k in range(n+1):
                a[j][k]=a[j][k]-ratio*a[i][k]

for i in range(n):
    x[i]=a[i][n]/a[i][i]

print('\n solusi yang di butuhkan:')
for i in range(n):
    print('X%d=%0.6f'%(i,x[i]),end='\t')
```



2. LU

```
import scipy
from scipy.linalg import lu, lu_factor, lu_solve
import numpy as np


A = np.array([[4.,3,-1],[-2,-4,5],[1,-2,6]])

B = np.array([-4,-40,14])



P, L, U=lu(A)
lu, piv = lu_factor(A)
x = lu_solve((lu, piv),B)
print ('Matriks P :\n',P)
print ('Matriks L :\n',L)
print ('Matriks U :\n',U)
print ('solution :\n',x)
```



3.GAUSE SEIDEL

```
f1 = lambda x,y,z:(-4+3*y+-1*z)/4
f2 = lambda x,y,z:(40+-2*x+5*z)/-4
f3 = lambda x,y,z:(14+1*x+2*y)/6

x0=1
y0=2
z0=2
step=1

e=float(input('input toleransi error:'))

print('\nstep\tx\ty\tz\n')

condition = True

while condition:
    x1 = f1 (x0,y0,z0)
    y1 = f2 (x1,y0,z0)
    z1 = f3 (x1,y1,z0)
    print('%d\t%0.4f\t%0.4f\t%0.4f\n'%(step, x1,y1,z1))
    e1 = abs(x0 - x1);
```

```
    e2 = abs(x0 - y1);
    e3 = abs(x0 - z1);

    step+=1
    x0 = x1
    y0 = y1
    z0 = z1

    condition = e1>e and e2>e and e3>e
print('\nsolusi: x=%0.3f, y=%0.3f and z=%0.3f\n'%(x1,y1,z1))
```