from matplotlib import pyplot as plt, figure

import numpy as np

def affichage(x,y,z,e):

plt.axes(projection='3d')

for e in E:

i = e[0]

j = e[1]

plt.plot([x[i], x[j]], [y[i], y[j]], [z[i], z[j]], '-')

plt.show()

def affichage2d(x,y,e):

plt.axes(projection='2d')

for e in E:

i = e[0]

j = e[1]

plt.plot([x[i], x[j]], [y[i], y[j]], '-')

plt.show()

def remplirMatrice(P):

L=len(E)

print(L)

for i in range(L):

print()

def TG(f,e,x,y,z):

L=len(x)

Tgx=[]

Tgy=[]

for i in range(L):

Px=x[i]\*f/z[i]

Py=y[i]\*f/z[i]

Tgx.append(Px)

Tgy.append(Py)

for i in range(len(Tgx)) :

print("y", Tgy[i], "X", Tgx[i])

return [Tgx, Tgy]

def TD(f,e,x,y,z):

L=len(x)

Tdx=[]

Tdy=[]

for i in range(L):

Px=f\*(x[i]-e)/(z[i]+e)

Py=y[i]\*f/z[i]

Tdx.append(Px)

Tdy.append(Py)

for i in range(len(Tdx)) :

print("y", Tdy[i], "X", Tdx[i])

return [Tdx, Tdy]

x=1.2

y=-0.5

z=65

x=[1.2,3,4,1.8]

y=[-0.5,1.5,-1,-1.5]

z=[65,63,62,62]

#Création de points

T=np.array([[1.2,-0.5,65],[3,1.5,63],[4,-1,62],[1.8,-1.5,62]])

x=T[:,0]

y=T[:,1]

z=T[:,2]

E=np.array([[0,1],[0,2],[0,3],[1,2],[1,3],[2,3]])#Arrete

#affichage(x,y,z,E)

P=np.array([[1,-1,65],[1.8,-2,62],[4.2,-1.5,65],[1,2,65],[1.8,1,62],[4.2,1.5,65]])

x=P[:,0]

y=P[:,1]

z=P[:,2]

E=np.array([[0,1],[0,2],[0,3],[1,2],[1,4],[1,5],[2,5],[3,4],[3,5],[4,5]])#Arrete

#affichage(x,y,z,E)

#plt.plot(x,y,z,'-r',LineWidth=1)

#=======================================

#Transformée

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f=40

e=7

T=np.array([[1.2,-0.5,65],[3,1.5,63],[4,-1,62],[1.8,-1.5,62]])

x=T[:,0]

y=T[:,1]

z=T[:,2]

T\_g = TG(f,e,x,y,z)

T\_d = TD(f,e,x,y,z)

print(T\_d)

plt.plot(T\_d[0], T\_d[1], 'ro')

plt.show()