Page Rank Assignment

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```
import numpy as np

# define matrix A
A = np.array([[-1, 0, 0, 1/3], [1/2, -1, 0, 1/3], [1/2, 1/2, -1, 1/3], [0, 1/2, 1, -1],
[1, 1, 1, 1]])

#define matrix B
B = np.array([0, 0, 0, 0, 1])

# use least squares to minimise residual error and calculate one possible solution
sol= np.linalg.lstsq(A, B)
print('W = ',sol[0][0])
print('X = ',sol[0][1])
print('Y = ',sol[0][2])
print('Z = ',sol[0][3])

# verify the solution by checking r=w*r
sol_transpose = np.array([[0.12903226],  [0.19354839], [0.29032258], [0.38709677]])
Acopy = np.array([[0, 0, 0, 1/3], [1/2, 0, 0, 1/3], [1/2, 1/2, 0, 1/3], [0, 1/2, 1, 0]])
print("\n\nVerification r=w*r\n\n",Acopy,"\n*\n",tra,"\n=\n",np.dot(Acopy,sol_transpose))
```

```
>>> runfile('C:/Users/Samarjoy Pandit/Desktop/pagerank.py', wdir='C:/Users/Samarjoy Pandi
t/Desktop')
W =  0.129032258065
X =  0.193548387097
Y =  0.290322580645
Z =  0.387096774194


Verification r=w*r

 [[ 0.          0.          0.          0.33333333]
 [ 0.5         0.          0.          0.33333333]
 [ 0.5         0.5         0.          0.33333333]
 [ 0.          0.5         1.          0.        ]]
*
 [[ 0.12903226]
 [ 0.19354839]
 [ 0.29032258]
 [ 0.38709677]]
=
 [[ 0.12903226]
 [ 0.19354839]
 [ 0.29032258]
 [ 0.38709678]]
>>>
```