

```

1  # EXERCISE 2
2
3  import numpy as np
4  import scipy as sp
5  import matplotlib.pyplot as plt
6
7  # Generate vector with random entries
8  x = np.random.rand(100)
9  # set random entries in the vector to 0
10 for i in np.nditer(x,op_flags=["readwrite"]):
11     if (np.random.randint(4)) == 1:
12         i[...] = 0
13     else:
14         continue
15 # define pnorms
16 pnorm = [1,2,3,10,100,np.inf]
17 pnormvalues = []
18 # apply pnorms to the vector using np.linalg.norm
19 for i in range(len(pnorm)):
20
21     pnormvalues.append(np.linalg.norm(x,ord=pnorm[i]))
22
23 print '%0.4f & %0.4f & %0.4f & %0.4f & %0.4f & %0.4f'
    • (pnormvalues[0],pnormvalues[1],pnormvalues[2],pnormvalues[3],pnormv
    • alues[4],pnormvalues[5])
24
25 # Set new pnorm values
26 pnormvaluesp = []
27 pnormp = [0.5,0.1,0.01,0.001]
28 # apply pnorms to vector
29 for i in range(len(pnormp)):
30
31     pnormvaluesp.append(sum(x**pnormp[i]))
32
33 print '%0.4f & %0.4f & %0.4f & %0.4f '
    • (pnormvaluesp[0],pnormvaluesp[1],pnormvaluesp[2],pnormvaluesp[3])
34
35 # find out how many entries in vector x are non zero
36 indicies = np.nonzero(x)
37 print np.shape(indicies)[1]
38

```