

Note that for the following examples we have used Python 2.7.

Each of the files “refine_mats_d3.pkl”, “refine_mats_d4.pkl”, “refine_mats_d5.pkl” and “refine_mats_d7.pkl” contains a list of sublists with each sublist containing two numpy arrays, the lower and upper bound matrices of the random symmetric interval matrix. These matrices can be view as shown in figure 1,

Figure 1

```
In [1]: import pickle
In [2]: data = pickle.load( open("refine_mats_d3.pkl" , "rb") )
In [3]: data[0][0]
Out[3]:
array([[ 5.06809584,  3.66635791,  9.48614116],
       [ 3.66635791, -5.22575929,  6.37857932],
       [ 9.48614116,  6.37857932, -3.30862073]])
In [4]: data[0][1]
Out[4]:
array([[ 9.77275151,  6.32697371,  9.72831966],
       [ 6.32697371, -1.66137148,  8.35912533],
       [ 9.72831966,  8.35912533, -1.09404031]])
In [5]: █
```

Each of the rest of the files contains a list of sublists with each sublist containing two numpy arrays (lower and upper bound matrices of the interval Hessian) and another list with the bounds of the corresponding domain over which the interval Hessian was calculated. These data can be viewed as shown in figure 2,

Figure 2

```
In [1]: import pickle

In [2]: data = pickle.load( open("refine_himm_r1.pkl" , "rb") )

In [3]: data[0][0]
Out[3]:
array([[ 168.83263579,  -6.77806748,   26.9409405 ,   3.49377155,
         1.1246976 ],
       [ -6.77806748,  159.85245628,  -1.61174622, -25.05891516,
        -27.42798912],
       [  26.9409405 ,  -1.61174622,  613.22297587,   8.66009282,
         6.29101886],
       [   3.49377155, -25.05891516,   8.66009282, -113.00905447,
        -17.15615009],
       [   1.1246976 , -27.42798912,   6.29101886, -17.15615009,
        53.50495608]])

In [4]: data[0][1]
Out[4]:
array([[ 630.95845211,   6.31299578,  32.40921604,  14.7685802 ,
         9.14501545],
       [   6.31299578,  807.82466037,   6.02741641, -11.61321943,
        -17.23678419],
       [  32.40921604,   6.02741641,  635.47782007,  14.48300082,
         8.85943607],
       [  14.7685802 , -11.61321943,  14.48300082,  59.16564719,
        -8.78119977],
       [   9.14501545, -17.23678419,   8.85943607, -8.78119977,
        202.72177709]])

In [5]: data[0][2]
Out[5]:
[[ 2.7218274042792765,  4.0868494270061415],
 [ -4.416344274645833, -2.5086004807914017],
 [  4.013407720371469,  4.015454582115409],
 [ -1.8483845161347188, -0.3947043765223053],
 [ -2.4406530055063707, -1.8005955654950911]]
```