IDAPI Coursework 2 - HepatitisC data set

Sebastian Grubb sg3510@ic.ac.uk

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1 Results

```
Dependency Matrix
[[  0.00e+00   4.46e-02   2.57e-02   4.80e-02   3.40e-02   2.37e-02   3.91e-02   8.61e-02   1.57e-02]
 [  4.46e-02   0.00e+00   9.39e-03   6.04e-02   6.88e-02   3.03e-02   7.14e-02   8.26e-02   2.66e-03]
 [  2.57e-02   9.39e-03   0.00e+00   1.17e-02   7.15e-03   1.56e-03   7.02e-03   4.91e-03   5.18e-04]
 [  4.80e-02   6.04e-02   1.17e-02   0.00e+00   5.39e-01   2.75e-01   3.16e-02   3.24e-02   5.77e-03]
 [  3.40e-02   6.88e-02   7.15e-03   5.39e-01   0.00e+00   6.06e-01   4.06e-02   5.05e-02   8.40e-03]
 [  2.37e-02   3.03e-02   1.56e-03   2.75e-01   6.06e-01   0.00e+00   2.51e-02   4.14e-02   1.61e-02]
 [  3.91e-02   7.14e-02   7.02e-03   3.16e-02   4.06e-02   2.51e-02   0.00e+00   6.29e-02   3.85e-03]
 [  8.61e-02   8.26e-02   4.91e-03   3.24e-02   5.05e-02   4.14e-02   6.29e-02   0.00e+00   3.20e-02]
 [  1.57e-02   2.66e-03   5.18e-04   5.77e-03   8.40e-03   1.61e-02   3.85e-03   3.20e-02   0.00e+00]]
```

Note that the diagonal is set to 0 intentionally as this facilitates all calculations and is consistent with $D(p||p) = 0$ [1].

```
 Dependency List
[[  6.06e-01    4     5]
 [  5.39e-01    3     4]
 [  2.75e-01    3     5]
 [  8.61e-02    0     7]
 [  8.26e-02    1     7]
 [  7.14e-02    1     6]
 [  6.88e-02    1     4]
 [  6.29e-02    6     7]
 [  6.04e-02    1     3]
 [  5.05e-02    4     7]
 [  4.80e-02    0     3]
 [  4.46e-02    0     1]
 [  4.14e-02    5     7]
 [  4.06e-02    4     6]
 [  3.91e-02    0     6]
 [  3.40e-02    0     4]
 [  3.24e-02    3     7]
 [  3.20e-02    7     8]
 [  3.16e-02    3     6]
 [  3.03e-02    1     5]
 [  2.57e-02    0     2]
 [  2.51e-02    5     6]
 [  2.37e-02    0     5]
 [  1.61e-02    5     8]
 [  1.57e-02    0     8]
 [  1.17e-02    2     3]
 [  9.39e-03    1     2]
 [  8.40e-03    4     8]
 [  7.15e-03    2     4]
 [  7.02e-03    2     6]
 [  5.77e-03    3     8]
```
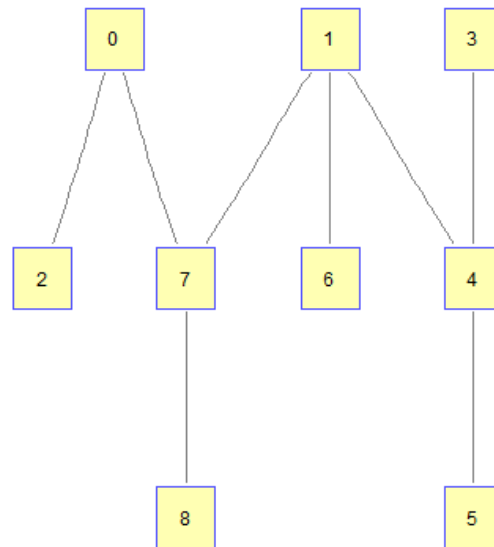
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[1] http://www.cs.princeton.edu/courses/archive/fall11/cos597D/L03.pdf

```
[  4.91e-03   2   7]
[  3.85e-03   6   8]
[  2.66e-03   1   8]
[  1.56e-03   2   5]
[  5.18e-04   2   8]]
 Spanning Tree
[[ 0.61   4   5]
 [ 0.54   3   4]
 [ 0.09   0   7]
 [ 0.08   1   7]
 [ 0.07   1   6]
 [ 0.07   1   4]
 [ 0.03   7   8]
 [ 0.03   0   2]]
```

2   Graph

Figure 1: Graph of Hepatitis C dependency

Nodes on top are not necessarily meant to be root nodes this is simply the way `matlab`'s biograph function outputs the graph.

3   Dependency Matrix with diagonal

```
Dependency Matrix
[[  1.53e+00   4.46e-02   2.57e-02   4.80e-02   3.40e-02   2.37e-02   3.91e-02   8.61e-02   1.57e-02]
 [  4.46e-02   2.37e+00   9.39e-03   6.04e-02   6.88e-02   3.03e-02   7.14e-02   8.26e-02   2.66e-03]
 [  2.57e-02   9.39e-03   9.92e-01   1.17e-02   7.15e-03   1.56e-03   7.02e-03   4.91e-03   5.18e-04]
 [  4.80e-02   6.04e-02   1.17e-02   1.70e+00   5.39e-01   2.75e-01   3.16e-02   3.24e-02   5.77e-03]
 [  3.40e-02   6.88e-02   7.15e-03   5.39e-01   2.41e+00   6.06e-01   4.06e-02   5.05e-02   8.40e-03]
 [  2.37e-02   3.03e-02   1.56e-03   2.75e-01   6.06e-01   1.83e+00   2.51e-02   4.14e-02   1.61e-02]
 [  3.91e-02   7.14e-02   7.02e-03   3.16e-02   4.06e-02   2.51e-02   2.63e+00   6.29e-02   3.85e-03]
 [  8.61e-02   8.26e-02   4.91e-03   3.24e-02   5.05e-02   4.14e-02   6.29e-02   1.49e+00   3.20e-02]
 [  1.57e-02   2.66e-03   5.18e-04   5.77e-03   8.40e-03   1.61e-02   3.85e-03   3.20e-02   7.54e-01]]
```