Data visualisation
Assignment 4.2.b

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2.a) Comparison of node-link and matrix graph visualization techniques[1] :

1) Estimation of number of nodes

   The readability of the node link diagram reduces significantly as the size of the graph is increased whereas there is negligible effect of size on matrix based representation. If we talk in terms of link density the node link diagram is slightly affected by the increase in link density whereas there is no effect of link density on matrix based representation.
   Matrix based representation is better if the size and link density are medium or large.

2) Estimation of number of links

If the graph size is small, matrix based representations performs better the node link diagram. If the graph size is medium, matrix representations performs better than node link diagram though the difference is not significantly high and if the graph size us large matrix based representations again performs better.

3) Finding a specified node

When considering answer time, we can see that the readability of node-link diagrams deteriorate quickly when the size of the graph increases and are moderately affected by link density, whereas the answer time on the matrix-based representation deviates a little when the size increases and does not seem to be affected at all by link density. Where as in the case of small graph both perform equally well.

4) Finding a link between two nodes

The larger the graph the longer it will take for node link representation to look for a link. Where as matrix based representation does not depend on size and density of the graph. For larger graphs and for medium or high link density, matrix based representation performs better than node link based representations whereas for small graphs .node link representations performs better than matrix based representations.

References

[1] Ghoniem, Mohammad & Fekete, Jean-Daniel & Castagliola, Philippe. (2005). On the Readability of Graphs Using Node-Link and Matrix-Based Representations: A Controlled Experiment and Statistical Analysis. Information Visualization Journal. 4. 10.1057/palgrave.ivs.9500092.