Latex Template

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1 Statement

We've been given the following problem to talk about.

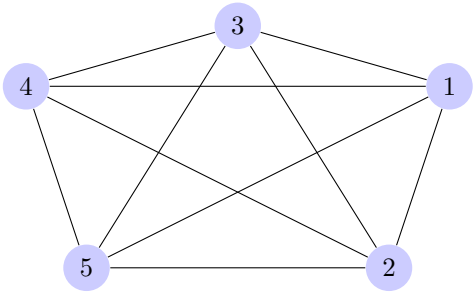
Minimum cut linear arrangement

Given a graph $G = (V, E)$, compute a one-to-one function $f : V \to [1..|V|]$ so that the maximum number of cut edges in any integer point is minimised, i.e.

$$\max_{i \in 1..|V|} |\{\{u, v\} \in E : f(u) \leq i < f(v)\}|$$

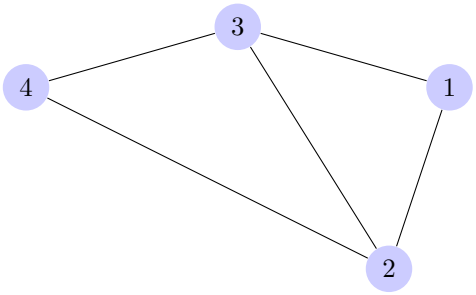
i. Example Instances

The problem instances are Graphs G. As an example, we take $G = K_5$:



Here, every node is connected to every one of the rest. Therefore, every node is identical to every one else. In this case, every assignment of numbers $1 \ldots n$ to the nodes yields the same graph. Therefore to solve this instance, we consider a random labeling of our nodes, and we compute the cuts at all integer points between 1 and n.

Another instance, could be this graph.



Here, the assignment matters, and one possible solution could be: f(1)=1, f(2)=2, f(3)=4, f(4)=3. This was found using exhaustive search. However, in order to attack the problem in a more intuitive manner, it would be more suitable to have visualize the problem as follows: Given graph G, create a drawing of G such that the nodes are placed on a straight horizontal line. The objective is to minimize the maximum number of edges that exist in the space between two consecutive nodes.

TODO: FIX GRAPH BELOW