Link Prediction

Instructions:
Please read the included paper that describes a structural perturbation method (SPM) for link prediction/missing links detection that is based on perturbation of the observed network adjacency matrix. The objective of this problem is to implement the described algorithm, and to test it on the included network. Specifically, please do the following:

- Write the code implementing the SPM algorithm either in Python or in C/C++.
- Run this algorithm on a provided white-space-separated edge list of the network, and assign SPM scores to each non-link. Please use 10 repetitions for SPM and choose 10% of existing links as a perturbation set.
- Use true missing links specified in a separate file to label all ranked non-links as true/false positives, and compute the areas under the Receiver Operator Characteristic (AUROC) and Precision-Recall (AUPR) curves as the performance scores of the SPM for link prediction in the network.

Note that your code should only return these two numbers (areas under ROC and PR curves), and take as an input the pruned edge list and the list of true missing links. For AUROC/AUPR calculations, it is allowed to use available packages such as Scikit-Learn.

Completed Assignment:
is a zipped file which includes:

- The source code with comments that are as detailed as possible, so that one can easily check the code.
- A detailed README file which contains compiling instructions, required packages/libraries, usage notes or any other information that you feel need to be communicated to the user.
- The AUROC and AUPR values computed using this code applied to the network.