Discrete Mathematics, CSE 121 : Programming Project

General Instructions:

(a) Maximum marks = 8.

(b) This is an individual project. Therefore,

  (a) Copying any code either fully or partially from any source is a case of plagiarism. Please refer to the Academic Dishonesty Policy of the institute.

  (b) You can discuss the project with a classmate, however, similarities in your codes is considered plagiarism. Please refer to the Academic Dishonesty Policy of the institute.

Project Description:

Generate an undirected graph in the popular Stanford Network Analysis Platform (SNAP) format. For this purpose, you can, for example, use the python module snap.py as given here `https://snap.stanford.edu/snappy/`. If you use snap.py, you can quickly check out the input/output format of the graphs as given on the same page here `https://snap.stanford.edu/snappy/#input`. Given a graph in SNAP format (as saved by yourself in a text file after generating it), implement a program in Python/Java to do the following

1. First check if the graph is connected. [1 mark]
2. Then check if the graph contains a cycle. [2 marks]
3. If the graph is connected and has a cycle, check if it contains a Hamiltonian cycle. [4 marks]
4. Use the graph builder to generate the Petersen graph, see Figure 1.

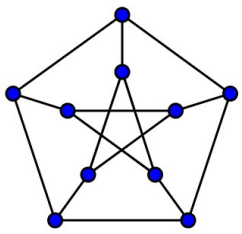

Figure 1: Petersen graph

   Use your program to prove that Petersen graph does not contain a Hamiltonian cycle. [1 mark]

You are not supposed to use any module/library from any source in your program after generating a graph.