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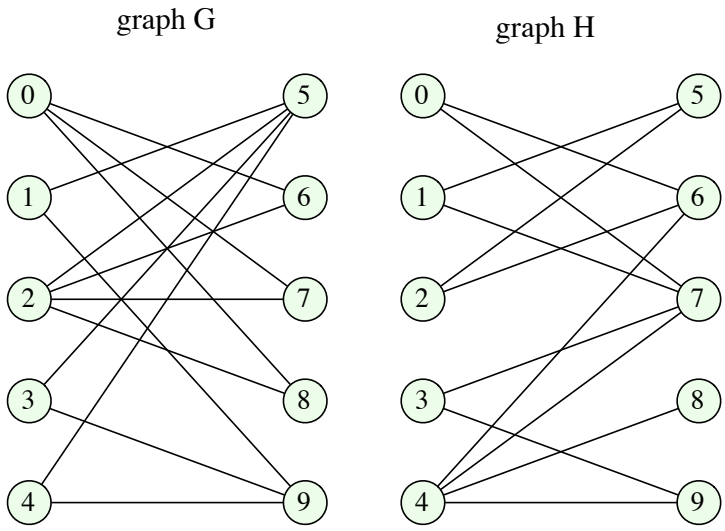
CS 111 ASSIGNMENT 5
due June 3

Problem 1: You are given two bipartite graphs G and H below. For each graph determine whether it has a perfect matching. Justify your answer, either by listing the edges that are in the matching or using Hall's Theorem to show that the graph does not have a perfect matching.



Solution 1:
Graph G: Impossible, cannot have perfect matching;
Note, 4 can only match to 5 or 9
Note, 3 can only match to 5 or 9
Note, 1 can only match to 5 or 9
SO, 4, and 3, and 1 can only match to 5 or 9, we cannot have perfect match with this.
Thus, graph G does not have perfect matching

Graph H: Yes, it has perfect matching;
here is a perfect set:
4 matches with 8,
3 matches with 9,
2 matches with 6,
1 matches with 5,
0 matches with 7
Thus, graph h has perfect matching
