

GRAPH-MATCHING 1

Discussion Points

Q1: Midterm Test quick debrief (about 10m).

Q2: Back in Lecture 1, we have learned about the MIN-VERTEX-COVER (MVC) problem. In T03, we also have learned about the MAX-INDEPENDENT-SET (MIS) problem. We haven't discuss the special cases of these two problems if they are asked on *Bipartite Graph*, so we will do it now (relevant problem: <https://nus.kattis.com/problems/bilateral>).

Given a Bipartite Graph $G = (V_L, V_R), E$ of approximately 2000 vertices and up to 10 000 edges, show how to find the MVC and MIS on G by reducing those problems into Bipartite Matching and further reduce them into Max Flow problems.

Follow up question: What if the MVC/MIS problems asked are the weighted variants?

Q3: Find the underlying (bipartite, that is a major hint) graph in this (graph matching, that is another major hint) problem: <https://onlinejudge.org/external/6/670.pdf>.

Q4: (Time permitting): Discuss the solution for <https://open.kattis.com/problems/flippingcards>. Is it NP-hard? (or special case of an NP-hard problem?) What algorithm that you will use to solve it.