Solution

Given a proposed solution to MI Sched, we can check that it is of size k and that no two intervals overlap, so we have shown that this problem is in NP.

We want to produce a disjoint set of elements so we will use Independent Set and show that $Indp.Set <_p M.I.Sched$. To do this, we will transform an instance of Independent Set (G, k) into an instance of M.I.Sched $((n, O_1, ...O_i), k)$ where n is the number of jobs that we have each O_i is a pair of jobs that happen at the same time. Given our graph G we imagine each vertex in G as a job n, and each edge in G connecting jobs that overlap. So our answer to M.I.Sched becomes a set of vertices in G that do not share an edge. When we have an independent set in G of size k we have a solution to M.I.Sched of size k and when we do not have such an independent set, we do not have a solution to M.I.Sched.