Exercise sheet 11

COMP6741: Parameterized and Exact Computation

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Exercise 1. Show that Path Packing has no polynomial kernel unless NP $\subseteq$ coNP/poly.

Path Packing	
Input:	A graph G and an integer k
Parameter:	k
Question:	Are there k pairwise vertex-disjoint paths of length at least k each?

Exercise 2. An *endpoint* of a path is a vertex that has degree at most 1 in the path. Consider the NP-complete Anchored Path problem.

Anchored Path	
Input:	A graph $G = (V, E)$, a vertex $r \in V$, and an integer $k \leq \|V\|$
Parameter:	k
Question:	Does G have a path on k vertices as a subgraph such that r is an endpoint of that path?

Prove that Anchored Path has no polynomial kernel unless coNP $\subseteq$ NP/poly.