1. Recall problems Independent Set (IS) and Vertex Cover (VC) from last time. Suppose that the *parameter* of both problems is the solution size. Formally, we have defined problems Independent Set *parameterized by solution size k* and Vertex Cover *parameterized by solution size k* but I will always omit the part after the "parameterized" if what I mean is clear from the context.

   On the lecture (I hope) you saw that VC is in FPT and IS is W[1]-hard. This indicates that IS is probably not in FPT. But we have seen a polynomial reduction from IS to VC. You can trust me that a polynomial reduction is a FPT reduction. Should this not mean that IS is also in FPT? Discuss.

2. In the Point Line Cover problem, we are given a set of n points in the plane and an integer k. The goal is to check if there exists a set of k lines on the plane that contain all the input points. Show a kernel for this problem with $\mathcal{O}(k^2)$ points.

3. Show that Clique and Independent Set, parameterized by the solution size k, are FPT on r-regular graphs for every fixed integer r. r being a fixed constant means that we can assume $r \in \mathcal{O}(1)$.

   Also show that these problems are FPT with combined parameters $k+r$. Meaning that r is not a constant anymore and we need to consider it in the running time of the algorithm.

Homework should start next week :)