Tutorial 3
Advanced Graph Theory

14^{th} August 2014

1. Use the Konig-Egervary Theorem to prove that every bipartite graph G has a matching of size at least $e(G)/\Delta(G)$. Use this to conclude that every subgraph of $K_{n,n}$ with more than $(k-1)n$ edges has a matching of size at least k.
2. Determine the maximum number of edges in a simple bipartite graph that contains no matching with k edges and no star with l edges. (Isaak)
3. Let G be a simple graph in which the sum of the degrees of any k vertices is less than $(n-k)$. Prove that every maximal independent set in G has more than k vertices.