Tutorial 8
Advanced Graph Theory

13^{th} October 2014

1. If $\delta(G) \geq n-2$ for a simple n-vertex graph G , then $\kappa(G) = \delta(G)$. Prove that this is best possible for each $n \geq 4$ by constructing a simple n-vertex graph with minimum degree n-3 and connectivity less than $n-3$.
2. Prove that Ford-Fulkerson's CSDR Theorem implies Hall's Theorem.
3. Use Menger's Theorem($\kappa(x,y) = \lambda(x,y)$ when xy $\notin$ E(G)), to prove the Konig-Egervary Theorem.
4. Using Menger's Theorem, show that $\kappa(G) = \kappa'(G)$ when G is 3-regular. [Hint: First use the analogue Theorem developed from Menger's Theorem: *If x and y are distinct vertices of a graph G, then the minimum size of an x,y-disconnecting set of edges equals the maximum number of pairwise edge-disjoint x,y-paths.*. Then use Menger's Theorem.]