1. **[10 Points] Trying out the Network Flow Algorithm!** CLRS, Exercise 26.2-2 (page 663). Note that the “Edmonds-Karp Algorithm” is just the algorithm we did in class (called “Ford-Fulkerson”) but using breadth-first search (rather than depth-first search) to find augmenting paths. In your solution, show both the augmenting path and the residual network after each iteration as on page 659.

2. **[20 Points] Review of Network Flow Proofs.** In class we proved four fundamental theorems which, in the end, allowed us to show that our network flow algorithm does indeed find a maximum flow from $s$ to $t$. These four theorems were:

   (a) The Cut Theorem  
   (b) The Capacity Theorem  
   (c) The Max-Flow Min-Cut Theorem  
   (d) The “Greed is Good” Theorem for Network Flows

Note that our proofs and approach are easier than those given in the book. Your task is to carefully write out the proofs of each of these four theorems as presented in class. Your grade will be based largely on how clearly and precisely you write your proofs.