**Q1 .** The knapsack problem is as follows: given a set of integers S = {s_1, s_2, . . . , s_n}, and a target number T, find a subset of S which adds up exactly to T. For example, there exists a subset within S = {1,2,5,9,10} that adds up to T = 22 but not T = 23.  
Find counterexamples to each of the following algorithms for the knapsack problem. That is, giving an S and T such that the subset is selected using the algorithm does not leave the knapsack completely full, even though such a solution exists.  
(a) Put the elements of S in the knapsack in left to right order if they fit, i.e. the first-fit algorithm.  
(b) Put the elements of S in the knapsack from smallest to largest, i.e. the best-fit algorithm.  
(c) Put the elements of S in the knapsack from largest to smallest.  
**Solution:**  
(a) S = {1, 2}, T = 2  
(b) S = {1, 2}, T = 2  
(c) S = {2, 3, 4}, T = 5