Solve the following questions and submit to me latest by 15th April.

1. A shopkeeper has W marbles and n empty bottles. Let c1,c2,……,cn respectively denote the number of marbles the bottles can contain. The shopkeeper wants to store the marbles in the bottles.
    a. Describe a greedy algorithm which minimizes the number of bottles used.
    b. How would you modify your algorithm if bottle i also has an associated cost price pi and the goal is to minimize the total cost of the bottles used.
2. Will Dijkstra's algorithm still give shortest path between two vertices if the edge weights are allowed to be negative. If yes, justify your answer with an argument. If no give an example.
3. Let e be a maximum weight edge on sme cycle of G=(V,E). prove that there is a minimum spanning tree of G'=(V,E-{e}) that is also a minimum spanning tree of G. that is, there is a minimum spanning tree of G that does not include e.
4. Find the failure indexes for the following pattern:
   b a n a n a n o b a n o
5. give a scenario in which the naïve string matching algorithm demonstrates its worst case behavior.