4th tutorial

1. Most Frequent Occurence of Length k: Find which substring of length k appears the most times as a substring of σ.

2. Longest Repeated Substring: Find the longest substring of σ, which appears at least twice in σ.

3. Multiple Sources and Terminals: How to find the maximum flow in a situation when there are multiple sources and terminals?

4. Ford-Fulkerson with Unit Capacities: How many iterations does Ford-Fulkerson make if all capacities are 1?

5. Bad Net: Give an example of a small network in which the F-F algorithm may perform more than a million iterations. ("May perform" means there is a sequence of choice of augmenting paths; you may adversarily choose these.)

6. Edge Disjoint Paths: Find an algorithm which finds the maximum number of edge disjoint paths between given two vertices $u, v \in V(G)$.

7. Vertex Disjoint Paths: Find and algorithm which computes the maximum number of vertex disjoint paths between given two vertices $u, v \in V(G)$.

8. Maximum Bipartite Matching. Design an algorithm which computes the maximum size matching in a bipartite graph $G = (V, E)$. A matching is a subset of edges $M \subseteq E$ such that no two edges overlap, i.e. $\forall e_1, e_2 \in M : e_1 \cap e_2 = \emptyset$.