

CS F364
Design and Analysis of Algorithms
BITS Pilani, Hyderabad Campus
Assignment -2
Due Date : 29th April 2023 (by Midnight)
Total Marks: 45 (weightage : 15%)

Objective: In this assignment, you have to implement two algorithms

1. Ford-Fulkerson algorithm to find the maximum flow and minimum cut.

Task 1: To implement the Ford-Fulkerson Algorithm. Please note that you should not implement any other algorithm but the one explained in class. [10]

Task 2: Implement the subroutine to find the minimum *st*-cut of a network flow graph. [3]

Task 3: Use the Ford-Fulkerson algorithm for solving Bipartite Matching problem. [5]

Task 4: Run your algorithm on different kinds of network flow graph for tasks 1 and 3. Smaller graphs to test your code and larger graphs to verify the robustness of implementations. Some of the bipartite graphs can be found in Stanford repository. [6]

2. The line fitting dynamic programming algorithm (segmented least squares algorithm) done in class.

Task 5: Implementing the actual algorithm [6]

Task 6: Implement a visualization of the input and output using Python/Java. [6]

Task 7: Record your experimental results along with the documentation of algorithm. Develop HTML pages to document the results produced by your code, issues in coding, general discussion on the algorithm, timing analysis, references, and any other remarks. [6]

Task 8: Use software Doxygen to produce the code documentation. [3]

General Instructions:

1. This assignment should be done in groups. Groups of assignment-1 should not change.
2. Design the classes and headers properly. The code should be well indented, well commented and easily readable. Points will be deducted for an unorganized and uncommented code.
3. The assignment has to be coded completely in C++/Java.
4. The name of the file should be id1_DAA_A2.zip or rar file, where id1 refers to the ID of only one member of the group.
5. There should be only one submission from a group.

6. You can discuss with your friends but refrain from copying the code and submitting. Copied codes will receive no credits for the entire assignment.
7. You have to demo the code to the instructor/TA on a scheduled date and timing after submission.
- 8. During Demo all members must be present. Anybody not present will be awarded zero credit.**