

CS F364 – Design and Analysis of Algorithm
BITS Pilani, Hyderabad Campus

Assignment -1

Due Date : 16th March 2021 (by Midnight)

Total Marks: 45 (weightage : 15%)

The objective of this assignment is to read a research paper based on Divide-and-Conquer to find the measure of the union of n iso-rectangles i.e. a rectangle whose sides are aligned with coordinate axes. Experiment with many different data sets and compare results.

Exercise 1: Read the research paper “Optimal Divide-and-Conquer to Compute Measure and Contour for a Set of Iso-Rectangles” by Ralf Hartmut Guting. Implement both the algorithms for “Measure Problem” and “The Contour Problem” given in the paper. [20]

Exercise 3: Run your algorithm on different kinds of input. Use smaller test examples to test your code and larger test cases to verify the robustness of your implementation. [10]

Exercise 4: 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. [8]

Exercise 5: Use software Doxygen to produce the code documentation. [2]

Bonus Points: Show the visualization of rectangles and its contour using any visualization tool/library. You can use any language for this exercise. [5]

General Instructions:

1. This assignment can be done in groups of no more than four students.
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/C++.
4. The name of the file should be id1_DAA_A1.zip, where id1 refers to the ID of only one member of the group.
5. There should be only one submission from a group on the CMS.
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.**