

COM2031 EXAM NOTES, CONDENSED

Jim Lam

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1 Divide and Conquer

1.1 Tiling example

2^n grid tilings problem

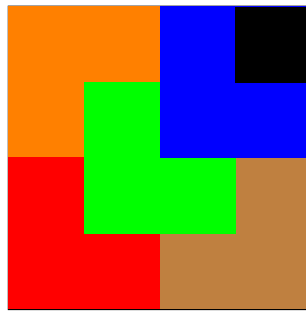


Figure 1: Example of a 4x4 grid with some tiles

1.1.1 Base case

2^1 (2x2 grid): 4 ways to tile with L-shape tiles

1.1.2 Recursive case

2^2 : Divide grid into 4 quadrants, tile each quadrant

1.2 Quicksort

Brief runthrough (add key points)

2 Graphs

2.1 Graph representation

- Adjacency matrix

- Adjacency list
- Edge list

2.2 Graph traversal

- Depth-first search (DFS)
- Breadth-first search (BFS)

2.3 Minimum spanning tree

- Kruskal's algorithm
- Prim's algorithm