

# Mobile Robots

## AUTO4508

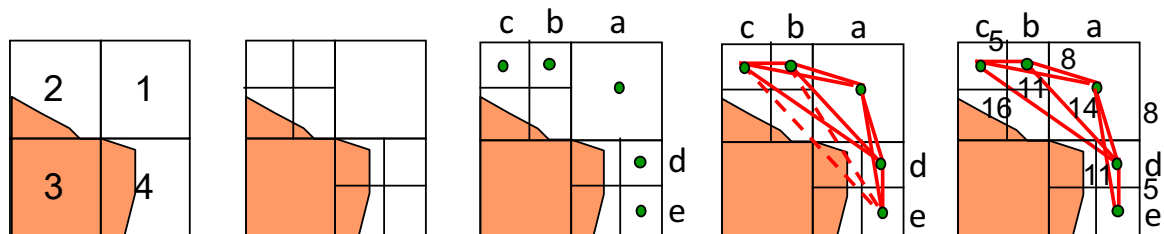
### Lab Assignment 4 – *Group* – Quadtree

Points: 10

Implement the Quadtree area decomposition algorithm for a given environment in occupancy grid format.

#### EXPERIMENT 1 (4 points)

Read and display the occupancy grid as a binary image of size 128x128 from file (1 means occupied, 0 means free).



Do a recursive subdivision of the area down to pixel-level.  
Then print the center-point coordinates of the free-space areas

#### EXPERIMENT 2 (3 points)

Determine all collision-free paths between center-points and calculate their distances

#### EXPERIMENT 3 (1 point)

Calculate and print distances of all collision-free paths (in text and graphics form)

#### EXPERIMENT 4 (2 points)

Drive the robot from start (top left) to goal (bottom right) on a collision free course, following the Quadtree free nodes. You can use any path, not necessarily the shortest path.