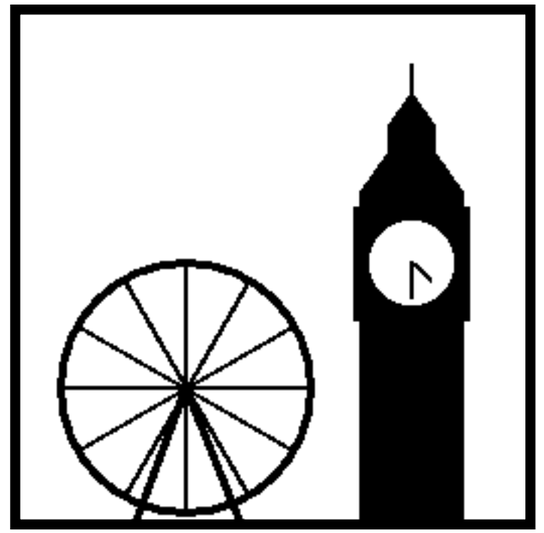
Write a program to convert a given binary image into a quad tree and serialise it to disk.

Write another program to take a serialised quad tree and turn it back into an image.

The quad tree for an image is generated by splitting the image into four quadrants then successively splitting each of these into further quadrants. When a quadrant consists of a single colour, it may be considered a terminal node.



Quad trees can be used to perform a number of common transformations on an image. Write programs to perform the following using quad tree manipulations:

- Rotate an image 90 degrees anti-clockwise
- Shrink an image by a factor of 2
- Grow an image by a factor of 2