Assignment 3
Grammatical derivation: generating a design according to the rules
Due 3.2.09

This assignment is motivated by paintings in the De Stijl style of art, of which two example images are shown, one, part of a real painting, and the other, artificially created.
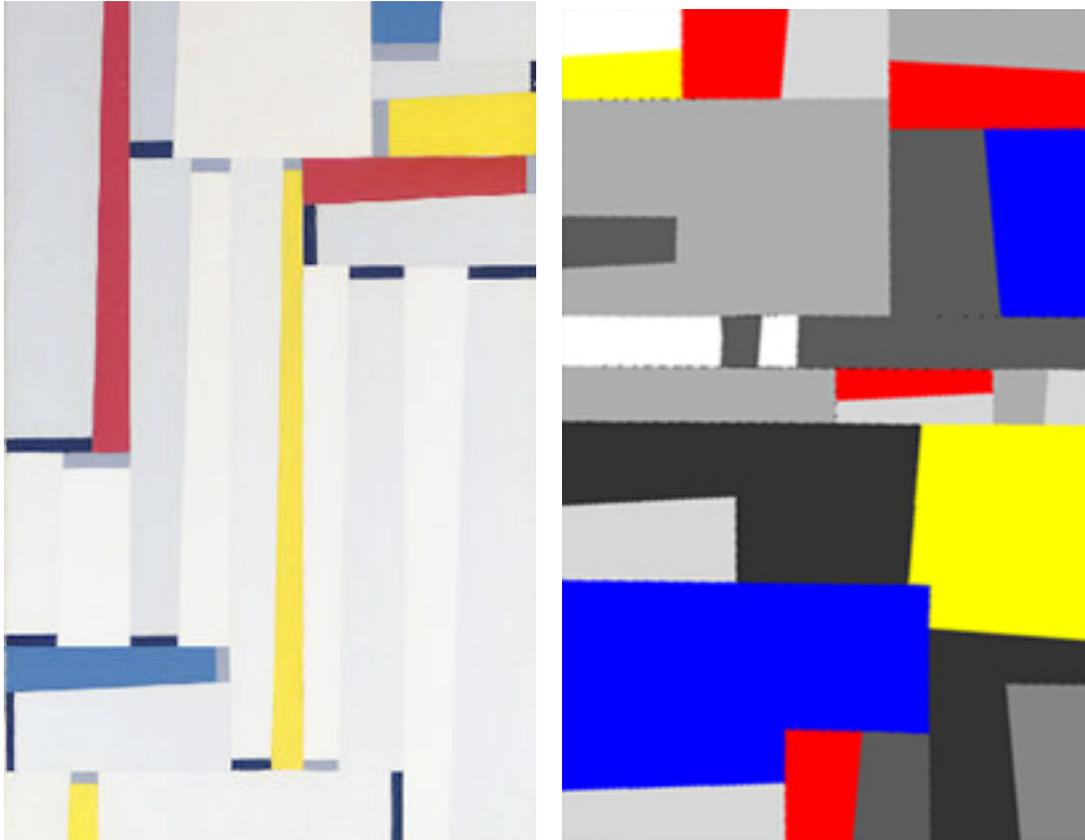
The following parametric shape grammar in normal form (perhaps incomplete) shown overleaf specifies a language of BLACK AND WHITE PAINTINGS.

MODIFY OR EXTEND the grammar so that colored paintings can be generated.

Use or invent any consistent technique you like.

Your grammar MUST OBEY the following color constraints:
   a. The colors belong to the set {scarlet, blue, yellow, black, white, light grey, dark grey}
   b. All spaces that meet at a point must have different colors.
   c. Only wedge-shaped regions are colored; rectangular spaces are colored white.
   d. If two wedge-shaped regions abut in different orientations, the border on the narrower wedge shape is colored black and the regions on either side of this border are colored the same shade of grey.
   e. The boundary line between two colored regions is erased

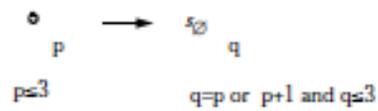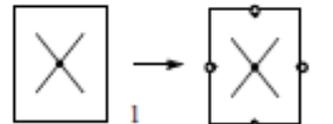ILLUSTRATE your modified grammar with an example of a colored design in its language.
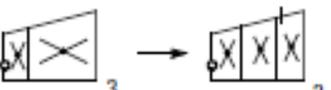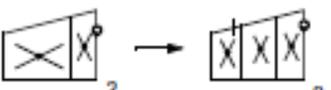
Initial shape
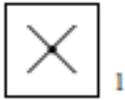
Rules for dividing rectangles

Locating pairs of rectangles to form larger rectangles

$p \leq 3$ $q=p$ or $p+1$ and $q \leq 3$

Rules for oblique divisions
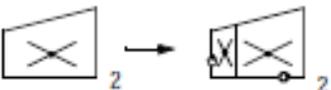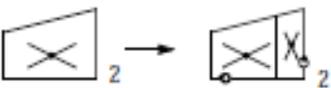
Relation between obliquely divided rectangles

Erasing rules