# Tutorial 8

Exercise 1

Let $C = \{x, y\}$ be a set of clocks such that $c_x = 2$ and $c_y = 2$.

- Draw a picture with all regions for the clocks x and y.

- How many different regions there are on the picture?

- Select four different regions (corner point, line, two areas) and describe them via extended clock constraints (i.e., also diagonal constraints like $x - y \leq 1$ etc. can be used).

- Try to find a general formula which describes the number of regions for two clocks and arbitrary maximal constants c_x and c_y.

Exercise 2*

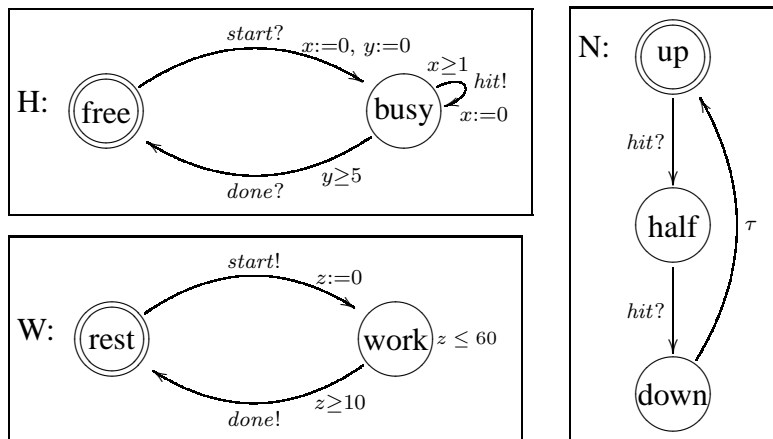Draw a region graph of the following timed automaton.
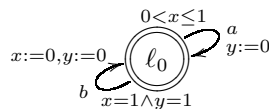
Using the region graph decide whether the following configurations

- (ℓ_0, v) where $v(x) = 0.7$ and $v(y) = 0.61$
- (ℓ_0, v) where $v(x) = 0.2$ and $v(y) = 0.41$

are reachable from the initial configuration.

Exercise 3

Consider the following network of timed automata from the lecture.

- Give an example of a timed trace in the network above.

- Which of the following properties are true?

    - $A[]$ (W.rest $\vee$ $z \leq 100$)
    - $E\langle\rangle$ (W.rest $\wedge$ H.busy)
    - $A\langle\rangle$ W.rest
    - $E[]$ H.busy
    - W.work $-->$ W.rest

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