1. Group the following valuations over five clocks $\{x_1, x_2, \ldots, x_5\}$ into regions. Assume that $M_{x_1} = 8, M_{x_2} = 3, M_{x_3} = 5, M_{x_4} = 2, M_{x_5} = 7$.

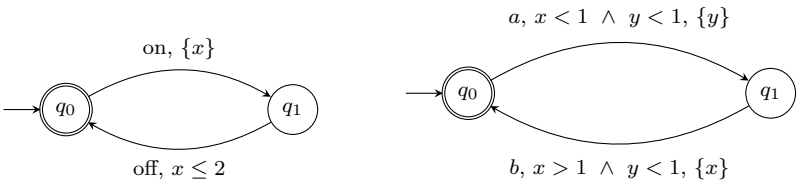
$$\begin{aligned} v_1 &:= (7.4,\ 2.1,\ 8.7,\ 5.4,\ 7.0) \\ v_2 &:= (3.4,\ 2.0,\ 8.5,\ 10.0,\ 7.1) \\ v_3 &:= (7.3,\ 2.2,\ 8.8,\ 5.2,\ 7.0) \\ v_4 &:= (7.5,\ 2.1,\ 8.9,\ 5.5,\ 7.0) \\ v_5 &:= (3.2,\ 2.0,\ 8.8, 10.0,\ 7.5) \\ v_6 &:= (3.3,\ 2.0,\ 8.4,\ 10.0,\ 7.2) \end{aligned}$$

2. Consider an automaton with 2 clocks $\{x, y\}$. Let the maximum bounds function M for the automaton be given by: $M(x) = 3, M(y) = 4$. Draw the division of the xy-plane into regions.

3. Given 3 clocks $\{x, y, z\}$ and $M(x) = 2, M(y) = 1, M(z) = 2$, enumerate the set of regions.

4. Let R be a region over clock set X and bound function M. Give an algorithm to compute the time-successors of a region R.

5. Draw the region automaton for the following automata:



6. Suppose R is a region over clock set X and bound function M. Let x, y be two arbitrary clocks in X. Is the projection of R on to the xy-plane a region over $\{x, y\}$ with the bounds function M restricted to x and y?