Exercise 33

Given LTS $L$ as shown on the right.

1. List all different infinite traces in $L$, using $\omega$-notation, e.g. $abab\cdots = (ab)^\omega$.

2. Find 6 equivalences between traces from part a), using notation $\pi^i$, e.g. $\pi_2 = \pi_1^i$ for $\pi_1 = xyz$ and $\pi_2 = yz$.

Exercise 34

Given LTS $L$ and CTL/HML formulae 1 to 6 as shown below. For each state $s$ of $L$, determine which of formulae 1 to 6 hold in $s$.

1. $\text{EX}(\langle x \rangle 1)$
2. $\text{AX}(\langle y \rangle 0)$
3. $\text{AG}(\langle z \rangle 1 \rightarrow \langle y \rangle 1)$
4. $\text{E}[\langle x \rangle 1 \text{ U } \langle z \rangle 1]$  
5. $\text{EG}(\langle y \rangle 1)$
6. $\text{EF}(\text{EG}(\langle x \rangle 1)$}
**Exercise 35**

Draw the Kripke structure for the LTS as shown below.

![Kripke structure diagram]

**Exercise 36**

Draw a computation tree for each of the following CTL formulae (see also lecture slides 63-65).

1. $\text{EF } p$
2. $\text{EX } p$
3. $\text{EG } p$
4. $\text{AX } p$
5. $\text{A}[p \text{ U } q]$
6. $\text{E}[p \text{ U } q]$