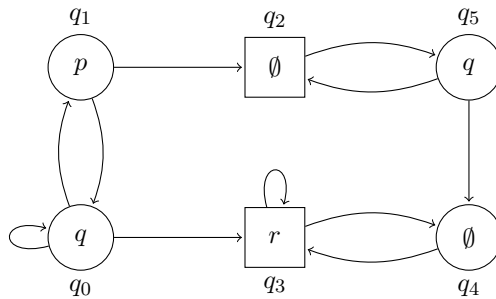


System Specification and Verification

- Seminar - Weeks 9,10 -

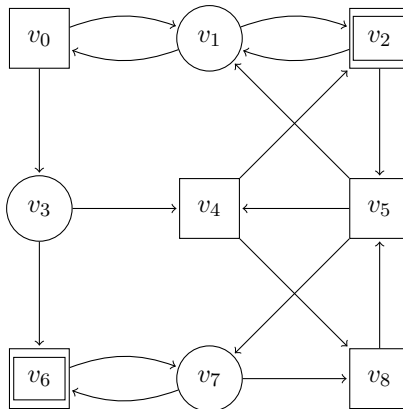
Spring 2026

1. Consider the game arena from below where Player A controls circle states and Player B controls square states.

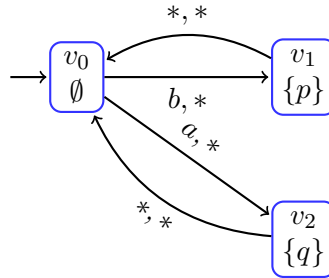


Let consider the Buchi objective $\text{Büchi}(T)$ for Player A, where $T = \{q_0, q_1, q_3\}$. Compute the states from which Player A has a winning strategy.

2. Give the states in the following game arena from which the player controlling squares has a strategy to visit finitely often the set $\{v_2, v_6\}$.

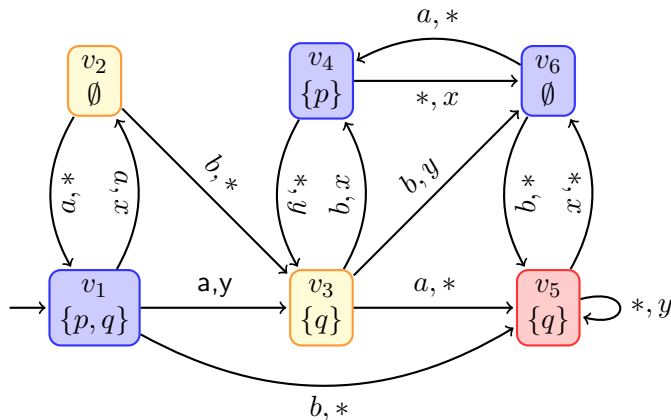


3. Let consider the following arena.



The aim is to enforce the infinite appearance of both p and q along the executions.

- Formalize as an LTL formula the above requirement.
 - Is it true that all possible executions satisfy the specification?
 - Give a strategy for Player A to enforce the satisfaction of the specification. Does this strategy need memory? Formalize it.
4. Consider the game arena from below where Player A has imperfect information and plays actions in $\{a, b\}$ and Player B is perfectly informed and plays actions in $\{x, y\}$. The indistinguishability relation for Player A is illustrated with colors in the figure below (each color is an observation).



The aim is to give an observation-based strategy for Player A (if any) from the state v_1 to win the game \mathcal{G} with the co-Büchi objective $\text{COBÜCHI}(\{v_5\})$.

- Draw the perfect information game obtained by removing imperfect information (by computing possible states) from the game \mathcal{G} with the initial state v_1 . Don't forget to specify which is the winning condition in the obtained game.
- Solve the obtained co-Büchi game.