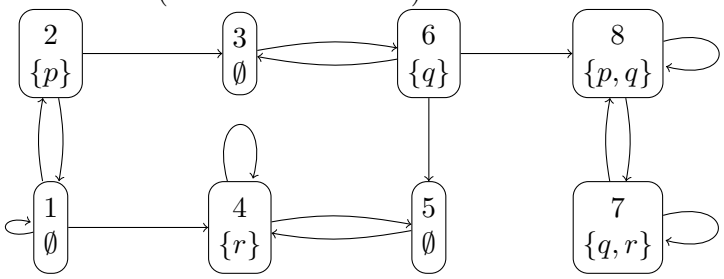
Homework 3

To hand in on October 5th at 14:00, during the exercise session or by mail at `marie.fortin@lsv.fr`.

Exercise 1 (Semantics of CTL*)**.**



Compute the following sets for the given model:

1. $[\![\mathsf{EG}\, r]\!]$
2. $[\![\mathsf{AX}\, q]\!]$
3. $[\![\varphi_1]\!]$ where $\varphi_1 = (\mathsf{EG}\, r) \vee (\neg q \wedge \mathsf{EX}\, q)$
4. $[\![\mathsf{E}\, \psi]\!]$ where $\psi = \mathsf{GF}\, \varphi_1 \to \mathsf{GF}(q \wedge \neg r)$

Exercise 2 (Equivalences)**.** Are the following formulæ equivalent? Give a proof or a counter example.

1. $\mathsf{A}\,\mathsf{X}\,\mathsf{A}\,\mathsf{G}\, \varphi$ and $\mathsf{A}\,\mathsf{X}\,\mathsf{G}\, \varphi$
2. $\mathsf{E}\,\mathsf{X}\,\mathsf{E}\,\mathsf{G}\, \varphi$ and $\mathsf{E}\,\mathsf{X}\,\mathsf{G}\, \varphi$
3. $\mathsf{A}(\varphi \wedge \psi)$ and $\mathsf{A}\, \varphi \wedge \mathsf{A}\, \psi$
4. $\mathsf{E}(\varphi \wedge \psi)$ and $\mathsf{E}\, \varphi \wedge \mathsf{E}\, \psi$
5. $\neg\, \mathsf{A}(\varphi \Rightarrow \psi)$ and $\mathsf{E}(\varphi \wedge \neg\psi)$