Problem Set 6

1. Consider a ω-automaton $(Q, \Sigma, \delta, q_0, Acc)$, and let $\mathcal{G} \subseteq 2^Q$ be a set of good states. An ω-word α is said to be accepted iff there is a run ρ of α such that $Inf(\rho) \in \mathcal{G}$. $\delta : Q \times \Sigma \to 2^Q$ is the transition function.
   - Construct a deterministic ω-automata with this acceptance condition that captures the language "Finitely many b's".
   - Show that ω-automata with this acceptance condition captures ω-regular languages.
   - How do you complement a deterministic ω-automata with this acceptance condition?
2. Prove or disprove : A finite set of infinite words is ω-regular.
3. Give an example of a language accepted by an NBA, but which cannot be written in LTL.
4. Show that a language L is omega-regular iff it is of the form $\bigcup_{i=1}^{n} U_i V_i^{\omega}$ where U_i, V_i are regular.
5. Exercises 5.24, 5.23, 5.17, 5.13, 4.7, 4.14, 4.15, 4.16, 4.21, 4.23, 4.24, 4.25 from Baier-Katoen.