Exercise 5
Draw an FA $A$ with input-alphabet $\Sigma := \{a, b\}$ having exactly 3 states such that...

1. $A$ is non-deterministic and incomplete.
2. $A$ is deterministic and incomplete.
3. $A$ is non-deterministic and complete.
4. $A$ is deterministic and complete.

Justify each of your solutions.

Exercise 6
Let $A_1$ be an arbitrary FA and $\mathbb{P}(A_1) := (S, I, \Sigma, T, F)$ be the power automaton of $A_1$. Describe in your own words the formal definition of $\mathbb{P}(A_1)$, including all of its components. Is the following proposition true? Justify your answer.

$|S' \xrightarrow{a} | = 1$ for all $S' \in S$ and for all $a \in \Sigma$.

Exercise 7
Draw the power automaton $\mathbb{P}(A)$ for FA $A$ as shown on the right. What is the maximum number of states $\mathbb{P}(A)$ can have in theory? Justify your answer.

Exercise 8
Draw a deterministic FA $A$ with $\Sigma := \{a, b\}$ having at least 3 states such that $L(C(A)) \neq L(A)$, where $C(A)$ denotes the complement-automaton of $A$. Explain your solution.
**Bonus Exercise**

Reimplement the program available at

http://fmv.jku.at/fm/faimpl.zip

in your favorite object-oriented language (Java, C#, C++, ...) using the "objects for states"-pattern. Please ensure that you bring it in electronic form (USB stick, laptop) for the presentation.