Homework 1

1. **(Optional)** If you want to run the code presented in the lectures, install the Scala programming language available (for free) from

   `http://www.scala-lang.org`

2. **(Optional)** Have a look at the crawler programs. Can you find a usage for them in your daily programming life?

3. In the context of the AFL-course, what is meant by the term *language*?

4. Give the definition for regular expressions. What is the meaning of a regular expression?

5. Assume the concatenation operation of two strings is written as $s_1@s_2$. Define the operation of *concatenating* two sets of strings.

6. How is the power of a language defined? (Hint: There are two rules, one for $\_^0$ and one for $\_^{n+1}$.)

7. Given the regular expressions $r_1 = \epsilon$ and $r_2 = \varnothing$ and $r_3 = a$. How many strings can the regular expressions r_1^*, r_2^* and r_3^* each match?