Regular Expressions & Automata
Lab Session

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The main goal of this lab session is to make you familiarize with the concepts of *automata and regular expressions*. In this handout there are **3 tasks** to perform.

Practicalities

The participation in this lab session is voluntary: you do not have to submit any result. If you want to get feedback, please ask questions during today's session. Moreover, we will discuss the results of this handout together in the next lab session. The exercises in this handout are based on exercises from Roman Klinger and Gabriella Lapesa.

Task 1

1. Download the slides about Regular expressions (Lab4-Regexp.pdf) and do all the exercises (slides marked with "Exercises").
2. Test the correctness of your Regular Expression using the terminal.
3. Paste each working command in a text file.

Task 2

Given the automaton (Σ, S, s_0, δ, F) with

- $\Sigma = \{a, b, c\}$
- $S = \{1, 2, 3\}$
- $s_0 = 1$
- $\delta(1, a) = 2$, $\delta(1, c) = 3$, $\delta\ (2, b) = 1$
- $F = \{3\}$

4. Draw the automaton.
5. Write a regular expression which matches the same words as those accepted by this automaton.
6. Write a series of examples of strings that can be recognised by this automaton.

Task 3

Given the following regular expression: m{1}(e|e+|)o{1,}w{2}

7. Simplify it by reformulating it in a more compact form.
8. List three accepted words
9. Produce the corresponding FSA