

Automaten und Formale Sprache

Aufgabenblatt 2

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7. Oktober 2024

Aufgabe 1

(Das leere Wort ist überall dabei)

1. $L(r \mid r^*) = \{r, rr, rrr, \dots\}$
2. $L(r \cdot t)^* = \{rt, rtrt, rtrtrtrt \dots\}$
3. $L(r^* \cdot t^*) = \{r, t, rr, tt, rt, rtt, ttt, \dots\}$
4. $L(t \cdot r)^* = \{tr, trtr, trtrtr \dots\}$
5. $L(r \mid t)^* = \{r, t, rr, rt, tr, ttr, rrrt \dots\}$
6. $L(r^* \mid t^*) = \{r, t, rr, tt, rrr, ttt \dots\}$
7. $L(0^* \cdot 1)^* \cdot 0^* = \{0, 1, 10, 01, 000, 100, 110 \dots\}$
8. $L(1 \mid 0)^* = \{0, 1, 0, 1, 10, 00, 11, 001 \dots\}$

Aufgabe 2

```
FloatRegex.java

package task02;

import java.util.regex.Pattern;

public class FloatRegex {

    public Boolean matches(final String input) {
        final Pattern pattern = Pattern.compile("[+-]?(0|[1-9]\\d*)(\\.\\d+)?([eE][+-]?\\d+)?");
        return pattern.matcher(input).matches();
    }

}
```

Aufgabe 3

```
DateTimeRegex.java

package task02;

import java.util.regex.Pattern;

public class DateTimeRegex {

    public Boolean matches(final String input) {
        final Pattern pattern = Pattern.compile("\\d{4}-(0?[1-9]|1[0-2])-(0?[1-9]|1[0-9]|2[0-9]|3[0-1])T(0?[0-9]|1[0-9]|2[0-4]):\\d{2}:\\d{2}:\\d{3}");
        return pattern.matcher(input).matches();
    }
}
```

Aufgabe 4

```
LicensePlateRegex.java

package task02;

import java.util.regex.Pattern;

public class LicensePlateRegex {

    public Boolean matches(final String input) {
        final Pattern pattern = Pattern.compile("[a-zA-ZÄÖÜäöüß]{1,3} [a-zA-ZÄÖÜäöüß]{1,2} [1-9]\\d{0,3}( [HE])?");
        return pattern.matcher(input).matches();
    }
}
```