Documentation for the Automaton Package

Tomke Quintus Pfoch and Matthias Wagner

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1 Introduction

The ‘automaton‘ package provides a convenient way to create TikZ-based automatons and Turing machine graphs. It offers an intuitive interface for defining states, transitions, and automaton diagrams.

2 Installation

To use the ‘automaton‘ package, place the ‘automaton.sty‘ file in the same directory as your LaTeX document or in a directory recognized by your LaTeX distribution (e.g., ‘ /texmf/tex/latex/‘).

3 Usage

Include the package in your document with:

```
\usepackage{automaton}
```

3.1 Basic Environment

Use the ‘automaton‘ environment to create an automaton diagram:

```
\begin{automaton}
    % Code for states and transitions
\end{automaton}
```

4 Commands

Here are the main commands provided by the ‘automaton‘ package:

4.1 \state

Creates a standard state.

Syntax: `\state{name}{position}`

Example: `\state{1}{2,0}`

4.2 \startstate

Creates a start state.

Syntax: `\startstate{name}{position}`

Example: `\startstate{0}{0,0}`

4.3 \finstate

Creates an end state.

Syntax: `\finstate{name}{position}`

Example: `\finstate{2}{4,0}`

4.4 \transition

Defines a transition between states, optionally with a bend direction.

Syntax: `\transition[from]{to}{label}`

Example: `\transition{0}{1}{a:X,R}`

With direction: `\transition[right]{2}{1}{c:c,L}`

4.4.1 Advanced use of \transition

The package allows more complex definitions, such as multiple transitions on one arrow using the syntax

`a:b,R|c:c,R`

. This feature enables you to define multi-line labels on transitions.

5 Examples

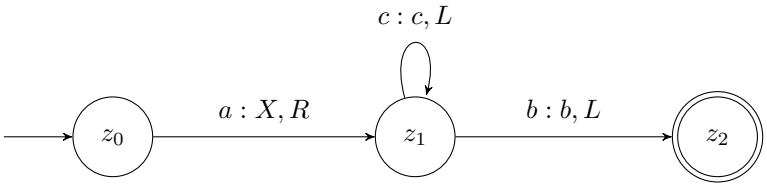
Below is a simple example to demonstrate how to create an automaton diagram:

```
\begin{automaton}
    \startstate{0}{0,0}
    \transition{0}{1}{a:X,R}

    \state{1}{2,0}
    \transition{1}{2}{b:b,L}
    \transition[right]{1}{1}{c:c,L}

    \finstate{2}{4,0}
\end{automaton}
```

This code produces this automaton diagram with three states and transitions between them.



6 Customization

You can adjust the size of the nodes by passing an optional parameter to the ‘automaton‘ environment:

```
\begin{automaton}[40]
    % Custom-sized diagram
\end{automaton}
```

7 Package Dependencies

The ‘automaton‘ package depends on the following LaTeX packages:

- `tikz` (with libraries: arrows, decorations, positioning, etc.)
- `xstring`
- `etoolbox`
- `expl3`

8 License

The package is not yet distributed, so it isnt licensed right now
You are free to use it for all non-commertial purposes:).

9 Contact

For questions or contributions, please contact us at matthias5.wagner@gmx.de or through our GitHub.