dot2tex Documentation

Release 2.11.3

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Contents

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The purpose of dot2tex is to give graphs generated by Graphviz a more LaTeX friendly look and feel. This is accomplished by converting xdot output from Graphviz to a series of PSTricks or PGF/TikZ commands. This approach allows:

- Typesetting labels with LaTeX, allowing mathematical notation
- Using native PSTricks and PGF/TikZ commands for drawing arrows
- Using backend specific styles to customize the output

CHAPTER 1

User's guide

1.1 Installation guide

1.1.1 Dependencies

The following software and modules are required to run dot2tex:

- Python 2.7 or 3.x.
- pyparsing. Version 1.4.8 or later is recommended.
- Graphviz. A recent version is required.
- preview. A LaTeX package for extracting parts of a document. A free-standing part of the preview-latex/AUCTeX bundle.
- PGF/TikZ version 2.0 or later.

Users have reported problems using dot2tex with old versions of pyparsing and Graphviz.

A natural companion to dot2tex is the dot2texi LaTeX package for embedding graphs directly in your LaTeX source code.

1.1.2 Using pip or easy_install

The easiest way to install dot2tex is to use pip (recommended) or easy_install:

```
$ pip install dot2tex
```

or easy_install:

```
$ easy_install dot2tex
```

If you are on Linux or Mac OS X you may have to call pip or easy_install using `sudo`:

```
$ sudo pip install dot2tex
```

The commands will locate dot2tex and download it automatically. Note that documentation and examples are not installed by default. *Pip* and easy_install will also create a wrapper script or EXE file for you and install dependencies if necessary.

1.1.3 Binary packages

Binary packages are available for Debian and OpenSUSE.

1.1.4 From source

Download a zip or a tarball from the download page. Unpack the file to a directory and run `python` on the `setup.py` file:

```
$ python setup.py install
```

This will create a dot2tex module in your Python modue directory and a wrapper script in your `SCRIPTS` directory. Note that a few warnings will be displayed. You can safely ignore them. The warnings are shown because there is some extra information in the `setup.py` file that distutils does not understand.

1.1.5 Development version

The development version of `dot2tex` is hosted on GitHub. To get the code you can use the following command:

```
git clone https://github.com/kjellmf/dot2tex.git
```

1.2 Usage guide

1.2.1 Invoking dot2tex from the command line

Syntax:

```
dot2tex [options] [inputfile]
```

Input data is read from standard input if no input file is specified. Output is written to standard output unless a destination file is set with the `-o` option.

Dot2tex can also be loaded as a module for use in other Python program. See the section *Using dot2tex as a module* for more details.

Dot2tex relies on the xdot format generated by Graphviz. Dot2tex will automatically run `dot` on the input data if it is in the plain dot format. If you want to use other layout tools like `neato` and `circo`, use the `--prog` option. You can pass options to the layout program with the `--progoptions` option.

A few examples on how to invoke dot2tex:

Read a file from standard input and write the result to the file `test.tex`:

```
$ dot -Txdot test.dot | dot2tex > test.tex
$ neato -Txdot -Gstart=rand test.dot | dot2tex > test.tex
```

Load `test.dot`, convert it to xdot format and output the resulting graph using the `tikz` output format to `testpgf.tex`:

```
$ dot2tex -ftikz test.dot > testtikz.tex
```

The same as above, but use neato for graph layout:

```
$ dot2tex --prog=neato -ftikz test.dot > testtikz.tex
```

Invoking dot2tex

If you are on Windows and have installed dot2tex from source, you have to type `python dot2tex` to invoke the program.

1.2.2 Command line options

The following options are available:

-h, --help Display help message.

-f fmt, --format fmt Set output format. The following values of *fmt* are supported:

- **`pgf`** PGF/TikZ. Default.
- **`pstricks` or `pst`** Use PSTricks.
- **`tikz`** TikZ format.

-t mode, --texmode mode Text mode. Specify how text is converted.

- **`verbatim`** Text is displayed with all special TeX chars escaped (default).
- **`math`** Output all text in math mode $$.
- **`raw`** Output text without any processing.

Note that you can locally override the text mode by assigning a special `texlbl` attribute to a graph element, or by using the `texmode` attribute. See *Labels* for details.

-s, --straightedges Draw edges using straight lines. Graphviz uses bezier curves to draw straight edges. Use this option to force the use of line to operations instead of curves. Does not work in `duplicate` mode.

-o filename, --output filename Write output to file.

-d, --duplicate Duplicate the xdot output. Uses the drawing information embedded in the xdot output to draw nodes and edges.

--template filename Use template from file. See the *Templates* section for more details.

-V, --version Print version information and exit.

-w, --switchdraworder Switch drawing order of nodes and edges. By default edges are drawn before nodes.

-c, --crop Use `preview.sty` to crop the graph. Currently only implemented for the `pgf` and `tikz` output format.

--figonly Output the graph without a document preamble. Useful if the graph is to be included in a master document.

--codeonly Output only the drawing commands, without wrapping it in a `tikzpicture` or `pspicture` environment. Useful when used with the dot2texi package.

--preproc Preprocess the graph through LaTeX using the preview package. Will generate a new dot file where the height and widths of nodes and edge labels are set based on the results from preview.

--autosize Preprocess the graph and run Graphviz on the output. Equivalent to:

```
$ dot2tex --preproc ex1.dot | dot2tex
```

--prog program Set graph layout program to use when the input is in plain dot format. Allowed values:

- `dot` (default)
- `neato`
- `circo`
- `fdp`
- `twopi`

--progoptions options Pass options to graph layout program.

--usepdflatex Use pdflatex instead of latex for preprocessing the graph.

--nominsize Ignore minimum node sizes during preprocessing.

--valignmode mode Vertical alignment of node labels, where `mode` can have the values:

`center` Labels are placed in the middle of the node (default).

`dot` Use the coordinate given by the xdot output from Graphviz.

(`pgf` and `pstricks` only)

--alignstr Used to pass a default alignment string to the PSTricks `\rput` command:

```
\rput[alignstr] ...
```

Only works for the PSTricks format. PGF/TikZ users can instead pass an `anchor=...` style using the `graphstyle` option.

--tikzedgelabels Bypass Graphviz' edge label placement and use PGF/TikZ instead (`tikz` and `pgf` formats only).

--styleonly Use TikZ only styles when drawing nodes. No `draw` or `shape` option is added (`tikz` format only).

--nodeoptions tikzoptions Wrap node code in a `scope` environment with `tikzoptions` as parameter (`tikz` format only).

--edgeoptions tikzoptions Wrap edge code in a `scope` environment with `tikzoptions` as parameter (`tikz` format only).

--debug Write detailed debug information to the file dot2tex.log in the current directory.

--pgf118 Generate code compatible with PGF 1.18 and earlier.

--pgf210 Generate code compatible with PGF 2.10.

The following options are used by the output *templates*.

-e encoding, --encoding encoding Set text encoding. Supported encodings are:

- `utf8`
- `latin1`

--docpreamble TeXcode Insert TeX code in the document preamble.

--figpreamble TeXcode Insert TeX code in the figure preamble.

--figpostamble TeXcode Insert TeX code in the figure postamble.

--graphstyle style Sets the `<<graphstyle>>` tag.

--margin margin Set margin around the graph when using `preview.sty`. `margin` must be a valid TeX unit. By default `margin` is set to `0pt`.

1.2.3 Output formats

The output format is specified with the `-f fmt` or `--format fmt` command line option. The following output formats are available form the command line. Additionally there is a special *positions output format* only available when using dot2tex as Python module.

PGF

This is the default output format. Generates code for the Portable Graphics Format (PGF) package . Mixes both PGF and TikZ commands.

PSTricks

Generates code for the PSTricks package.

TikZ

The `tikz` output format also uses the PGF and TikZ package. However, it relies on TikZ node and edge mechanisms to draw nodes and edges, instead of using the drawing information provided by Graphviz. This allows much tighter integration with TikZ and in some cases prettier results.

Advantages of the `tikz` format:

- The generated code is very compact and clean.
- Easy to modify the output.
- Labels will fit inside nodes without preprocessing.
- Full access to the power of PGF and TikZ.

You can find more details in the section: *Use the tikz output format for maximum flexibility*.

Note: The `tikz` output format requires detailed knowledge of the PGF and TikZ package. Some of Graphviz' features will not work with this output format.

1.2.4 Labels

The main purpose of dot2tex is to allow text and labels to be typeset by LaTeX. Labels are treated differently according to the current TeX mode:

verbatim Text is displayed with all special TeX chars escaped (default).

math Output all text in math mode $$.

raw Output text without any processing.

The TeX mode can be set on the command line using the `-t` option. It can also be set locally in a graph by using the special `texmode` attribute.

You can also use the special `texlbl` attribute on a graph element, which is interpreted as `raw` TeX string. If a `texlbl` attribute is found, it will be used regardless of the current TeX mode. It also has precedence over the `label` attribute.

Note: The \ character needs to be escaped with \\ if used in the `label` attribute.

Note that only position and alignment information is converted. Any font information is lost. This may result in some odd behavior. Some tweaking may be necessary to get it right. See the section *Vertical label alignment* for tips.

Note: If you use `texlbl` for edges, you have to provide a dummy `label` attribute. Otherwise Graphviz will not generate the necessary code for placing edge labels.

Label examples

Consider the following graph:

```
digraph G {
    a_1-> a_2 -> a_3 -> a_1;
}
```

Converting the graph using:

```
$ dot2tex -tmath ex1.dot > ex1.tex
```

gives the result shown in the left hand side of the figure below. The default rendering is shown to the right. Using the `raw` mode will result in a compilation error because of the underscore character.

Example of using `texlbl`:

```
digraph G {
    a_1 [texlbl="$\frac{\gamma}{x^2}$"];
    a_1-> a_2 -> a_3 -> a_1;
}
```

Example of using the `texmode` attribute:

```
digraph G {
    a_1 [texlbl="$\frac{\gamma}{2x^2+y^3}$"];
    a_1 -> a_2 -> a_3 -> a_1
    node [texmode="math"];
    a_1 -> b_1 -> b_2 -> a_3;
```

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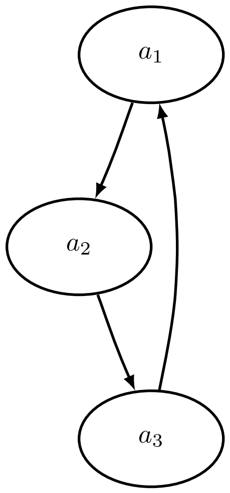
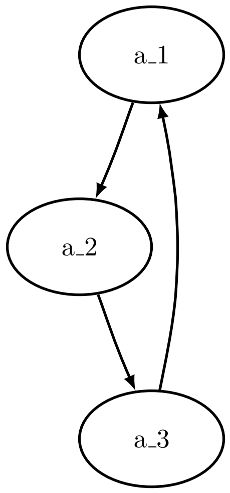
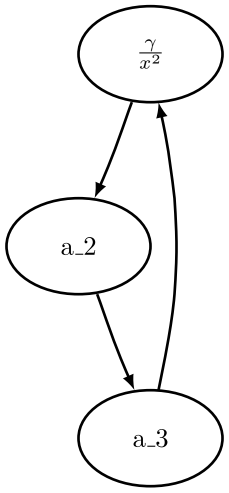
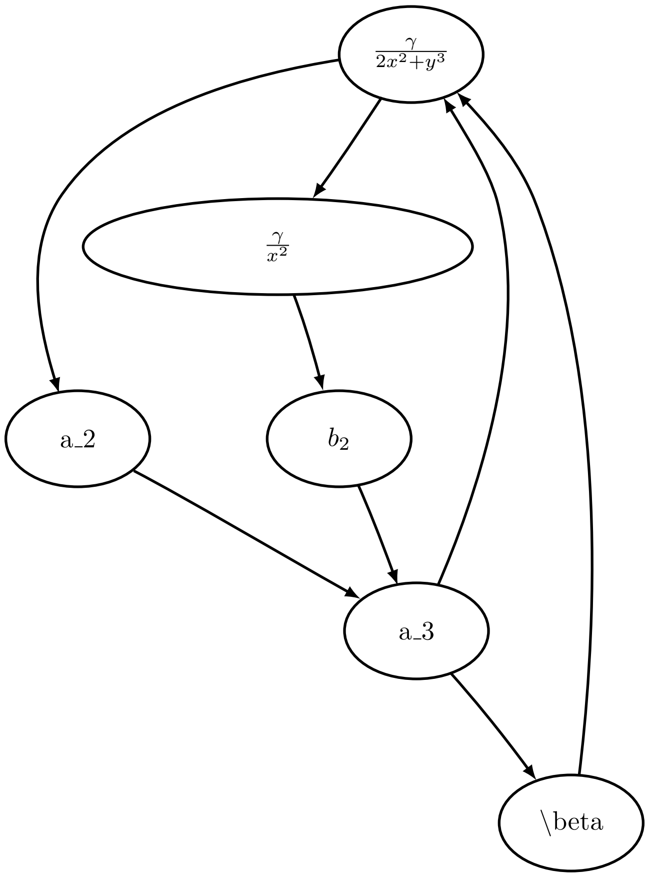

a_1
a_2
a_3


a_1
a_2
a_3


$\frac{\gamma}{x^2}$
a_2
a_3

(continued from previous page)

```
    b_1 [label="\\frac{\\gamma}{x^2}"];
    node [texmode="verbatim"]
    b_4 [label="\\beta"]
    a_3 -> b_4 -> a_1;
}
```



The above example shows two important things:

- The backslash \ character needs to be written as \\ in the `label` attribute.
- Using LaTeX markup in the `label` attribute gives oversized nodes. A workaround is to use the `texlbl` attribute, and manually pad the `label` attribute to an appropriate length. A much better solution is to use the `--preproc` option.

Preprocessing the above graph with:

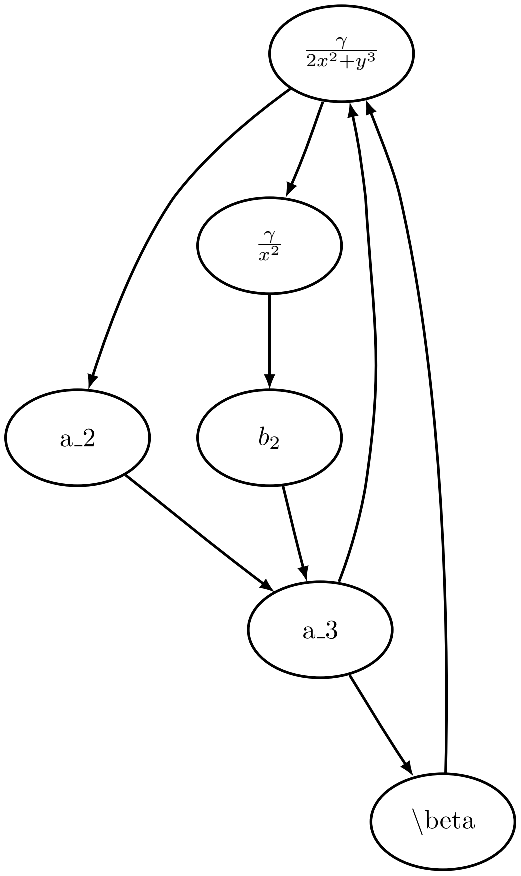
```
$ dot2tex --preproc ex4.dot | dot2tex > ex4.tex
```

gives correctly sized nodes:

Read more about preprocessing in the *Preprocessing graphs* section.

Vertical label alignment

Dot2tex relies on the xdot format for drawing nodes and placing node labels. The fonts that Graphviz and LaTeX use are different, so using the label coordinates from Graphviz does not always give good results. Dot2tex's default



$\frac{\gamma}{2x^2+y^3}$
$\frac{\gamma}{x^2}$
a_2
b_2
a_3
\beta

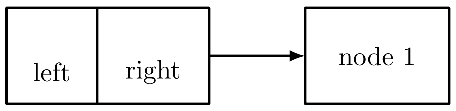
behavior is to place node labels in the middle of the node. However, you can change this behavior by setting the `valignmode` option to `dot`. Labels will then be placed using the coordinates supplied by Graphviz.

Here is an example graph where it is necessary to use the `valignmode` option:

```
digraph G {
    node0 [label="{left|right}", shape=record];
    node1 [shape=rectangle, label="node 1"];
    node0 -> node1;
    rankdir=LR;
}
```

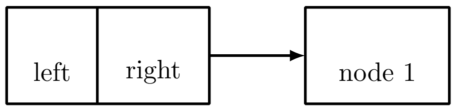
For record nodes dot2tex has to use Graphviz coordinates. This is shown in the following figure rendered with:

```
$ dot2tex valign.dot
```



To get the same vertical alignment for both nodes, you can use:

```
$ dot2tex --valignmode=dot valign.dot
```

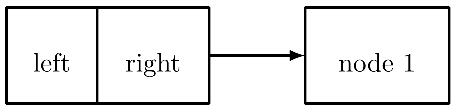


Now the labels are aligned, but the labels are still placed too low. The reason for this is that both PSTricks and PGF by default centers text vertically on the current coordinate. The alignment point should in this case be set to the baseline. For PGF/TikZ you can use the `--graphstyle` option like this:

```
$ dot2tex --valignmode=dot --graphstyle="anchor=base" valign.dot
```

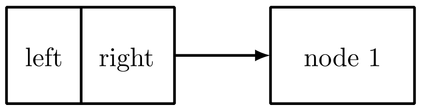
PSTricks users have to use the `--alingstr` option:

```
$ dot2tex --valignmode=dot --alignstr=B valign.dot
```



The result is better, but to get even better alignment you have to change the node font size. Graphviz' default font size is 14pt, which is larger than the typical 10pt or 11pt used in LaTeX documents. By changing the node font size to 10pt we can trick Graphviz to give us a better alignment:

```
digraph G {
    node [fontsize=10];
    node0 [label="{left|right}", shape=record];
    node1 [shape=rectangle, label="node 1"];
    node0 -> node1;
    rankdir=LR;
}
```



1.2.5 Preprocessing graphs

A problem with using LaTeX for typesetting node and edge labels, is that Graphviz does not know the sizes of the resulting labels. To circumvent this problem, you can use the `--preproc` or `--autosize` option. The following will then happen:

1. Node and edge labels are extracted and the corresponding LaTeX markup is saved to a temporary file.
2. The file is typeset with LaTeX and information about sizes is extracted using the preview package.
3. A new dot file is created where node and edge label sizes are set using the dot language's `width` and `height` attributes.
4. The generated graph can now be processed using Graphviz and dot2tex. Label sizes will now correspond with the output from LaTeX.

Widths and heights of nodes are handled the in same way as Graphviz does it. The `width` and `height` attributes set the minimum size of the node. If label size + margins is larger that the minimum size, the node size will grow accordingly. Default values are width=0.75in and height=0.5in.

Node margins are set using the margin attribute. This also works for edge labels. `margin==value` sets both the horizontal and vertical margin to `value`, `margin=="hvalue,vvalue"` sets the horizontal and vertical margins respectively.

Note: All sizes are given in inches.

If you do not want a minimum node size, you can use the '–nominsize' option. Dot2tex will then use size of label + margins as node size.

Nodes with `fixedsize=True` attributes are not processed.

Limitations:

- Does not work for HTML-labels
- Does not work for record-based nodes

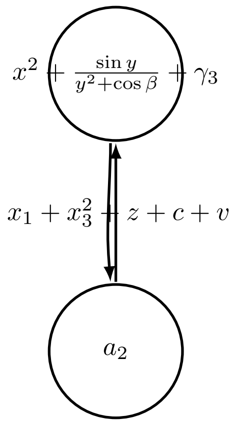
Examples

Consider the following graph:

```
digraph G {
    node [shape=circle];
    a_1 [texlbl="$x^2+\frac{\sin y}{y^2+\cos \beta}+\gamma_3$"];
    a_1 -> a_2 [label=" ", texlbl="$x_1+x_3^2+z+c+v~~$"];
    a_2 -> a_1;
}
```

Rendered with:

```
$ dot2tex -tmath example.dot > example.tex
```


$x^2 + \frac{\sin y}{y^2+\cos\beta} + \gamma_3$
$x_1 + x_3^2 + z + c + v$
a_2

the graph will look like this:

You could improve the result by adding a longer `label` attribute or setting a fixed width. A better solution is to preprocess the graph like this:

```
$ dot2tex -tmath --preproc example.dot > exampletmp.dot
$ dot2tex exampletmp.dot > example.tex
```

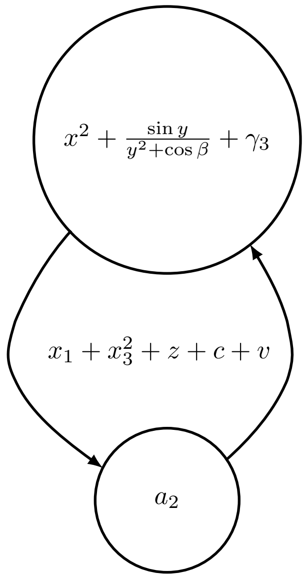
You can also chain the commands:

```
$ dot2tex -tmath --preproc example.dot | dot2tex > example.tex
```

A shorter alternative is:

```
$ dot2tex -tmath --autosize example.dot > example.tex
```

The resulting graph now has correctly sized nodes and edge labels:


$x^2 + \frac{\sin y}{y^2+\cos\beta} + \gamma_3$
$x_1 + x_3^2 + z + c + v$
a_2

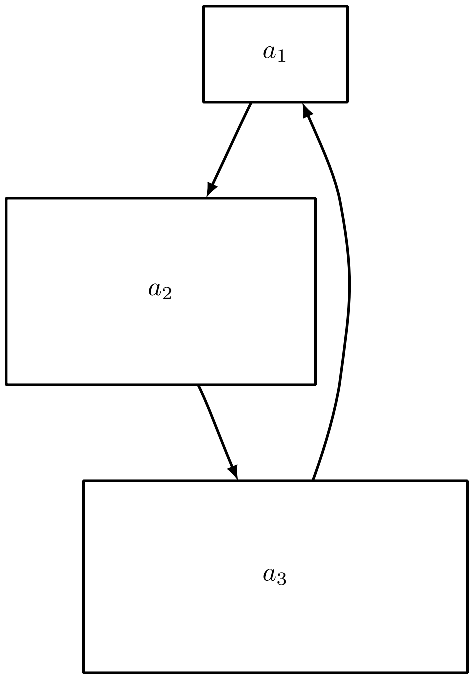
Modifying node sizes using the `widht/height` and `margin` attributes can be a bit counterintuitive. A few examples will hopefully make it clearer:

```
digraph G {
    node [shape=rectangle];
    a_1 [margin="0"];
    a_2 [margin="0.7,0.4"];
    a_3 [width="2",height="1"];
    a_1-> a_2 -> a_3 -> a_1;
}
```

Processing the graph with:

```
$ dot2tex -tmath --preproc example.dot | dot2tex > example.tex
```

gives



Setting the margin of `a_1` to 0 has no effect because of the minimum node width. Processing the graph with:

```
$ dot2tex -tmath --preproc --nominsize example.dot | dot2tex > example.tex
```

gives a different graph, where only label widths and margins affect the node sizes:

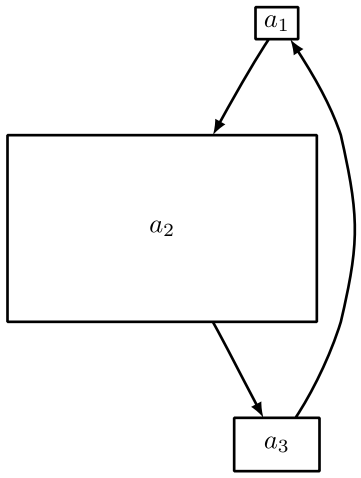
1.3 Customization guide

1.3.1 Customizing the output

Dot2tex offers a few ways of modifying the generated output.

Using styles

The dot language defines the `style` attribute that can be used to modify the appearance of graphs, nodes, and edges. The `style` attribute is passed to the rendering backend, and is a powerful and flexible way of customizing the look



and feel of your graphs. Using styles requires detailed knowledge of the output format.

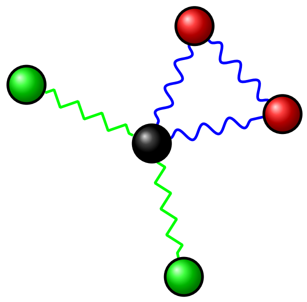
The following example shows how interesting visual results can be achieved with the PGF/TikZ output format. The styles are PGF/TikZ specific. See the user guide for details:

```
graph G {
    node [shape=circle, fixedsize=True, width="0.2",
          style="ball color =green", label=""];
    edge [style="snake=zigzag, green"];
    a_1 -- c -- a_2;
    c [style="ball color=black"];
    edge [style="snake=snake, blue"];
    node [style="ball color = red", label=""];
    a_3 -- c -- a_4 --a_3;
}
```

The `snake` styles only work on straight lines. We therefore have to use the `-s` option. `fdp` is used to lay out the graph:

```
$ fdp -Txdot ball.dot | dot2tex -ftikz -s > balls.tex
```

The resulting graph is shown below.



Note: Use the straight edge option `-s` to force the use of straight lines. Otherwise curves will be used to draw even straight lines.

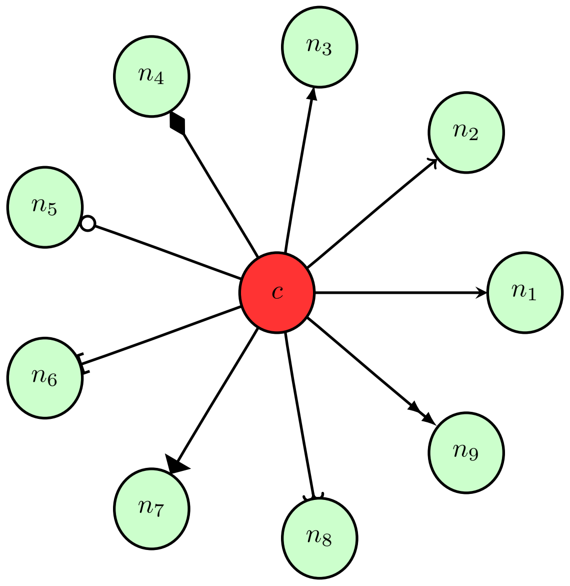
Changing arrow types

The style attribute can be used to change arrow types. A PGF/TikZ example:

```
digraph G {
    graph [mindist=0.5];
    node [fixedsize=true, shape=circle, width=0.4, style="fill=green!20"];
    c -> n_1 [style="-stealth"];
    c -> n_2 [style="-to"];
    c -> n_3 [style="-latex"];
    c -> n_4 [style="-diamond"];
    c -> n_5 [style="-o"];
    c -> n_6 [style="{-]}"];
    c -> n_7 [style="-triangle 90"];
    c -> n_8 [style="-hooks"];
    c -> n_9 [style="->>"];
    c [style="fill=red!80"];
}
```

Rendered with:

```
$ circo -Txdot pgfarrows.dot | dot2tex -tmath > pgfarrows.tex
```



You can also set the default arrow style by using the `--graphstyle` option or `d2tgraphstyle` attribute:

```
$ dot2tex -tmath --graphstyle=">=diamond" ex1.dot > ex1gstyle.tex
```

A PSTricks example:

```
digraph G {
    d2tdocpreamble="\usepackage{pstricks-add}";
    graph [mindist=0.5];
    node [texmode="math", fixedsize=true, shape=circle, width=0.4];
    c -> n_1 [style="arrows=->"];
    c -> n_2 [style="arrows=->>"];
    c -> n_3 [style="arrows=-<"];
```

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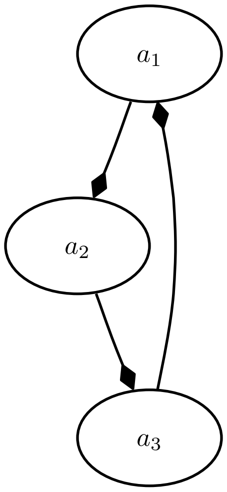

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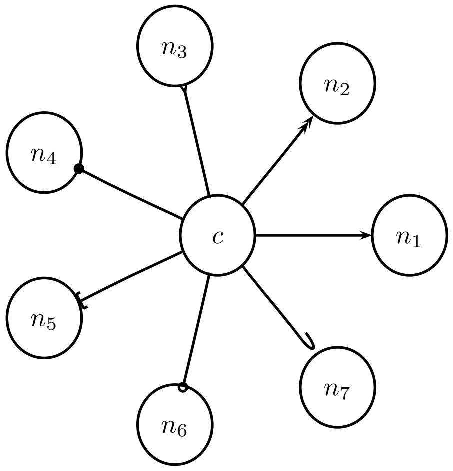
```
    c -> n_4 [style="arrows=-*"];
    c -> n_5 [style="arrows=-{]}"];
    c -> n_6 [style="arrows=-o"];
    c -> n_7 [style="arrows=-H"];
}
```

Rendered with:

```
$ circo -Txdot pstarrows.dot | dot2tex -fpst > pstarrows.tex
```



The above example shows how the `d2tdocpreamble` attribute can be used to load additional LaTeX packages. You could also use the ``--docpreamble`` option:

```
$ ... | dot2tex -fpst --docpreamble="\usepackage{pstricks-add}" ...
```

Label styles

Node, edge and graph labels can be styled using the special `lblstyle` attribute. However, this only works for the `pgf` and `tikz` output formats.

Labels are drawn using code like:

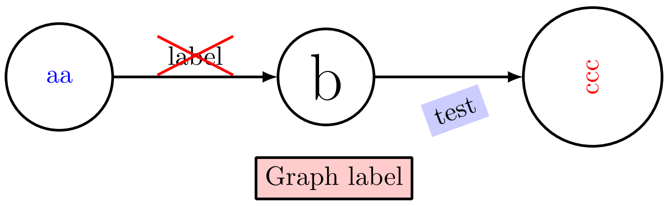
```
\draw (157bp,52bp) node {label};
```

When you specify a `lblstyle` attribute, the style will be given as a parameter to the node like this:

```
\draw (157bp,52bp) node[lblstyle] {label};
```

Example:

```
digraph G {
    node [shape=circle];
    a -> b [label="label",lblstyle="draw=red,cross out"];
    b -> c [label="test",lblstyle="below=0.5cm,rotate=20,fill=blue!20"];
    a [label="aa",lblstyle="blue"];
    b [lblstyle="font=\Huge"];
    c [label="ccc", lblstyle="red,rotate=90"];
    label="Graph label";
    lblstyle="draw,fill=red!20";
    rankdir=LR;
}
```



See the PGF and TikZ documentation for more information about styles.

Note: You can use the `exstyle` attribute in addition to `lblstyle`. The difference is that `exstyle` is ignored in preprocessing mode. Useful when using TikZ' `pin` and `label` options and you do not want them to influence the graph layout.

Node and edge options

The `tikz` output format offers an additional way of customizing the output by using the `--nodeoptions` and `--edgeoptions` options, or the `d2tnodeoptions` and `d2tedgeoptions` graph attributes. The code for generating nodes and edges will then be wrapped in a `scope` environment like this:

```
...
\begin{scope}[nodeoptions]
% code for drawing nodes
\end{scope}
\begin{scope}[edgeoptions]
% code for drawing edges
\end{scope}
...
```

1.3.2 Customizing edges

The `tikz` and `pgf` output formats offers a few additional ways of customizing how edges are drawn and how edge edge labels are placed. These features are tightly integrated with TikZ and detailed knowledge of the output format is therefore necessary.

TikZ edge labels

With the `--tikzedgelabel` option you can bypass the XDOT edge label placement and let PGF and TikZ do the job instead. This can be useful in some cases. However, this only works properly for straight edges and `to` paths.

Example:

```
graph G {
    mindist = 0.5;
    node [shape="circle"];
    edge [lblstyle="mystyle"];
    a -- b [label="ab"];
    b -- c [label="bc"];
    c -- a [label="ca"];
}
```

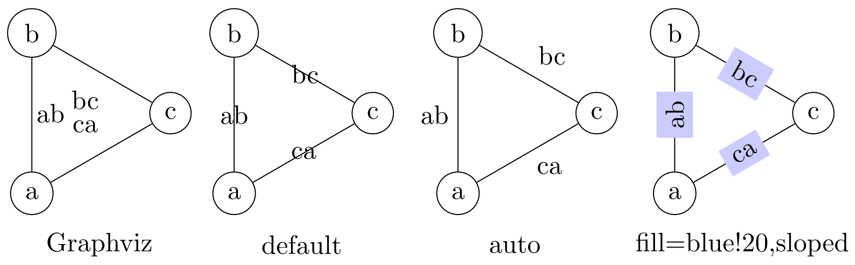
Without the `--tikzedgelabel` option the code for placing edges will look something like this:

```
% Edge: a -- b
\draw [] (28bp,55bp) -- (28bp,75bp);
\draw (40bp,65bp) node[mystyle] {ab};
% Edge: b -- c
\draw [] (51bp,88bp) -- (68bp,78bp);
\draw (66bp,96bp) node[mystyle] {bc};
% Edge: c -- a
\draw [] (69bp,51bp) -- (52bp,41bp);
\draw (53bp,57bp) node[mystyle] {ca};
```

With the `tikzedgelabels` option the output is simply:

```
\draw [] (a) -- node[mystyle] {ab} (b);
\draw [] (b) -- node[mystyle] {bc} (c);
\draw [] (c) -- node[mystyle] {ca} (a);
```

The placement of the edge labels depends on the options passed to the edge label node (in this case `mystyle`), and the curve used to connect the nodes. Some examples of `mystyle` values are shown in the figure below. The leftmost graph is rendered without the `tikzedgelabels` option.



Limitations:

- Works best with straight edges and `to` paths

- The headlabel and taillabel attributes are currently not affected by the tikzedgelabels option.

To paths

The topath edge attribute offers a way to override the edges drawn by Graphviz. When a topath attribute is encountered, dot2tex inserts a so called to path operation to connect the nodes. A number of predefined to paths are defined by TikZ, and you can create your own.

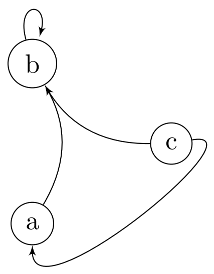
Example:

```
digraph G {
    mindist = 0.5;
    node [shape="circle"];
    a -> b [topath="bend right"];
    c -> b [topath="bend left"];
    c -> a [topath="out=10,in=-90"];
    b -> b [topath="loop above"];
}
```

Generating the graph with:

```
$ circo -Txdot topaths1.dot | dot2tex -ftikz > topaths1.tex
```

yields:



The generated edge drawing code is:

```
\draw [->] (a) to[bend right] (b);
\draw [->] (c) to[bend left] (b);
\draw [->] (c) to[out=10,in=-90] (a);
\draw [->] (b) to[loop above] (b);
```

Note: To paths works best with layout tools that generate straight edges (neato, fdp, circo, twopi). The topath attribute overrides the edge routing done by Graphviz. You may therefore end up with overlapping edges.

Here is a larger example that uses the automata library:

```
digraph G {
    d2tdocpreamble = "\usetikzlibrary{automata}";
    d2tfigpreamble = "\tikzstyle{every state}= \
    [draw=blue!50,very thick,fill=blue!20]";
    node [style="state"];
    edge [lblstyle="auto",topath="bend left"];
    A [style="state, initial"];
```

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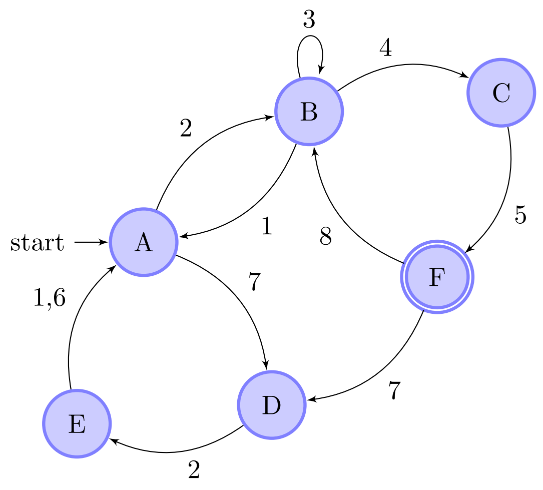
```
    A -> B [label=2];
    A -> D [label=7];
    B -> A [label=1];
    B -> B [label=3,topath="loop above"];
    B -> C [label=4];
    C -> F [label=5];
    F -> B [label=8];
    F -> D [label=7];
    D -> E [label=2];
    E -> A [label="1,6"];
    F [style="state,accepting"];
}
```

Generated with:

```
neato -Txdot fsm1.dot | dot2tex -ftikz --tikzedgelabels --styleonly
```



1.3.3 Color support

All Graphviz color formats are supported, including the RGBA format. Transparency will however only work when using the PGF/TikZ output format.

Named colors are supported, but you have to ensure that the colors are defined in the resulting LaTeX file. The default PSTricks and PGF/TikZ templates load the `X11names` color scheme defined in the xcolor package. Note that color names in the xcolor package are case sensitive. This is not the case with Graphviz's color names. Use CamelCase names in your graphs to ensure compatibility with xcolor.

For convenience, a color definition file `gcols.tex` is distributed with dot2tex. You can find it in the `examples` directory. This file defines most of Graphviz's named colors as lower case. Include this file in the preamble if you need it.

1.3.4 Templates

The output from dot2tex is a list of drawing commands. To render the graphics with LaTeX there's a need for some boiling plate code. This code can be customized using simple templates. If no template is specified with the `--template` option, a default template will be used.

The following template tags are available:

<<drawcommands>> The actual list of drawing commands.

<<figcode>> Drawing commands wrapped in a figure environment. Note that several important style options are set in the figure environment.

<<bbox>> Bounding box. Example: `(0bp,0bp)(100bp,100bp)` The individual parts of the bounding box are available with the tags:

- `<<bbox.x0>>`
- `<<bbox.y0>>`
- `<<bbox.x1>>`
- `<<bbox.y1>>`

Note that the bounding box parts are given without any units.

<<textencoding>> The text encoding used for the output file. Current values are: - `utf8` - `latin1`

<<docpreamble>> Document preamble. The content of this tag is set by the `--docpreamble` option or `d2tdocpreamble` graph attribute. Useful for including packages and such.

<<figpreamble>> Figure preamble. The content of this tag is set by the `--figpreamble` option or `d2tfigpreamble` graph attribute. Useful for setting font sizes and such.

<<preproccode>> Code generated for preprocessing labels.

Three different templates are used by dot2tex for the preprocessing mode, output mode and figure only mode respectively. The following template tags make it possible to use the same template file for all modes.

<<startoutputsection>> and <<endoutputsection>> Code between these tags is ignored in preprocessing mode.

<<startpreprocsection>> and <<endpreprocsection>> Code between these tags is ignored in output mode.

<<startfigonlysection>> and <<endfigonlysection>> Code between these tags is used as a template when using the `--figonly` option. Ignored in preprocessing and output mode.

Note: Tags that have no value are replaced with an empty string. Insert a `%` character after a template tag to avoid unwanted line breaks.

Default PGF/TikZ template

```
\documentclass{article}
\usepackage[x11names, rgb]{xcolor}
\usepackage[<<textencoding>>]{inputenc}
\usepackage{tikz}
\usetikzlibrary{snakes,arrows,shapes}
\usepackage{amsmath}
<<startpreprocsection>>%
\usepackage[active,auctex]{preview}
<<endpreprocsection>>%
<<gvcols>>%
<<cropcode>>%
<<docpreamble>>%
```

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```
\begin{document}
\pagestyle{empty}
%
<<startpreprocsection>>%
<<preproccode>>
<<endpreprocsection>>%
%
<<startoutputsection>>
\enlargethispage{100cm}
% Start of code
% \begin{tikzpicture}[anchor=mid,>=latex',join=bevel,<<graphstyle>>]
\begin{tikzpicture}[>=latex',join=bevel,<<graphstyle>>]
\pgfsetlinewidth{1bp}
<<figpreamble>>%
<<drawcommands>>
<<figpostamble>>%
\end{tikzpicture}
% End of code
<<endoutputsection>>
%
\end{document}
%
<<startfigonlysection>>
\begin{tikzpicture}[>=latex,join=bevel,<<graphstyle>>]
\pgfsetlinewidth{1bp}
<<figpreamble>>%
<<drawcommands>>
<<figpostamble>>%
\end{tikzpicture}
<<endfigonlysection>>
```

The `<<cropcode>>` template tag is available when the `--preview` option is used. The contents will then be:

```
\usepackage[active,tightpage]{preview}
\PreviewEnvironment{tikzpicture}
\setlength\PreviewBorder{<<margin>>}
```

Default pstricks template

```
\documentclass{article}
% <<bbox>>
\usepackage[x11names]{xcolor}
\usepackage[<<textencoding>>]{inputenc}
\usepackage{graphicx}
\usepackage{pstricks}
\usepackage{amsmath}
<<startpreprocsection>>%
\usepackage[active,auctex]{preview}
<<endpreprocsection>>%
<<gvcols>>%
<<docpreamble>>%


\begin{document}
\pagestyle{empty}
```

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```
<<startpreprocsection>>%
<<preproccode>>%
<<endpreprocsection>>%
<<startoutputsection>>%
\enlargethispage{100cm}

% Start of code
\begin{pspicture}[linewidth=1bp<<graphstyle>>]<<bbox>>
\pstVerb{2 setlinejoin} % set line join style to 'mitre'
<<figpreamble>>%
<<drawcommands>>
<<figpostamble>>%
\end{pspicture}
% End of code
<<endoutputsection>>%
\end{document}
%
<<startfigonlysection>>
\begin{pspicture}[linewidth=1bp<<graphstyle>>]<<bbox>>
\pstVerb{2 setlinejoin} % set line join style to 'mitre'
<<figpreamble>>%
<<drawcommands>>
<<figpostamble>>%
\end{pspicture}
<<endfigonlysection>>
```

1.3.5 Special attributes

Dot2tex defines several special graph, node and edge attributes. Most of them are not part of the DOT language.

texmode Changes locally how *Labels* are interpreted.

texlbl Overrides the current node or edge label.

d2tdocpreamble Sets the `<<docpreamble>>` tag.

d2tfigpreamble Sets the `<<figpreamble>>` tag.

d2tfigpostamble Sets the `<<figpostable>>` tag.

d2tgraphstyle Sets the `<<graphstyle>>` tag.

d2ttikzedgelabels Sets the `--tikzedgelabels` option.

d2tnodeoptions Sets the `--nodeoptions` option.

d2tedgeoptions Sets the `--edgeoptions` option.

style Used to pass styles to the backend. Styles are output format specific, with the exception of the styles defined by the DOT language.

lblstyle Used to set styles for drawing graph, node and edge labels. Only works for the `pgf` and `tikz` output formats.

exstyle The same as `lblstyle`, except that `exstyle` is ignored in preprocessing mode.

topath Used to set a `to` path operation for connecting nodes. Only works for the `tikz` output format.

d2talignstr Used to pass a default alignment string to the PSTricks `\rput` command:

```
\rput[d2talignstr] ...
```

d2toptions Allows you to pass options to dot2tex in the same format as from the command line. The `d2toptions` value is parsed in the same way as ordinary command line options.

1.3.6 Including external dot files

If your input file contains the single line

```
\input{filename.dot}
```

dot2tex will load the `filename.dot` file and convert it. This feature is useful when you want to use *the dot2texi package*, but don't want to include your dot code directly in your document.

1.4 Tips and tricks

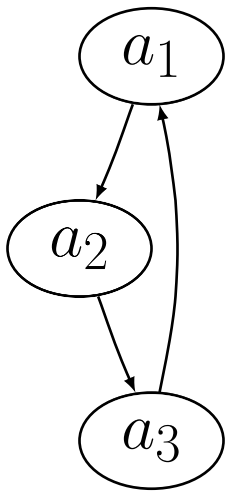
1.4.1 Fonts

No font information in the DOT file is preserved by dot2tex. However, there are several ways of modifying the generated LaTeX code to achieve some control of fonts and font sizes.

- Modifying the templates.
- Using the `d2tdocpreamble` and `d2tfigpreamble` attributes or command line options.
- Using the `lblstyle` attribute.

To increase the font size you can for instance insert a `\Huge` command in the figure preamble:

```
$ dot2tex -tmath --figpreamble="\Huge" ex1.dot > ex1huge.tex
```



1.4.2 Debugging

When making your own templates it is easy to make mistakes, and LaTeX markup in graphs may fail to compile. To make it easier to find errors, invoke dot2tex with the `--debug` option:

```
$ dot2tex --preproc --debug test.dot
```

A dot2tex.log file will then be generated with detailed information. In the log file you will find the generated LaTeX code, as well as well as the compilation log.

1.4.3 Be consistent

Be aware of differences between the template you use for preprocessing and code used to generate final output. This is especially important if you use the `--figonly` option and include the code in a master document. If a 10pt font is used during preprocessing, the result may not be optimal if a 12pt font is used in the final output.

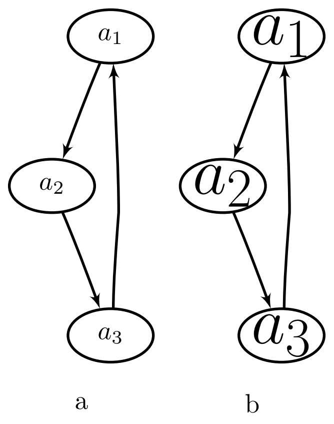
Example. A graph is generated with:

```
$ dot2tex --preproc -tmath --nominsize ex1.dot > ex1tmp.dot
```

Running through dot2tex again with:

```
$ dot2tex --figpreamble="\Huge" ex1tmp.dot > ex1huge.tex
```

gives labels that do not fit properly inside the nodes.



1.4.4 Postprocessing

The output from Graphviz and dot2tex is not perfect. Manual adjustments are sometimes necessary to get the right results for use in a publication. For final and cosmetic adjustments, it is often easier to edit the generated code than to hack the dot source. This is especially true when using the `tikz` output format.

1.4.5 Use the special graph attributes

Dot2tex has many options for customizing the output. Sometimes is is impractical or boring to type the various options at the command line each time you want to create the graph. To avoid this, you can use the special graph attributes. The `d2toptions` attribute is handy because it is interpreted as command line options.

So instead of typing:

```
$ dot2tex -tikz -tmath --tikzedgelabels ex1.dot
```

each time, use `d2toptions` like this:

```
digraph G {
    d2toptions ="-tikz -tmath --tikzedgelabels";
    ...
}
```

1.4.6 Use the tikz output format for maximum flexibility

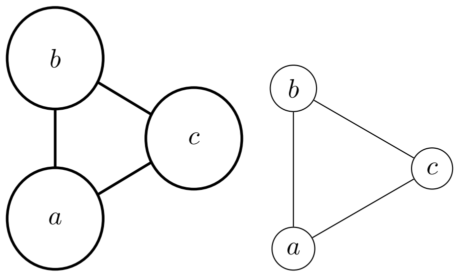
The difference between the `pgf` and `tikz` output formats is best shown with an example. Consider the following graph:

```
graph G {
    mindist = 0.5;
    node [shape=circle];
    a -- b -- c -- a;
}
```

Rendering the graph using `circo` and the `pgf` and `tikz` output formats:

```
$ circo -Txdot simple.dot | dot2tex -tmath -fpgf -s
$ circo -Txdot simple.dot | dot2tex -tmath -ftikz -s
```

gives visually different graphs:



(a) pgf (b) tikz

However, the main difference is in the generated code. Here is the `pgf` output:

```
% Edge: a -- b
\draw [] (19bp,38bp) -- (19bp,60bp);
% Edge: b -- c
\draw [] (35bp,70bp) -- (55bp,58bp);
% Edge: c -- a
\draw [] (55bp,40bp) -- (35bp,28bp);
% Node: a
\begin{scope}
\pgfsetstrokecolor{black}
\draw (19bp,19bp) ellipse (18bp and 19bp);
\draw (19bp,19bp) node {$a$};
\end{scope}
% Node: b
\begin{scope}
\pgfsetstrokecolor{black}
\draw (19bp,79bp) ellipse (18bp and 19bp);
\draw (19bp,79bp) node {$b$};
\end{scope}
% Node: c
```

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```
\begin{scope}
\pgfsetstrokecolor{black}
\draw (71bp,49bp) ellipse (18bp and 19bp);
\draw (71bp,49bp) node {$c$};
\end{scope}
```

Compare the above code with the `tikz` output:

```
\node (a) at (19bp,19bp) [draw,circle,] {$a$};
\node (b) at (19bp,79bp) [draw,circle,] {$b$};
\node (c) at (71bp,49bp) [draw,circle,] {$c$};
\draw [] (a) -- (b);
\draw [] (b) -- (c);
\draw [] (c) -- (a);
```

The code is much more compact and it is quite easy to modify the graph.

1.4.7 The dot2texi LaTeX package

The dot2texi package allows you to embed DOT graphs directly in you LaTeX document. The package will automatically run `dot2tex` for you and include the generated code. Example:

```
\documentclass{article}
\usepackage{dot2texi}

\usepackage{tikz}
\usetikzlibrary{shapes,arrows}

\begin{document}
\begin{dot2tex}[neato,options=-tmath]
digraph G {
    node [shape="circle"];
    a_1 -> a_2 -> a_3 -> a_4 -> a_1;
    }
\end{dot2tex}

\end{document}
```

When the above code is run through LaTeX, the following will happen is shell escape is enabled:

- The graph is written to file.
- `dot2tex` is run on the DOT file.
- The generated code is included in the document.

The whole process is completely automated. The generated graph will look like this:

The `codeonly` option is useful in conjunction with `dot2texi`, especially when used with the `tikz` output format. Here is an example that shows how to annotate a graph:

```
\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{arrows,shapes}
\usepackage{dot2texi}
\begin{document}
% Define layers
```

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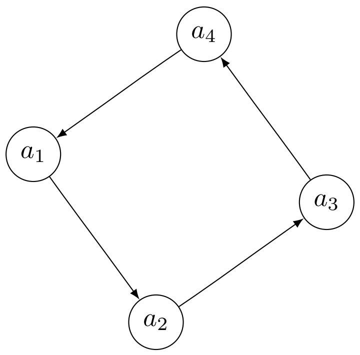

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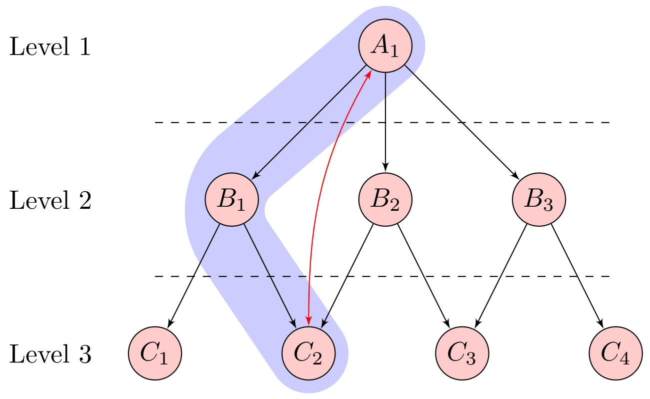
```
\pgfdeclarelayer{background}
\pgfdeclarelayer{foreground}
\pgfsetlayers{background,main,foreground}

% The scale option is useful for adjusting spacing between nodes.
% Note that this works best when straight lines are used to connect
% the nodes.
\begin{tikzpicture}[>=latex',scale=0.8]
    % set node style
    \tikzstyle{n} = [draw,shape=circle,minimum size=2em,
                        inner sep=0pt,fill=red!20]
    \begin{dot2tex}[dot,tikz,codeonly,styleonly,options=-s -tmath]
        digraph G  {
            node [style="n"];
            A_1 -> B_1; A_1 -> B_2; A_1 -> B_3;
            B_1 -> C_1; B_1 -> C_2;
            B_2 -> C_2; B_2 -> C_3;
            B_3 -> C_3; B_3 -> C_4;
        }
    \end{dot2tex}
    % annotations
    \node[left=1em] at (C_1.west)  (l3) {Level 3};
    \node at (l3 |- B_1) (l2){Level 2};
    \node at (l3 |- A_1) (l1) {Level 1};
    % Draw lines to separate the levels. First we need to calculate
    % where the middle is.
    \path (l3) -- coordinate (l32) (l2) -- coordinate (l21) (l1);
    \draw[dashed] (C_1 |- l32) -- (l32 -| C_4);
    \draw[dashed] (C_1 |- l21) -- (l21 -| C_4);
    \draw[<->,red] (A_1) to[out=-120,in=90] (C_2);
    % Highlight the A_1 -> B_1 -> C_2 path. Use layers to draw
    % behind everything.
    \begin{pgfonlayer}{background}
        \draw[rounded corners=2em,line width=3em,blue!20,cap=round]
                (A_1.center) -- (B_1.west) -- (C_2.center);
    \end{pgfonlayer}
\end{tikzpicture}
\end{document}
```

Note: If you don't want to include the dot directly in your document, you can use the `\input{..}` command. See the section *Including external dot files* for more details.



1.5 Using dot2tex as a module

It is possible to load dot2tex as a module for use in other Python programs. Here is a basic example:

```
import dot2tex
testgraph = """
digraph G {
    a -> b -> c -> a;
}
"""
texcode = dot2tex.dot2tex(testgraph, format='tikz', crop=True)
```

The `dot2tex` function is the main interface:

```
dot2tex(dotsource,**kwargs)
```

It takes the following input arguments:

Argument	Description
`dotsource`	A string containing a DOT or XDOT graph.
`**kwargs`	An arbitrary number of conversion options passed as keyword arguments

The function returns the resulting LaTeX code as a string.

The supported options are the same as the *command line options* (long version). Here are a few examples:

```
import dot2tex as d2t
texcode = d2t.dot2tex(testgraph, format='tikz', crop=True)
texcode = d2t.dot2tex(testgraph, preproc=True,figonly=True)
texcode = d2t.dot2tex(testgraph, debug=True)
```

Option values are either strings or booleans. Note that some of the command line options are not relevant when using dot2tex as a module.

To specify a template you can use the `template` option like this:

```
import dot2tex
mytemplate = "<<drawcommands>>"
texcode = dot2tex.dot2tex(graph, template = mytemplate)
```

1.5.1 Debugging

You can set `debug=True` to create a detailed log useful for debugging. To retrieve the content of the log you can use the `get_logstream` function. It will return a `StringIO` instance. You can then use the `getvalue()` class method to get the actual text. Example:

```
import dot2tex
texcode = dot2tex.dot2tex(testgraph, debug=True)
logstream = dot2tex.get_logstream()
print logstream.getvalue()
```

1.5.2 The `positions` output format

When you use dot2tex as a module you have access to the special `positions` output format if you use `format=positions`. The `dot2tex` function will then return dictionary with node name as key and a (x, y) tuple with the center position of the node as value:

```
>>> import dot2tex
>>> testgraph = """
... digraph G {
...     a -> b -> c -> a;
... }
"""
>>> dot2tex.dot2tex(testgraph, format='positions')
{'a': [54, 162], 'b': [27, 90], 'c': [54, 18]}
```

CHAPTER 2

Additional notes

2.1 dot2tex change log

Here you can see the full list of changes between each dot2tex release.

2.1.1 2.11.3

Released 2019-03-31

- Ignore multiline edge labels during preprocessing (issue #27)
- Fixed parsing of DOT IDs. Numerals can now be used as node IDs.
- Fixed issue #64. Remove characters from drawsting.

2.1.2 2.11.2

- Added support for the circle node shape. Thanks to Alexander Hagen for the pull request.
- Fix Popen issue on windows 10 when calling latex. The –autosize option is now working again.

2.1.3 2.11.1

Released 2019-03-15

- Fix bug in setup.py entry_points.

2.1.4 2.11.0

Released 2019-03-15

- Added support for Python 3! Thanks Travis Scrimshaw!

- Various bug fixes.

2.1.5 2.10.dev

Not released

- Convert input file to output file only if latter is outdated. Can be overridden by the new –force command line option.
- Replaced deprecated opt parse with argparse.
- Python 2.7.x is now a requirement (due to the use of the argparse module)

2.1.6 2.9.1

Not released

- Preprocessing head and tail labels now works in the `duplicate` mode.
- Added support for preprocessing head and tail labels (pstricks).
- Relaxed syntax for including external dot files. Comments are now allowed after `\input{}`.
- All xdot coordinates are now parsed as float (issue #31).
- Added the svgnames option when loading xcolor in the default templates (issue #25).

2.1.7 2.9.0

Released 2014-05-16.

- Added support for preprocessing head and tail label (pgf and tikz).
- Graphviz arrow styles are now mapped to corresponding PGF/TikZ arrows.
- Project is now hosted on GitHub.
- Numbers are now outputted as floats. Some versions of Graphviz uses scientific notation for small numbers. TeX does not handle that well [issue #11].
- Added support for more Graphviz node shapes when using the tikz output format: square, diamond, trapezium and star.
- Fixed compatibility issue with Pyparsing 2.0.1.
- Fixed a bug in preprocessing triggered by using the `--styleonly` option with the tikz output format.
- The number of sides in the hexagon tikz shape is now correct. Thanks to Jean Pichon for reporting this.
- Added support for the point shape when using the TikZ output format.
- Node labels are no longer shown when the node shape is point and the output format is TikZ.
- Fixed issue 14. Parsing of dimension data from the TeX-log is now more robust and the `--autosize` option should now work in Cygwin.
- Added the `--progoptions` option for passing options to the graph layout program.
- Documentation is now built using Sphinx
- Cleaned up internal error handling.

- When dot2tex fails to parse a graph, dot2tex will now raise an exception and quit. In previous versions dot2tex attempted to run the graph through Graphviz first.
- Log handlers are no longer configured when using dot2tex as a library.
- Fixed [issue 20]. `format=positions` no longer fails if node coordinates are floats. Thanks to Nicolas Thiery for reporting this bug.
- Fixed several bugs in the parsing of ID numerals. The bug caused labels like `label="1.2.3.4"` to be interpreted as `label=1.2` [issue 17]. Thanks to Vsevolod for reporting this.
- `stdout` is now properly restored after parsing dot data. Thanks to Nicolas Thiery for the patch.
- Parentheses, `()`, in tikz node names are now replaced with `{}`. Parentheses are not valid characters in node names. Thanks DamienJadeDuff for reporting this.

2.1.8 2.8.7

Released 2009-10-05.

- Edges with no edge points are now properly handled.
- Added the `positions` output format that returns a dictionary with node names as keys and (x, y) tuples as values. Works only when called as a module. Feature suggested by Nicolas Thiery.
- Fixed handling of `stderr` when creating xdot data. Thanks to Nicolas Thiery for reporting this bug.
- Exceptions are now caught when accessing invalid win32 registry keys. Updated Graphviz registry key. Thanks Andreas Frische for reporting this.
- Fixed templates so that crop code is not inserted when preprocessing the graph.

2.1.9 2.8.6

Released 2009-07-09.

- Added the `--pgf118` option for generating code compatible with PGF 1.18 and earlier.
- Fixed a bug in handling of the special `d2toptions` attribute. It was read even when commented out. Thanks Misha Aizatulin for reporting this.
- Fixed label alignment issues when using recent versions of Graphviz.
- Silenced os.popen3 deprecation warning in Python 2.6.
- Fixed bug in handling of d2toption when dot2tex was used as a module.

2.1.10 2.8.5

Released 2009-03-02

- Updated TikZ/PGF templates to use `line join=bevel` instead of `join=bevel`. The name of the option was changed in PGF 2.0 and `join` is now used by TikZ's chain library. The change will break PGF 1.18 compatibility.
- Unquoted unicode strings are now correctly parsed.

2.1.11 2.8.4

Released 2008-09-23.

- Fixed a really stupid bug in the quoting of the Graphviz binaries. The code in the 2.8.3 release did not quote the binaries at all. Thanks Peter Collingbourne for spotting this!

2.1.12 2.8.3

- File paths to the Graphviz executables are now quoted. This solves an issue with paths containing spaces. Thanks Pedro Teixeira and Mateusz for reporting this.
- Fixed a template typo. Dot2tex looks for the `<<start_figonlysection>>`, but `<<startfigonlysection>>` is used in the documentation. Now both versions can be used.
- Added `--cache` command line option. If caching is enabled, dot2tex will check if the input graph has been processed before. If it has not changed the graph will not be converted (not documented yet).

2.1.13 2.8.2

- Fixed a parsing bug in the detection of output format in cases like:

  ```
  dot2tex --preproc example.dot | dot2tex
  ```

  Thanks Peter Collingbourne for the patch!
- Removed obsolete shebang line from dot2tex.py

2.1.14 2.8.1

- Fixed a severe bug in the preprocessing code for the tikz output format.

2.1.15 2.8.0

Released 2008-05-05.

- Node names are now filtered to ensure that they are valid TikZ node names.
- Correct fill and stroke color is now set when using the tikz and pst output formats.
- Invisible nodes now generate zero-size coordinates when using the tikz output format. This allows drawing edges to/from invisible nodes.
- Added dropshadows.dot and sportsbracket.dot examples.
- Concentrated edges are now supported in the pgf and pstricks output formats.
- The dot parser now correctly parses quoted string like:

  ```
  label="A \"quote\""
  label="\n\nA"
  ```

- The dot parser now supports concatenation of double quoted strings using the + character. Example:

  ```
  a [label="partA" + "partB" + "partC"];
  ```

- Added support for edge compass points when using the tikz output format. Example: `a.n -> b.e` is translated to `\draw (a.north) ... (b.east)`
- The external pydot module has been replaced with a custom version of the pydot's dot parser. Available in the dotparsing.py file.
- Added support for file input. If the input data contains the line `\input{filename.dot}` filename.dot will be loaded and processed. (Thanks Kim Sullivan for the idea)
- Added interface for using dot2tex as a library. Example:

```
import dot2tex
testgraph="digraph G {a_1-> a_2 -> a_3 -> a_1;}"
texcode = dot2tex.dot2tex(testgraph,format='tikz',crop=True)
```

2.1.16 2.7.0

Released 2007-12-10.

- Added the `--codeonly` option. When this option is used, only draw commands are generated. Intended for use with the dot2texi package.
- Minor improvements to the documentation.
- Added `graphanndtti.tex` example.

2.1.17 2.6.1

- Fixed missing header in the file dot2tex/dotex
- Fixed various typos in the documentation

2.1.18 2.6.0

Released 2007-09-14.

- Added the `--autosize` option. Equivalent to:

```
> dot2tex --preproc ex.dot | dot2tex
```

- Added the `--prog` option for choosing between dot, neato, circo, towpi and fdp, when the input is in plain dot format.
- Added the special `d2toptions` graph attribute. Allows you to specify dot2tex options in command line format.
- Added a dot2tex wrapper script and changed setup.py to make it fully compatible with both setuptools and distutils. A dot2tex module will now be put in the site-packages directory and a wrapper script in the scripts directory.
- Fixed typo in error message.
- Added `--runtests` option to run doc tests (experimental).
- Fixed issue with wrong template when both the –preview and –figonly options were used.

2.1.19 2.5.0

Released 2007-07-28.

- Added the TikZ output format (`-f tikz`)
- Added the `lblstyle` attribute for styling graph, node and edge labels. (PGF and TikZ only)
- Added the `--tikzedgelabels` option for placing edge labels without using xdot edge label information (tikz and pgf output format only).
- Added a topath edge attribute for using TikZ' to paths (tikz and pgf only).
- Information about the selected output format is now stored in the graph generated in preprocessing mode. No longer necessary to specify an output format in the final run.
- Edges with the same source and dest are now handled correctly in preprocessing mode. Only the edge defined last was preprocessed.
- Added the `--nodeoptions` and `--edgeoptions` options and corresponding `d2tnodeoptions` and `d2tedgeoptions` graph attribute (tikz only).
- Added the `exstyle` attribute. Ignored in preprocessing mode. (pgf and tikz only)

2.1.20 2.0.3

- Special TeX char escape code rewritten. Now works as intended. The `$` character was not properly escaped.
- Added `&` to list of special characters.

2.1.21 2.0.2

- Fixed a severe bug in the interpretation of color attributes in edges. Colors were not reset after a change to a single edge color.

2.1.22 2.0.1

- Node margins are now interpreted correctly for nodes with size < minsize.
- Nodes now grow correctly to fit labels when size > minsize
- Updated documentation with an example on how to change node sizes.

2.1.23 2.0.0

Released 2007-04-23

- Fixed a number of preprocessing bug related to how node attributes are interpreted.
- Added automata.dot example.
- Changed the name of the `--preview` option to `--crop`.
- Added the –preproc option for preprocessing labels with preview.sty.
- Added the –debug option. Writes detailed debug information to dot2tex.log.
- The ^ char is now properly escaped.

- Default PGF/TikZ template now requires PGF v >= 1.09.
- Added new template tags to support preprocessing mode.
- Templates for preprocessing, output and figonly mode can now be put in the same file.
- Added the `--alignstr` option.
- Added the `--valignmode` option.
- Added the `--usepdflatex` option.

2.1.24 1.5.0

Released 2006-10-22

- Added a few more helpfull error messages.
- Added the `--figonly` option.
- The `$` character is now properly escaped.
- Fixed a few issues when converting between Graphviz to backend styles.
- Fixed scoping issues when drawing edges in duplicate mode.
- Added more intelligent detection of xdot input. Older versions of Graphviz does not include the `xdotversion` attribute in the output.
- Styles are now transfered to the PSTricks and PGF/TikZ backend.
- Added a force straight line option to avoid using curves for straight edges.
- PGF/TikZ is now set as the default backend.
- Fixed a line ending issue in data converted internally to the xdot format.
- Added the `-V` version command line switch
- Added the `--encoding` option
- Added option for switching node and graph draw order.
- Fixed bug in PGF/TikZ color handling
- Added the `--preview` option to crop graphs
- Added `--figpreamble` and `--figpostamble` options and graph attributes.
- Added `--docpreamble` option and `d2tdocpreamble` graph attribute
- Added `--graphstyle` option
- Added `--gvcols` option
- Changed default PGF/TikZ arrow type to >=latex'

2.1.25 1.0.1

- Fixed bug in gvcols.tex

2.1.26 1.0.0

Released 2006-09-10

- First public release.

2.2 License

Dot2tex is licensed under the MIT licence. It basically means that you can do whatever you want with it as long as you keep the copyright license in all copies or substantial portions of the software. See *below* for details.

2.2.1 Authors

Dot2tex is written and maintained by Kjell Magne Fauske. The dot language parser is mainly written by Michael Krause.

Patches and suggestions

- Nicolas Thiery
- Peter Collingbourne
- Michael Krause
- Ero Carrera
- Michael Niedermair
- Ioannis Filippidis
- Travis Scrimshaw

2.2.2 The dot2tex license

CHAPTER 3

Acknowledgements

The dot parser used by dot2tex is based on code from the pydot project.

CHAPTER 4

Indices and tables

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