

# Examples of Code Listings in L<sup>A</sup>T<sub>E</sub>X

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## Abstract

This project is meant to help jump start writers looking to display source code in L<sup>A</sup>T<sub>E</sub>X documents. The project provides a set of T<sub>E</sub>X files and a PDF of the output of said T<sub>E</sub>X files. The intention is that a reader may view the various code listing demonstrations in the PDF, and then read, learn, or simply copy the L<sup>A</sup>T<sub>E</sub>X necessary to display their code in the same manner. Basic knowledge of L<sup>A</sup>T<sub>E</sub>X is assumed.

We display code using the following: `verbatim`, `listings` (not to be confused with `listing`), and `minted`.

To avoid a monolithic L<sup>A</sup>T<sub>E</sub>X document and make perusing the code simpler, each subsection is it's own T<sub>E</sub>X file, as is the preamble.

Note that all code is licensed under the Simplified BSD License, a copy of which is included with the project code, found [on github](#).

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# 1 Basic Tools and Techniques for Listing Code

## 1.1 `verbatim` Environment

Here is an example that uses L<sup>A</sup>T<sub>E</sub>X's `verbatim` environment.

```
from django.db import models

class Poll(models.Model):
    question = models.CharField(max_length=200)
    pub_date = models.DateTimeField('date published')

class Choice(models.Model):
    poll = models.ForeignKey(Poll)
    choice_text = models.CharField(max_length=200)
    votes = models.IntegerField(default=0)
```

Note that the quotes used are standard programming quotes, as opposed to L<sup>A</sup>T<sub>E</sub>X's backtick-quote combination. This is possible because of the `upquote` package, included in the preamble of the document.

L<sup>A</sup>T<sub>E</sub>X further supplies the `\verb` command, allowing for inline formatting.

On a related note, note that the `\verb` command can only be used in captions if the entire command is preceded by the `\cprotect` command, included in the `cprotect` package, which you can read more about [on the documentation provided by CTAN](#). An example is demonstrated in the caption of listing 1.3.1 on page 4.

Finally, text in chapter titles (or section, subsection, etc) are formatted with `\texttt` in this document, as the use of `\verb` in these areas appears to conflict with the `hyperref` package. We could use `\texttt` in captions as well, but that would defeat our purpose of demonstrating all the tools.

## 1.2 `listings` Package

The following uses the `listings` package to create an environment.

Code Example 1.2.1: `models.py` from Django Tutorial using Listings

```
1 from django.db import models
2
3 class Poll(models.Model):
4     question = models.CharField(max_length=200)
5     pub_date = models.DateTimeField('date published')
6
7 class Choice(models.Model):
8     poll = models.ForeignKey(Poll)
9     choice_text = models.CharField(max_length=200)
10    votes = models.IntegerField(default=0)
```

On top of an environment, the `listings` package also provides a way to format inline text using `\lstinline{}`, replacing the `verb` command. Note that the settings for `\lstinline{}` must be set in the options of `\lstset{}` in the preamble. For more on the `listings` package, please see [the wikibook on the subject](#), or else [the documentation provided by CTAN](#). Note that while not discussed here, it is possible to create a list of listings (a table of contents of all the listings).

### 1.3 Minted Package

The last environment I'll demonstrate is the `minted` package. It takes code in the environment, and runs it through Python's `pygments` library. The resulting colored  $\text{\LaTeX}$  syntax is placed in a `verbatim` environment.

```
from django.db import models

class Poll(models.Model):
    question = models.CharField(max_length=200)
    pub_date = models.DateTimeField('date published')

class Choice(models.Model):
    poll = models.ForeignKey(Poll)
    choice_text = models.CharField(max_length=200)
    votes = models.IntegerField(default=0)
```

While `minted` does not provide an inline formatting command, it does provide a shortcut command `mint` for short code snippets.

```
fib = lambda n: n if n < 2 else fib(n-1) + fib(n-2)
```

The minted environment also provides the ability to be inserted into listings, with labels and captions.

```
from django.db import models

class Poll(models.Model):
    question = models.CharField(max_length=200)
    pub_date = models.DateTimeField('date published')

class Choice(models.Model):
    poll = models.ForeignKey(Poll)
    choice_text = models.CharField(max_length=200)
    votes = models.IntegerField(default=0)
```

Code Example 1.3.1: `models.py` from Django Tutorial using Minted

## 2 Custom Environments and Macros

This section will demonstrate various macros defined in the preamble that you can use to make your document clearer.

### 2.1 Aside

While not for code, per se, this aside environment demonstrates the use of the `mdframed` package.

#### Aside - Lorem Ipsum Example

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

## 2.2 Python Code Macro

Here is an example of the macro in the preamble for listing Python code.

Code Example 2.2.1: `models.py` using Minted Macro  
File: `/models.py`

```
0  from django.db import models
1
2  class Poll(models.Model):
3      question = models.CharField(max_length=200)
4      pub_date = models.DateTimeField('date published')
5
6  class Choice(models.Model):
7      poll = models.ForeignKey(Poll)
8      choice_text = models.CharField(max_length=200)
9      votes = models.IntegerField(default=0)
```

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