

# 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

The `verbatim` environment, supplied by  $\text{\LaTeX}$ , is the most basic environment a writer may use to display source code. Below is an example.

```
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)
```

The `verbatim` environment is important, as it is the basis for all other code listing environments demonstrated in this document. This means that packages that affect `verbatim` listings will also affect these other listings.

For example, the `upquote` package, which allows for normal single quotes usage in `verbatim` environments (as opposed to  $\text{\LaTeX}$ 's backtick-quote combination), will work in listings and `minted` environments, because they are built on top of `verbatim`. [Read more about `upquote` at CTAN.](#)

### 1.1.1 **verb** Command

Along with the environment,  $\text{\LaTeX}$  supplies the inline `\verb` command, which is used on and off throughout the document to format the names of packages and environments.

Note, however, that the `\verb` command should be used in neither headings (such as `\section`) nor captions. Use of `\verb` in captions causes compilation errors. Use of `\verb` in headings will cause problems with the `hyperref` package, and may lead to over- or under- full box errors.

Instead, use the `\texttt` command, as demonstrated in the headings of this document.

If you absolutely must use `\verb` in a caption, you may import the `cprotect` package, which you can read more about [on the documentation provided by CTAN](#), and precede the caption with the `\cprotect` command. Code Example 1.3.3 on page 4 demonstrates usage.

## 1.2 listings Package

The `listings` (plural) package provides the `lstlisting` environment, which is a more sophisticated method for displaying source code. The environment will bold keywords, and comes with a slew of options, including the ability to add to the list of keywords. The environment also makes it easy to organize code listings, providing options for a caption and a label.

The example below opts to frame the entire example, displaying line numbers starting at 1, and declaring `caption` and `label` options.

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)
```

To avoid duplication of settings at each code listing, the `listings` package provides a way of defining styles in the preamble, using the `\lstdefinestyle` command, which can then be invoked at the declaration of the `lstlisting` environment.

To print a list of code listings, the `listings` package provides the `\lstlistoflistings` command. This document does not make use of this. Please see FILL IN LATER for information about the method used in this document.

For more on the `listings` package, please see [the wikibook on the subject](#), or else [the documentation provided by CTAN](#).

### 1.2.1 `lstinline` Command

On top of an environment, the `listings` package also provides a way to format inline text using `\lstinline`, much like the `\verb` command. Note that the settings for `\lstinline` must be set in the options of `\lstset` in the preamble.

### 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 L<sup>A</sup>T<sub>E</sub>X 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 1.3.3: `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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