

The `uvlhighlight` Package

Syntax Highlighting for Universal Variability Language

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Abstract

The `uvlhighlight` package provides syntax highlighting for the Universal Variability Language (UVL) in \LaTeX . It is based on the `listings` package and supports all UVL keywords. The package includes multiple visual themes (default, Flamapy, UVLS dark mode, and black & white) and provides inline commands for semantic highlighting. It also supports user-defined features' attributes and the inclusion of external `.uvl` files.

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1 Introduction

The *Universal Variability Language* (UVL) [1] is increasingly used in Software Product Line Engineering. However, L^AT_EX lacks native support for properly formatting UVL models.

The `uvlhighlight` package addresses this limitation by providing:

- Syntax highlighting.
- Multiple visual themes.
- Inline semantic commands.
- Integration with `listings`.

2 Installation

The package is available on CTAN and can be installed via your T_EX distribution (e.g., TeX Live or MiKTeX). Alternatively, you can install it manually:

- Download the package from CTAN.
- Place `uvlhighlight.sty` in your local T_EX tree.
- Refresh the file database.

3 Quick Start

Here is a minimal working example to start using the `uvlhighlight` package:

```
\documentclass{article}
\usepackage{uvlhighlight}

\begin{document}

\begin{lstlisting}[language=UVL]
features
  Pizza
    optional
      Cheese
\end{lstlisting}

\end{document}
```

4 Package Options

You can customize the appearance and typography of the UVL code by passing one of the following options:

default (No option) Loads the standard color theme (Purple/Blue/Orange/Green) suitable for white backgrounds.

flamapy Loads the theme based on the Flamapy ecosystem (Blue/Red/Green).

uvs Loads a Dark Theme inspired by the Visual Studio Code UVL plugin (requires a dark background, which is set automatically).

bw Loads a high-contrast Black & White theme, optimized for academic papers and printing.

beramono (Default) Loads the *Bera Mono* font. A more compact, slightly rounded monospaced font.

inconsolata Loads the *Inconsolata* font. It is highly recommended for modern look and perfect bold support in L^AT_EX.

nofont Disables automatic font loading. The package will use `lmodern` as a fallback to ensure that bold styles are correctly rendered even if you use the default L^AT_EX typewriter font.

5 User Interface

5.1 Commands

5.1.1 Custom attributes: `\uvlattributes`

UVL models often contain domain-specific attributes (e.g., `Price`, `Weight`, `Latency`). To highlight these words specifically, use this command in your preamble.

```
\uvlattributes{Kcal, Price}
```

5.1.2 Inline Formatting Commands

The following commands are defined by the package to easily highlight UVL elements within the regular text of your document, applying the colors defined by the currently selected theme.

`\UVL` Write the acronym UVL following the style of the official paper.

`\UVLKeyword{text}` Applies the **Keyword** color (`alternative`, `mandatory`, etc.) and monospaced font.

`\feature{text}` Applies the **Feature** color (`Pizza`, `Topping`, etc.) and monospaced font.

`\attribute{text}` Applies the **Attribute** color (`Price`, `Kcal`, etc.) and monospaced font.

`\constraint{text}` Applies monospaced font for entire constraint expressions.

Example:

Inline Formatting Example

Source:

```
The \attribute{Price} attribute is used in the constraint \constraint{sum(Price) < 12}. The feature \feature{Pizza} uses the \UVLKeyword{optional} keyword of \UVL.
```

Result:

The `Price` attribute is used in the constraint `sum(Price) < 12`. The feature `Pizza` uses the `optional` keyword of UVL.

5.2 Environments

5.2.1 `lstlisting` with UVL

You can use the standard `lstlisting` environment with `language=UVL`:

```

\begin{lstlisting}[language=UVL, caption={Simple Example}]
features
  /* Multi-line
  comment example */
Pizza {abstract}
  optional
  CheesyCrust {Kcal 370, Price 1.00}
  Integer SpicyLvl
  String Name // Esto es un comentario
  mandatory
  Topping {abstract}
  or
  Salami {Kcal 462}
  Ham {Kcal 115}
  Mozzarella {Kcal 310}
  Anchovies {Kcal 210, Price 0.50}
  Size {abstract}
  alternative
  "Normal size" {Price 8.00}
  Big {Price 12.00}
  Dough {abstract}
  alternative
  Neapolitan
  Sicilian {Price 0.50}
constraints
(CheesyCrust & Sicilian) => Big
Neapolitan => (!Salami & !Ham)
sum(Price) < 12
Name => len(Name)<10 & Name=='Margherita'
SpicyLvl >= 1 & SpicyLvl <= 5
SpicyLvl==5 => SpicyLvl.Price==1.00
(SpicyLvl>=1 & SpicyLvl<5) => SpicyLvl.Price==0
\end{lstlisting}

```

5.2.2 `\inputuwl`

This command imports an external `.uwl` file and formats it as a UVL code block. It accepts optional arguments compatible with `lstinputlisting`.

```
\inputuwl[caption={My Model}, label={lst:model}]{model.uwl}
```

6 Examples

6.1 Typography Gallery

The package supports different monospaced fonts optimized for code.

- **Bera Mono (Default):** MyFeature cardinality [1..*] {Price 2.50}
- **Inconsolata:** MyFeature cardinality [1..*] {Price 2.50}
- **Latin Modern (Fallback):** MyFeature cardinality [1..*] {Price 2.50}

6.2 Theme Gallery

Below is a demonstration of the same UVL model rendered using the four available themes.

6.2.1 Default Theme

This is the default style loaded with `\usepackage{uvlhighlight}`.

Listing 1: Pizza Model (Default Theme).

```

1 features
2  /* Multi-line
3  comment example */
4  Pizza {abstract}
5    optional
6      CheesyCrust {Kcal 370, Price 1.00}
7      Integer SpicyLvl
8      String Name // Esto es un comentario
9    mandatory
10     Topping {abstract}
11     or
12       Salami {Kcal 462}
13       Ham {Kcal 115}
14       Mozzarella {Kcal 310}
15       Anchovies {Kcal 210, Price 0.50}
16     Size {abstract}
17     alternative
18       "Normal size" {Price 8.00}
19       Big {Price 12.00}
20     Dough {abstract}
21     alternative
22       Neapolitan
23       Sicilian {Price 0.50}
24 constraints
25   (CheesyCrust & Sicilian) => Big
26   Neapolitan => (!Salami & !Ham)
27   sum(Price) < 12
28   Name => Len(Name)<10 & Name=='Margherita'
29   SpicyLvl >= 1 & SpicyLvl <= 5
30   SpicyLvl==5 => SpicyLvl.Price==1.00
31   (SpicyLvl>=1 & SpicyLvl<5) => SpicyLvl.Price==0

```

6.2.2 Flamapy Theme

Activated via `\usepackage[flamapy]{uvlhighLight}`.

Listing 2: Pizza Model (Flamapy Theme).

```

1 features
2  /* Multi-line
3  comment example */
4  Pizza {abstract}
5    optional
6      CheesyCrust {Kcal 370, Price 1.00}
7      Integer SpicyLvl
8      String Name // Esto es un comentario
9    mandatory
10     Topping {abstract}
11     or
12       Salami {Kcal 462}
13       Ham {Kcal 115}
14       Mozzarella {Kcal 310}
15       Anchovies {Kcal 210, Price 0.50}
16     Size {abstract}
17     alternative
18       "Normal size" {Price 8.00}
19       Big {Price 12.00}
20     Dough {abstract}
21     alternative
22       Neapolitan
23       Sicilian {Price 0.50}
24 constraints
25   (CheesyCrust & Sicilian) => Big
26   Neapolitan => (!Salami & !Ham)
27   sum(Price) < 12
28   Name => Len(Name)<10 & Name=='Margherita'
29   SpicyLvl >= 1 & SpicyLvl <= 5

```

```

30 SpicyLvl==5 => SpicyLvl.Price==1.00
31 (SpicyLvl>=1 & SpicyLvl<5) => SpicyLvl.Price==0

```

6.2.3 UVLS Theme (Dark Mode)

Activated via `\usepackage[uvls]{uvlhighlight}`. This style mimics the Visual Studio Code plugin.

Listing 3: Pizza Model (UVLS Dark Theme).

```

1 features
2 /* Multi-line
3 comment example */
4 Pizza {abstract}
5   optional
6     CheesyCrust {Kcal 370, Price 1.00}
7     Integer SpicyLvl
8     String Name // Esto es un comentario
9   mandatory
10    Topping {abstract}
11    or
12      Salami {Kcal 462}
13      Ham {Kcal 115}
14      Mozzarella {Kcal 310}
15      Anchovies {Kcal 210, Price 0.50}
16    Size {abstract}
17    alternative
18      "Normal size" {Price 8.00}
19      Big {Price 12.00}
20    Dough {abstract}
21    alternative
22      Neapolitan
23      Sicilian {Price 0.50}
24 constraints
25 (CheesyCrust & Sicilian) => Big
26 Neapolitan => (!Salami & !Ham)
27 sum(Price) < 12
28 Name => len(Name)<10 & Name=='Margherita'
29 SpicyLvl >= 1 & SpicyLvl <= 5
30 SpicyLvl==5 => SpicyLvl.Price==1.00
31 (SpicyLvl>=1 & SpicyLvl<5) => SpicyLvl.Price==0

```

6.2.4 Black & White Theme

Activated via `\usepackage[bw]{uvlhighlight}`. Optimized for printed academic papers.

Listing 4: Pizza Model (B&W Theme).

```

1 features
2 /* Multi-line
3 comment example */
4 Pizza {abstract}
5   optional
6     CheesyCrust {Kcal 370, Price 1.00}
7     Integer SpicyLvl
8     String Name // Esto es un comentario
9   mandatory
10    Topping {abstract}
11    or
12      Salami {Kcal 462}
13      Ham {Kcal 115}
14      Mozzarella {Kcal 310}
15      Anchovies {Kcal 210, Price 0.50}
16    Size {abstract}
17    alternative
18      "Normal size" {Price 8.00}

```

```

19     Big {Price 12.00}
20     Dough {abstract}
21     alternative
22     Neapolitan
23     Sicilian {Price 0.50}
24 constraints
25 (CheesyCrust & Sicilian) => Big
26 Neapolitan => (!Salami & !Ham)
27 sum(Price) < 12
28 Name => len(Name)<10 & Name=='Margherita'
29 SpicyLvl >= 1 & SpicyLvl <= 5
30 SpicyLvl==5 => SpicyLvl.Price==1.00
31 (SpicyLvl>=1 & SpicyLvl<5) => SpicyLvl.Price==0

```

7 License

This package is distributed under the terms of the [L^AT_EX Project Public License \(LPPL\)](#), version 1.3c.

8 Changelog

- Version 1.3 (13th Apr 2026)
 - Add new UVL inline command.
- Version 1.2 (16th Feb 2026)
 - Support for compatible typography.
- Version 1.1 (2nd Dec 2025)
 - Add inline commands.
- Version 1.0 (1st Dec 2025)
 - Initial version of the package.

References

- [1] David Benavides, Chico Sundermann, Kevin Feichtinger, José A. Galindo, Rick Rabiser, and Thomas Thüm. UVL: Feature modelling with the universal variability language. *Journal of Systems and Software*, 225:112326, 2025.