`fox-listings` — LaTeX `listings` language definition for COSYScript (COSY INFINITY)

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2026/02/28 v1.0

1 Introduction

The `fox-listings` package provides a language definition for the `listings` package to typeset source code in COSYScript, the programming language of the COSY INFINITY beam physics and differential algebra (DA) framework developed at Michigan State University. COSYScript is compiled and executed by the FOXY subsystem; source files use the `.fox` extension, and the language is often referred to informally as "FOX." This package uses the name `FOX` for the `listings` language identifier and style prefixes.

The package defines six keyword groups that can be independently styled, supports nested {...} comments and single-quoted string literals, and provides two ready-made styles.

2 Usage

Load the package after `listings`:

```
\usepackage{fox-listings}
```

The package automatically loads `listings` and `xcolor`.

2.1 Color style

```
\begin{lstlisting}[style=FOXcolor]
  ...
\end{lstlisting}
```

2.2 Monochrome style

```
\begin{lstlisting}[style=FOXmono]
  ...
\end{lstlisting}
```

2.3 Language only (custom style)

```
\begin{lstlisting}[language=FOX]
  ...
\end{lstlisting}
```

2.4 Inline code

```
\lstinline[language=FOX]{VARIABLE X 1 ;}
```

3 Keyword groups

Group	Category	Examples
1	Control flow, declarations	PROCEDURE, IF, VARIABLE, WRITE
2	Intrinsic functions	SIN, SQRT, ABS, CONS, DA
3	Intrinsic procedures	DAINI, VELSET, CONFIG_SET
4	Beam physics	OV, MQ, CR, FR, ER
5	Graphics	GRMOVE, GRDRAW, GREPS, PP
6	Constants/globals	PI, CLIGHT, MAP, RAY

4 Examples

4.1 Color style (FOXcolor)

```
INCLUDE 'COSY' ;
VARIABLE X 1 ;
VARIABLE Y 1 ;

{Compute and display a value}
X := SIN(0.5) ;
Y := SQRT(X) + 1 ;
WRITE 6 'Result:' Y ;

PROCEDURE GREET A B ;
   VARIABLE C 1 ;
   C := A + B ;
   WRITE 6 'Sum =' C ;
ENDPROCEDURE ;

GREET 3 4 ;

OV 3 2 0 ;
UM ;
MQ 0.5 0.1 ;
CR ;
PP -10 10 -10 10 ;

END ;
```

4.2 Monochrome style (FOXmono)

```
INCLUDE 'COSY' ;
VARIABLE X 1 ;

PROCEDURE ORBIT_FIND ;
   VARIABLE TOL 1 ;
   TOL := 1E-10 ;
   FIT X := 0 ;
      UM ; MQ 0.5 0.1 ; CR ;
   ENDFIT 1E-12 100 1 1 ;
ENDPROCEDURE ;

ORBIT_FIND ;
WRITE 6 'Orbit:' X ;
END ;
```

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