Lisp on TEX

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Usage: `\usepackage{lisp-on-tex}`

Syntax

Kinds	Literals
CONS Cell	‘(‘ *obj* ... ‘.‘ *obj* ‘)‘, ‘(‘ *obj* ... ‘)‘
Integer	‘:‘ *TeX’s integer*
String	‘’‘ *TeX’s balanced tokens* ‘’‘
Symbol	*TeX’s control sequence*
Boolean	‘/t‘ or ‘/f‘
Nil	‘()‘
Skip	‘@‘ *TeX’s skip*
Dimen	‘¡ *TeX’s dimen*

Definition

```
\define : Define a symbol.
\defineM : Define a mutable symbol.
\setB : Rewrite a mutable symbol.
\defmacro : Define a macro.
\macroexpand : Expand a macro
\lambda : Create a function.
\let : Define local symbols.
\letM : Define mutable local symbols.
\letrec : Define local symbols recursively.
```

Control Flow

```
\lispif : Branch.
\begin : Execute expressions.
\callOCC : One-shot continuation.
```

String Manipulations

```
\concat : Concatenate tokens.
\intTOstring : Convert a integer to TeX
    ↪ tokens.
\group : Grouping.
\ungroup : Ungrouping.
\expand : Expand tokens.
```

Arithmetical Functions

```
\+ : Addition.
\- : Subtraction.
\* : Multiplication.
\/ : Division.
\mod : Modulo.
\>, \<, \geq, \leq : Comparison.
\max : Maximum.
\min : Minimum.
```

Logical functions

```
\and, \or, \not : Logical and, or, not
```

Traditional LISP Functions and Special Forms

```
\quote : Quote.
\cons, \car, \cdr : CONS, CAR, CDR
\list : Create a list
\length : Get the size of a LIST.
\map : Map function.
\nth : Get the n-th value of a LIST
    ↪ (starting with 0).
\= : Equality.
\texprint : Convert a object to TeX tokens
    ↪ and output it to the document
\print : (For test) output a object as TeX
    ↪ tokens
```

Type Predicates

```
(\symbolQ (\quote \cs))
(\stringQ 'foo')
(\intQ :42)
(\booleanQ /f)
(\dimenQ !12pt)
(\skipQ @12pt plus 1in minus 3mm)
(\pairQ (\cons :1 :2))
(\nilQ ())
(\funcQ \+)
(\closureQ (\lambda () ()))
(\defmacro (\x) ())
(\macroQ \x)
(\listQ ())
(\listQ (\list :1 :2))
(\atomQ :23)
(\atomQ 'bar')
(\procedureQ \+)
(\procedureQ (\lambda () ()))
(\isZeroQ :0) % /t
(\positiveQ :42) % /t
(\negativeQ :-2) % /t
```

LaTeXUtils

```
\readLaTeXCounter : Read an integer from
    ↪ LaTeX
\message : Wrapper of LaTeX \message
\read : Read a LISP expression from stdin
\fgets : Read a string from stdin.
```

Class Options

Option Name	Meaning
noGC	Never use GC (default)
markGC	Using Mark-Sweep GC
GCopt=...	Passing option to the GC engine

Additional Packages

Fixed Point Numbers

The package `lisp-mod-fpnum` adds fixed point numbers to LISP on TEX. Load it by `\usepackage`:

```
\usepackage{lisp-on-tex}
\usepackage{lisp-mod-fpnum}
```

Regular Expressions

The package `lisp-mod-l3regex` is thin wrapper of `l3regex`. Load it by `\usepackage`:

```
\usepackage{lisp-on-tex}
\usepackage{lisp-mod-l3regex}
```

For details and examples consult the manual.
https://github.com/nilqed/lisp-on-tex