Test listfun.sty

Kurt Pagani

July 28, 2022

Contents

1 Standard functions

1.1 writeList

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \writeList \lst \b \sep \e
%%% -- \lst ......... the list to display
%%% -- \b   ......... the begin character, e.g. '['
%%% -- \sep ......... the separator, e.g. ', '
%%% -- \e   ......... then end character, e.g. ']'
%%% Writes out a list in the form specified.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

(\define \lstA (\list 'a' 'b' '$\delta$' :12 '$\pi$'))
(\define \lstB (\list '\LaTeX' (\list '$\frac{\xi}{\Omega}$' :999) '$\partial\Gamma$'))
%
(\texprint '\begin{center}')
(\writeList \lstA '[' ', ' ']')
(\texprint '\end{center}')
%
(\texprint '\begin{center}')
(\writeList \lstB '[' ', ' ']')
(\texprint '\end{center}')
%
(\texprint '\begin{center}')
(\writeList \lstA '(' ' ' ')')
(\texprint '\end{center}')
%
(\texprint '\begin{center}')
(\writeList \lstB '\{' ' :: ' '\}')
(\texprint '\end{center}')
```

$$[\mathrm{a},\ \mathrm{b},\ \delta,\ 12,\ \pi]$$

$$[\mathrm{LaTeX},\ [\tfrac{\xi}{\Omega},\ 999],\ \partial\Gamma]$$

$$(\mathrm{a}\ \mathrm{b}\ \delta\ 12\ \pi)$$

$$\{\mathrm{LaTeX} :: \{\tfrac{\xi}{\Omega} :: 999\} :: \partial\Gamma\}$$

1.2 equalQ

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \equalQ \x \y
%%% -- \x, \y any lisp type
%%% Tests equality recursively.
%%% Note that atomQ () -> /f, i.e () is not an atom.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
(\print (\equalQ (\list) ()))
(\print (\equalQ \lstA \lstB))
(\print (\equalQ \lstA \lstA))
(\print (\equalQ \lstB \lstB))
(\print (\equalQ :123 :123))
(\print (\equalQ :0 :-0))
(\print (\equalQ '$\alpha$' '$\alpha$'))
(\print (\equalQ 'A' 'a'))
```

/t/f/t/t/t/t/f

1.3 atomOrNilQ

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \atomOrNilQ \x
%%% Check whether \x is an atom or the empty list (). Returns /f otherwise.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
(\print (\atomQ () ))
(\print (\nilQ () ))
(\print (\atomOrNilQ () ))
(\print (\atomOrNilQ :1222))
(\print (\atomOrNilQ 'string'))
(\print (\atomOrNilQ \lstA))
```

/f/t/t/t/t/f

1.4 append

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \append \x \y
%%% Append \y to the list \x.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
(\define \lstAB (\append \lstA \lstB))
(\writeList \lstAB '(' ', ' ')')
(\texprint '\\') % newline
(\writeList (\append \lstA (\list 'the end of the list')) '[' ', ' ']')
```

(a, b, δ, 12, π, LaTeX, ($\frac{\xi}{\Omega}$, 999), $\partial\Gamma$)
[a, b, δ, 12, π, the end of the list]

1.5 subst

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \subst \x \y \z
%%% Substitute \x for \y in the list \z.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
(\writeList (\subst '\copyright' '\LaTeX' \lstAB ) '[' ', ' ']')
(\texprint '\\') % newline
```

```
(\writeList (\subst 'nine' :999 \lstAB ) '[' ', ' ']')
(\texprint '\\') % newline
(\writeList (\subst (\list :1 :2 'Z') :999 \lstAB ) '[' ', ' ']')
```

[a, b, δ, 12, π, ©, [$\frac{\xi}{\Omega}$, 999], $\partial\Gamma$]
[a, b, δ, 12, π, LaTeX, [$\frac{\xi}{\Omega}$, nine], $\partial\Gamma$]
[a, b, δ, 12, π, LaTeX, [$\frac{\xi}{\Omega}$, [1, 2, Z]], $\partial\Gamma$]

1.6 memberQ

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% \memberQ \x \y
%%% If \x is a member of \y then return /t else /f.
%%% Note: \x may be a sublist, and atoms are members only on first level!
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
(\print (\memberQ '\LaTeX' \lstAB))
(\print (\memberQ :999 \lstAB))
(\print (\memberQ '$\partial\Gamma$' \lstAB))
(\print (\memberQ (\list 'abc' :99)  (\list \lstA (\list 'abc' :99) \lstB))) % /t
(\print (\memberQ (\list '$\frac{\xi}{\Omega}$' :999) \lstAB))
```

/t/f/t/t/t