LISP - SYMBOLS

In LISP, a symbol is a name that represents data objects and interestingly it is also a data object.

What makes symbols special is that they have a component called the **property list**, or **plist.**

Property Lists

LISP allows you to assign properties to symbols. For example, let us have a 'person' object. We would like this 'person' object to have properties like name, sex, height, weight, address, profession etc. A property is like an attribute name.

A property list is implemented as a list with an even number *possiblyzero* of elements. Each pair of elements in the list constitutes an entry; the first item is the **indicator,** and the second is the **value.**

When a symbol is created, its property list is initially empty. Properties are created by using **get** within a **setf** form.

For example, the following statements allow us to assign properties title, author and publisher, and respective values, to an object named *symbol* 'book'.

Example 1

Create a new source code file named main.lisp and type the following code in it.

```
(write (setf (get 'books'title) '(Gone with the Wind)))
(terpri)
(write (setf (get 'books 'author) '(Margaret Michel)))
(terpri)
(write (setf (get 'books 'publisher) '(Warner Books)))
```

When you execute the code, it returns the following result:

```
(GONE WITH THE WIND)
(MARGARET MICHEL)
(WARNER BOOKS)
```

Various property list functions allow you to assign properties as well as retrieve, replace or remove the properties of a symbol.

The **get** function returns the property list of symbol for a given indicator. It has the following syntax:

```
get symbol indicator &optional default
```

The **get** function looks for the property list of the given symbol for the specified indicator, if found then it returns the corresponding value; otherwise default is returned *ornil, ifadefaultvalueisnotspecified*.

Example 2

Create a new source code file named main.lisp and type the following code in it.

```
(setf (get 'books 'title) '(Gone with the Wind))
(setf (get 'books 'author) '(Margaret Micheal))
(setf (get 'books 'publisher) '(Warner Books))

(write (get 'books 'title))
(terpri)
(write (get 'books 'author))
(terpri)
```

```
(write (get 'books 'publisher))
```

When you execute the code, it returns the following result:

```
(GONE WITH THE WIND)
(MARGARET MICHEAL)
(WARNER BOOKS)
```

The **symbol-plist** function allows you to see all the properties of a symbol.

Example 3

Create a new source code file named main.lisp and type the following code in it.

```
(setf (get 'annie 'age) 43)
(setf (get 'annie 'job) 'accountant)
(setf (get 'annie 'sex) 'female)
(setf (get 'annie 'children) 3)

(terpri)
(write (symbol-plist 'annie))
```

When you execute the code, it returns the following result:

```
(CHILDREN 3 SEX FEMALE JOB ACCOUNTANT AGE 43)
```

The **remprop** function removes the specified property from a symbol.

Example 4

Create a new source code file named main.lisp and type the following code in it.

```
(setf (get 'annie 'age) 43)
(setf (get 'annie 'job) 'accountant)
(setf (get 'annie 'sex) 'female)
(setf (get 'annie 'children) 3)

(terpri)
(write (symbol-plist 'annie))
(remprop 'annie 'age)
(terpri)
(write (symbol-plist 'annie))
```

When you execute the code, it returns the following result:

```
(CHILDREN 3 SEX FEMALE JOB ACCOUNTANT AGE 43)
(CHILDREN 3 SEX FEMALE JOB ACCOUNTANT)
```