Contents

1 Overview

This manual contains detailed information on all of the function, macro, variable, and constant definitions in this repository.

Version 1.0 was merged with the master branch on 31 December 2018.

Version 1.1 was merged with the master branch on 5 January 2019.

Version 1.2 was merged with the master branch on 6 January 2019.

Version 1.3 was merged with the master branch on 12 January 2019.

Version 1.4 was merged with the master branch on 2 February 2019.

Version 1.5 was merged with the master branch on 18 August 2019.

This is Version 1.5.13 of the Shu elisp repository.

What this document lacks lacks are detailed scenarios and work flows. The reader might well say that this is an interesting collection of parts, and then go on to ask how to use it. How does one use all of these things in a coherent manner?

I hope to address that in the near future.

One thing I will mention is that the function *shu-capture-all-latex* created the entire LaTex users manual (shu-manual.tex) and the function *shu-capture-all-md* created the entire markdown version of the users manual (shu-manual.md).

2 shu-base

Collection of miscellaneous functions and constants used by other packages in this repository. Most of the elisp files in this repository depend on this file.

2.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-add-to-alist` *added-item new-item alist testfn* [Macro]

Add an item to an alist. The car of *new-item* is a key to be added to the alist *alist*. If the key does not already exist in *alist*, *new-item* is added to *alist*. *added-item* is either the item that was added or the item that was previously there. If (eq *added-item* NEW-ITEM), then *new-item* was added to the list. If (not (eq *added-item* NEW-ITEM)), then the key already existed in the list and *added-item* is the item that was already on the list with a matching key. equal is the function used to determine equality unless *testfn* is supplied, in which case *testfn* is used.

This version of this macro is for emacs 26.1 and later. emacs 26.1 was released on May 28, 2018.

`shu-add-to-alist` *added-item new-item alist* [Macro]

Add an item to an alist. The car of *new-item* is a key to be added to the alist *alist*. If the key does not already exist in *alist*, *new-item* is added to *alist*. *added-item* is either the item that was added or the item that was previously there. If (eq *added-item* NEW-ITEM), then *new-item* was added to the list. If (not (eq *added-item* NEW-ITEM)), then the key already existed in the list and *added-item* is the item that was already on the list with a matching key. equal is the function used to determine equality.

This version of this macro is for versions of emacs older than 26.1, which was released on May 28, 2018

`shu-all-commits` [Constant]

A list of all commits by version starting with version 1.2

`shu-all-whitespace-chars` [Constant]

List of all whitespace characters. Since the syntax table considers newline to be (among other things) a comment terminator, the usual
s- won't work for whitespace that includes newlines.

`shu-all-whitespace-regexp` [Constant]

Regular expression to search for whitespace. Since the syntax table considers newline to be (among other things) a comment terminator, the usual
s- won't work for whitespace that includes newlines. Note that this regular expression is a character alternative enclosed in left and right brackets. skip-chars-forward does not expect character alternatives to be enclosed in square brackets and will include the left and right brackets in the class of characters to be skipped.

`shu-all-whitespace-regexp-scf` [Constant]

This is the regular expression contained in shu-all-whitespace-regexp but with the enclosing left and right square brackets removed. skip-chars-forward does not expect character alternatives to be enclosed in square brackets and thus will include the brackets as characters to be skipped.

`shu-comment-start-pattern` [Constant]

The regular expression that defines the delimiter used to start a comment.

`shu-cpp-author` [Custom]

The string to place in the doxygen author tag.

`shu-cpp-comment-end` [Custom]

Standard end point (right hand margin) for C style comments.

`shu-cpp-comment-start` [Custom]

Column in which a standard comment starts. Any comment that starts to the left of this point is assumed to be a block comment.

`shu-cpp-default-allocator-name` [Custom]

The name of the class member variable that holds the pointer to the allocator used by the class.

`shu-cpp-default-global-namespace` [Custom]
The string that defines the default global C++ namepace, if any. If this has a value, then C++ classes are declared with a two level namespace with the global namespace encompassing the local one

`shu-cpp-default-namespace` [Custom]
The string that defines the default C++ namepace, if any.

`shu-cpp-file-name` [Constant]
A regular expression to match the name of a C or C++ file in the file system.

`shu-cpp-include-user-brackets` [Custom]
Set non-nil if user written include files are to be delimited by angle brackets instead of quotes. In many C and C++ environments, system include files such as stdio.h are delimited by angle brackets, for example:

```
#include <stdio.h>
```

while user written include files are delimited by quotes, for example:

```
#include ``myclass.h''
```

If this variable is non-nil, then user written include files are delimited by angle brackets and an include of "myclass.h" would be written as

```
#include <myclass.h>
```

`shu-cpp-indent-length` [Custom]
Size of the standard indent for names within class declarations, etc.

`shu-cpp-name` [Constant]
A regular expression to match a variable name in a C or C++ program.

`shu-cpp-name-list` [Constant]
List of all characters that can be present in a C++ variable name.

`shu-cpp-std-namespace` [Custom]

The name of the namespace for the C++ standard library. Some users of the BDE open source Bloomberg libraries may prefer "bsl" instead.

`shu-cpp-use-bde-library` [Custom]
Set non-nil if the BDE library is to be used for generated C++ code.

`shu-current-line` [Function]
Return the line number of the current line relative to the start of the buffer.

`shu-date` [Constant]
Date of the most recent merge with the master branch.

`shu-end-of-string` *string-term* [Function]
Return the point that terminates the current quoted string in the buffer. The single argument *string-term* is a string containing the character that started the string (single or double quote). Return nil if the current string is not terminated in the buffer.

This function actually returns the position after the terminating quote and also moves point to that position. This cannot be changed because other functions depend on this frankly strange behavior.

`shu-fixed-format-num` *num width* [Function]
Return a printable representation of *num* in a string right justified and pad filled to length *width*. The number is formatted as comma separated as defined by shu-group-number.

`shu-format-num` *num width* **&optional** *pad-char* [Function]
Return a printable representation of *num* in a string right justified and pad filled to length *width*. The number is padded with blanks unless an optional *pad-char* is supplied, which is then used instead of blanks.

pad-char must be a character, not a string. If you want the string representation of the number to be right justified and zero filled, specify a pad character of ?0. Do not use a pad character of "0"

`shu-global-buffer-name` [Constant]
The name of the buffer into which shu-global-operation places its output.

`shu-goto-line` *line-number* [Function]

Move point to line *line-number*.

`shu-group-number` *num* **&optional** *size char* [Function]

Format *num* as string grouped to *size* with *char*. Default *size* if 3. Default *char* is ','. e.g., 1234567 is formatted as 1,234,567. Argument to be formatted may be either a string or a number.

`shu-invert-alist-list` *alist* **&optional** *compare-fn* [Function]

alist is an alist in which the car of each item is the key and the cdr of each item is a list of things associated with the key. This function inverts the alist. The car of each item in the new list is a member of one of the value lists in *alist*. The cdr of each item in the new list is a list of all of those keys that map to the value that is now the key in the new list.

If *compare-fn* is non-nil, then the lists in the car of each item in the new list are sorted using *compare-fn*.

As an example, the following input:

```
A -> (X Y Z)
B -> (Q X Z)
C -> (P X)
```

results in the following output being returned:

```
P -> (C)
Q -> (B)
X -> (A B C)
Y -> (A)
Z -> (A B)
```

`shu-kill-new` *string* [Function]

Effectively do a kill-new with *string* but use kill-ring-save from a temporary buffer. This seems to to a better job of putting *string* in a place from which other programs running on Linux and Windows can do a paste.

`shu-last-commit` [Constant]

The git SHA-1 of the most recent commit. This cannot be the SHA-1 hash of the last commit because that is not known until after the commit happens. Just before the merge with master, a commit is done. Its SHA-1 hash is copied into this constant. Then one more commit is done to push this change out. If you want to find this version in git, look for the commit after the one defined here.

`shu-line-and-column-at` *arg* [Function]

Return the line number and column number of the point passed in as an argument.

`shu-minimum-leading-space` *arg* **&optional** [Function]

Find the amount of white space in front of point and return either that count or *arg*, whichever is smaller. Used by functions that wish to safely delete *arg* characters of white space from the current position without deleting any characters that are not white space. An optional second argument is a string that defines what is meant by white space. The default definition is *shu-all-whitespace-regexp*.

`shu-non-cpp-name` [Constant]

A regular expression to match a character not valid in a variable name in a C or C++ program.

`shu-not-all-whitespace-regexp` [Constant]

Regular expression to search for non-whitespace. Since the syntax table considers newline to be (among other things) a comment terminator, the usual

s- won't work for whitespace that includes newlines. Note that this regular expression is a character alternative enclosed in left and right brackets. skip-chars-forward does not expect character alternatives to be enclosed in square brackets and will include the left and right brackets in the class of characters to be skipped.

`shu-point-at-sexp` *sos* [Command]

Return the point of the sexp that matches the point at *sos*.

`shu-point-in-string` **&optional** *pos* [Function]

Return the start position of the string text if point is sitting between a pair of non-escaped quotes (double quotes). The left-hand quote (opening quote) must be on the same line as point. The string must be on a single line. If point is sitting on a quote, then it is not inside a string. In order to be inside a string, point must lie between two non-escaped quotes. The optional argument *pos*, if specified, is used in place of the position of point.

`shu-remove-trailing-all-whitespace` *input-string* [Function]
Return a copy of *input-string* with all trailing whitespace removed. All control characters are considered whitespace.

`shu-the-column-at` *arg* [Function]
Return the column number of the point passed in as an argument.

`shu-the-line-at` *arg* [Function]
Return the line number of the point passed in as an argument. The line number is relative to the start of the buffer, whether or not narrowing is in effect.

`shu-trim` *string* [Function]
Trim leading and trailing whitespace from *string*. Return the modified string. String remains unmodified if it had no leading or trailing whitespace.

`shu-trim-file` [Custom]
If true, whitespace is trimmed from the end of lines and blank lines at the end of a file are deleted when a file is saved.

`shu-trim-file-hook` [Function]
Run as a before-save-hook to trim trailing whitespace from the end of lines and to trim blank lines from the end of a file if *shu-trim-file* is true.

`shu-trim-leading` *string* [Function]
Trim leading whitespace from *string*. Return the modified string. String remains unmodified if it had no leading whitespace.

`shu-trim-trailing` *string* [Function]

Trim trailing whitespace from *string*. Return the modified string. String remains unmodified if it had no trailing whitespace.

`shu-unit-test-buffer` [Constant]
The name of the buffer into which unit tests place their output and debug trace.

`shu-version` [Constant]
The version number of the Shu elisp package.

3 shu-bde-cpp

A collection of useful functions for generating C++ skeleton code files and classes for code written in Bloomberg, L.P. BDE style.

3.1 List of functions by alias name

A list of aliases and associated function names.

`gen-bb-component` *class-name* [Command]
(Function: shu-gen-bb-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

3.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-bb-cpp-set-alias` [Function]
Set the common alias names for the functions in shu-bb-cpp. These are generally the same as the function names with the leading shu- prefix removed.

`shu-gen-bb-component` *class-name* [Command]
(Alias: gen-bb-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

`shu-generate-bb-cfile` *author namespace class-name* [Function]
Generate a skeleton cpp file

`shu-generate-bb-hfile` *author namespace class-name* [Function]
Generate a skeleton header file

`shu-generate-bb-tfile` *author namespace class-name* [Command]
Generate a skeleton t.cpp file

4 shu-bde

A collection of useful functions for generating C++ skeleton code files and classes for code written in Bloomberg, L.P. BDE style.

4.1 List of functions by alias name

A list of aliases and associated function names.

`bde-add-guard` [Command]
(Function: shu-bde-add-guard)

Add the BDE include guards around an existing #include directive. If the line before the #include directive contains a valid guard, then we do not add a guard and position point to the line following the #include. This makes it possible to run bde-all-guard on a file that contains some guarded #includes and some unguarded #includes. Only the unguarded ones will have the guard added.

`bde-all-guard` [Command]
(Function: shu-bde-all-guard)

Add the BDE include guards around all of the #include directives in a file or narrowed region.

`bde-decl` *class-name* [Command]
(Function: shu-bde-decl)

Generate a skeleton BDE class declaration at point.

`bde-gen` *class-name* [Command]
(Function: shu-bde-gen)

Generate a skeleton BDE class code generation at point.

`bde-include` *fn* [Command]
(Function: shu-bde-include)

Insert at the current line, the BDE include guard sequence of #ifndef INCLUDED_GUARD #include <guard.h> #endif

`bde-sdecl` *class-name* [Command]
(Function: shu-bde-sdecl)

Generate a skeleton BDE struct definition at point.

`bde-sgen` *class-name* [Command]
(Function: shu-bde-sgen)
Generate a skeleton BDE struct code generation at point.

`gen-bde-component` *class-name* [Command]
(Function: shu-gen-bde-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

4.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-bde-add-guard` [Command]
(Alias: bde-add-guard)
Add the BDE include guards around an existing #include directive. If the line before the #include directive contains a valid guard, then we do not add a guard and position point to the line following the #include. This makes it possible to run bde-all-guard on a file that contains some guarded #includes and some unguarded #includes. Only the unguarded ones will have the guard added.

`shu-bde-all-guard` [Command]
(Alias: bde-all-guard)
Add the BDE include guards around all of the #include directives in a file or narrowed region.

`shu-bde-decl` *class-name* [Command]
(Alias: bde-decl)
Generate a skeleton BDE class declaration at point.

`shu-bde-gen` *class-name* [Command]
(Alias: bde-gen)
Generate a skeleton BDE class code generation at point.

`shu-bde-gen-cfile-copyright-hook` [Custom]
Generate the text that is the copyright notice placed in a code file, if any.

`shu-bde-gen-file-identifier-hook` [Custom]

Generate the text that constitutes a source file identifier, if any.

`shu-bde-gen-h-includes-hook` [Custom]
Generate the code for the standard includes in a header file.

`shu-bde-gen-hfile-copyright-hook` [Custom]
Generate the text that is the copyright notice placed in a header file, if any.

`shu-bde-gen-tfile-copyright-hook` [Custom]
Generate the text that is the copyright notice placed in a unit test file, if any.

`shu-bde-include` *fn* [Command]
(Alias: bde-include)
Insert at the current line, the BDE include guard sequence of #ifndef INCLUDED_GUARD #include <guard.h> #endif

`shu-bde-include-guard` **&optional** *fn* [Function]
Return the name of the macro variable to be used in a BDE style include guard. Name of the current buffer file name is used if no file name is passed in as the only optional argument. This is the name of the macro variable that is used in the include guard. If the name of the file is foo_something.h, then this function returns INCLUDED_FOO_SOMETHING. See also shu-bde-include-guard-fn

`shu-bde-include-guard-fn` **&optional** *fn* [Function]
Return the file name name of the macro variable to be used in a BDE style include guard. Name of the current buffer file name is used if no file name is passed in as the only optional argument. This is only the file name part of the include guard. If the name of the file is foo_something.h, then this function returns FOO_SOMETHING. The full name of the macro variable would be INCLUDED_FOO_SOMETHING. See also shu-bde-include-guard

`shu-bde-insert-guard` *fn at-top* [Function]
Insert a #ifndef / #endif guard around an #include directive. *fn* is the name of the included file. *at-top* is true if the #include directive is located on the first line of the file so there is no line above it.

`shu-bde-sdecl` *class-name* [Command]
(Alias: bde-sdecl)
Generate a skeleton BDE struct definition at point.

`shu-bde-set-alias` [Function]
Set the common alias names for the functions in shu-bde. These are generally the same as the function names with the leading shu- prefix removed.

`shu-bde-sgen` *class-name* [Command]
(Alias: bde-sgen)
Generate a skeleton BDE struct code generation at point.

`shu-gen-bde-component` *class-name* [Command]
(Alias: gen-bde-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

`shu-generate-bde-cfile` *author namespace class-name* [Function]
Generate a skeleton cpp file

`shu-generate-bde-hfile` *author namespace class-name* [Function]
Generate a skeleton header file

`shu-generate-bde-tfile` *author namespace class-name* [Command]
Generate a skeleton t.cpp file

`shu-generate-git-add` *filename gitbuf* [Function]
Do a "git add" of *filename* and show the result of the operation in the buffer *gitbuf*.

5 shu-capture-doc

Collection of functions used to capture function and variable definitions along with their associated doc strings in elisp code. It can then write this information into a buffer in either markdown or LaTex format for subsequent publication.

This mechanism was used to create most of the documentation for the elisp functions in this repository.

5.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-capture-a-type-after` [Constant]
: The a-list key value that identifies the string that is placed after a verbatim code snippet.

`shu-capture-a-type-arg` [Constant]
: The a-list key value that identifies the function that converts an argument name to markup.

`shu-capture-a-type-before` [Constant]
: The a-list key value that identifies the string that is placed before a verbatim code snippet.

`shu-capture-a-type-buf` [Constant]
: The a-list key value that identifies the function that converts a buffer name or other name that begins and ends with asterisks to markup.

`shu-capture-a-type-close-quote` [Constant]
: The a-list key value that identifies the string that is a close quote.

`shu-capture-a-type-doc-string` [Constant]
: The a-list key value that identifies the function that converts a key word, such as “&optional” or “&rest” to markup.

`shu-capture-a-type-enclose-doc` [Constant]
: The a-list key value that identifies the function that converts a key word, such as “&optional” or “&rest” to markup.

`shu-capture-a-type-func` [Constant]
The a-list key value that identifies the function that formats a function signature'

`shu-capture-a-type-hdr` [Constant]
The a-list key value that identifies the function that emits section headers

`shu-capture-a-type-keywd` [Constant]
The a-list key value that identifies the function that converts a key word, such as "&optional" or "&rest" to markup.

`shu-capture-a-type-open-quote` [Constant]
The a-list key value that identifies the string that is an open quote.

`shu-capture-alias-list` [Variable]
The alist that holds all of the alias names.

`shu-capture-aliases` [Function]
Undocumented

`shu-capture-all-latex` [Command]
Visit all of the files in *shu-capture-file-list*, invoking *shu-capture-latex* on each file to capture its documentation and turn it into LaTex source.

`shu-capture-all-md` [Command]
Visit all of the files in *shu-capture-file-list*, invoking *shu-capture-md* on each file to capture its documentation and turn it into markdown source.

`shu-capture-arg-to-latex` *arg-name* [Function]
Convert a function argument in a doc-string or argument list to LaTex.

`shu-capture-arg-to-md` *arg-name* [Function]
Convert a function argument in a doc-string or argument list to markdown.

`shu-capture-attr-alias` [Constant]
Bit that indicates that a function is identified by its alias name

`shu-capture-attr-const` [Constant]
Bit that indicates that a definition is a defconst

`shu-capture-attr-custom` [Variable]
Bit that indicates that a definition is a defcustom

`shu-capture-attr-inter` [Constant]
Bit that indicates that a function is interactive

`shu-capture-attr-macro` [Constant]
Bit that indicates that a function is a macro

`shu-capture-attr-var` [Variable]
Bit that indicates that a definition is a defvar

`shu-capture-buf-to-latex` *buf-name* [Function]
Convert a buffer name or other name that starts and ends with asterisks in a doc-string to markdown.

`shu-capture-buf-to-md` *buf-name* [Function]
Convert a buffer name or other name that starts and ends with asterisks in a doc-string to markdown.

`shu-capture-buffer-name` [Constant]
Name of the buffer into which the converted documentation is written

`shu-capture-code-in-doc` *before-code after-code section-converter* [Function]
The current buffer is assumed to hold a doc string that is being converted to either markdown or LaTex. We divide the text into two categories. The first category is plain text that should be scanned for characters to escape, such as pound signs if we are converting to LaTex. The second category is text that should not be scanned for characters to escape, either because it is to be treated as a verbatim code snippet or because it is a pseudo markdown section heading that will be converted either to a markdown section heading or to a LaTex section heading.

When we come to the end of plain text (either because we have found a code snippet or because we have found a pseudo markdown section heading), we call the *text-converter* function on the bounds of the plain

text whose end we have just found.

A pseudo markdown section heading is identified as follows. It must start in column 1. It must start with two to four pound signs. It must have some text. It must end at the end of the line with the same number of pound signs with which it started.

A code snippet to be shown in verbatim mode is any one whose first column occurs on or after *shu-capture-doc-code-indent*.

When the *text-converter* function is called. It may expand the size of the text area if it adds characters to the text. It is the responsibility of the *text-converter* function to return the new text end point to this function.

`shu-capture-code-in-md` [Function]

The current buffer is assumed to hold a doc string that is being converted to markdown. Any line that is indented to column *shu-capture-doc-code-indent* or greater is assumed to be a code snippet and will be surrounded by "“" to make it a code snippet in markdown. Return the number of code snippets marked.

`shu-capture-commentary` [Function]

Search through an elisp file for a package name and a commentary section. Return a cons cell whose car is the package name and whose cdr is the prose found in the commentary section.

`shu-capture-convert-args-to-markup` *signature* [Function]
keywd-converter

signature contains the function signature (both function name and arguments). *arg-converter* is the function used to convert an argument to markup. *keywd-converter* is the function used to convert an argument list keyword, such as "&optional" or "&rest" to markup.

This function returns a cons cell pointing to two lists. The first list contains the length of each argument name prior to conversion to markup. This is because the amount of space on a line is largely determined by the length of the unconverted argument. "arg" will take much less space on a line than will the same word with markup added. The second list contains each of the argument names converted to the appropriate markup.

Given the following function signature:

```
do-something (with these things \&optional and \&rest others)
```

the length list will contain (4, 5, 6, 9, 3, 5, 6). The converted arguments list for markdown will contain ("{*with*}", "{*these*}", "{*things*}", "{**}&optional{**}", "{*and*}", "{**}&rest{**}", "{*others*}").

If the function signature contains no arguments, then nil is returned instead of the above described cons cell.

`shu-capture-convert-doc-string` *signature converters* [Function]

description contains a doc string from a function definition (with leading and trailing quotes removed). *converters* is an a-list of functions and strings as follows:

Key	Value
shu-capture-a-type-hdr	Function to format a section header
shu-capture-a-type-func	Function to format a function signature
shu-capture-a-type-buf	Function to format a buffer name
shu-capture-a-type-arg	Function to format an argument name
shu-capture-a-type-keywd	Function to format a key word
shu-capture-a-type-doc-string	Function to finish formatting the doc string
shu-capture-a-type-enclose-doc	Function to enclose doc string in begin / end
shu-capture-a-type-before	String that starts a block of verbatim code
shu-capture-a-type-after	String that ends a block of verbatim code
shu-capture-a-type-open-quote	String that is an open quote
shu-capture-a-type-close-quote	String that is a close quote

This function turns escaped quotes into open and close quote strings, turns names with leading and trailing asterisks (e.g., {**project-buffer**}) into formatted buffer names, turns upper case names that match any argument names into lower case, formatted argument names. This is an internal function of shu-capture-doc and will likely crash if called with an invalid a-list.

`shu-capture-convert-func-latex` *func-def converters* [Function]

Take a function definition and turn it into a string of LaTex. Return said string.

`shu-capture-convert-func-md` *func-def converters* [Function]

Take a function definition and turn it into a string of markdown. Return said string.

`shu-capture-convert-quotes` *open-quote close-quote* [Function]
Go through the current buffer converting any escaped quote to either an open or close quote. If an escaped quote is preceded by whitespace, "(", "{", "<", or ">", or by a close quote, then we replace it with an open quote. Otherwise we replace it with a close quote.

`shu-capture-doc` *converters* [Function]
Top level function that captures all definitions and doc strings in a language neutral manner and then uses the supplied *converters* to convert the documentation to either markdown or LaTex.

`shu-capture-doc-code-indent` [Constant]
Any line indented by this much in a doc string is assumed to be a sample code snippet.

`shu-capture-doc-convert-args` *signature converters* [Function]
The current buffer contains a doc string from a function. The argument to this function is the *signature* of the function for which the doc string was written. This function goes through the doc string buffer looking for any word that is all upper case. If the upper case word matches the name of an argument to the function, it is passed to the CONVERTER function for conversion into a markup language, which is probably markdown or LaTex, and it is then replaced in the doc string buffer.

For example, if the function has the following signature:

```
do-something (hat cat)
```

with the following doc string:

"The Linux HAT is converted to an IBM CAT."

would be converted to:

"The Linux {*hat*} is converted to an IBM {*cat*.}"

`shu-capture-doc-convert-args-to-latex` *signature* [Function]
Undocumented

`shu-capture-doc-convert-args-to-md` *signature* [Function]
Undocumented

`shu-capture-enclose-doc-latex` [Function]
Enclose the doc-string with the appropriate begin / end pair for LaTex.

`shu-capture-enclose-doc-md` [Function]
Enclose the doc-string with the appropriate begin / end pair for markdown.

`shu-capture-file-list` [Constant]
This is a list of all of the files in this repository from which documentation should be extracted.

`shu-capture-finish-doc-string-latex` [Command]
Function that executes last step in the conversion of a doc-string to markdown.

`shu-capture-finish-doc-string-md` [Function]
Function that executes last step in the conversion of a doc-string to markdown.

`shu-capture-func-type-name` *attributes* [Command]
Return the name of the type "Alias," "Macro," "Constant," "Variable," or "Function" based on the *attributes* passed in.

`shu-capture-get-args-as-alist` *signature* [Function]
signature contains the function signature (both function name and arguments). This function returns the arguments as an a-list in which all of the argument names are the keys. The special argument names "&optional" and "&rest", if present, are not copied into the a-list.

For example, if *signature* holds the following:

```
do-something (with these things \&optional and \&rest others)
```

an a-list is returned with the keys "others," "and," "things," "these," and "with."

`shu-capture-get-doc-string` *eof* [Command]

Enter with point positioned immediately after a function declaration. Try to fetch the associated doc string as follows: 1. Look for the first open or close parenthesis. 2. Look for the first quote. If the first parenthesis comes before the first quote, then there is no doc string. In the following function, there is no doc string:

```
(defun foo (name)
  (interactive ``sName?: ``))
```

but if we do not notice that the first parenthesis comes before the first quote, then we might think that there is a doc string that contains "sName?: ".

Return the doc string if there is one, nil otherwise.

`shu-capture-get-func-def` *func-def signature description alias* [Macro]

Extract the information from the func-def

`shu-capture-get-func-def-alias` *func-def alias* [Macro]

Extract the function alias from the func-def

`shu-capture-get-func-def-sig` *func-def signature* [Macro]

Extract the function signature from the func-def

`shu-capture-get-name-and-args` *signature func-name* [Macro]

Extract the function and the string of arguments from a whole signature that includes both the function name and the arguments. If *signature* contains:

```
``do-something (to something)''
```

The on return *func-name* will hold "do-something" and *args* will contain the string "to something)". If there are no arguments, *args* will contain a string

of length zero. If there is no function name, *func-name* will contain a string of length zero

`shu-capture-headers-in-doc` *section-converter* [Function]
Convert markdown section headers to either markdown or LaTex. This allows the author of some Commentary at the beginning of a file to add section headers. If the heading level is 2 through 4 and the heading begins in column 1 and the number of pound signs at the end is the same as the number of pound signs at the beginning and the pound signs at the end are at the end of a line, then this is considered to be a heading and is translated to either markdown or LaTex.

`shu-capture-index-buffer` [Constant]
Name of the buffer into which the markdown index is written

`shu-capture-internal-all` *file-list capture-func* [Function]
Visit all of the files in *file-list*, invoking *capture-func* on each file to capture its documentation and turn it into either LaTex or markdown.

`shu-capture-internal-convert-doc-string` *signature* [Function]
converters
description contains a doc string from a function definition (with leading and trailing quotes removed). *converters* is an a-list of functions and strings as follows:

Key	Value
shu-capture-a-type-hdr	Function to format a section header
shu-capture-a-type-func	Function to format a function signature
shu-capture-a-type-buf	Function to format a buffer name
shu-capture-a-type-arg	Function to format an argument name
shu-capture-a-type-keywd	Function to format a key word
shu-capture-a-type-doc-string	Function to finish formatting the doc string
shu-capture-a-type-enclose-doc	Function to enclose doc string in begin / end
shu-capture-a-type-before	String that starts a block of verbatim code
shu-capture-a-type-after	String that ends a block of verbatim code
shu-capture-a-type-open-quote	String that is an open quote
shu-capture-a-type-close-quote	String that is a close quote

This function turns escaped quotes into open and close quote strings, turns

names with leading and trailing asterisks (e.g., {**project-buffer**}) into formatted buffer names, turns upper case names that match any argument names into lower case, formatted argument names. This is an internal function of shu-capture-doc and will likely crash if called with an invalid a-list.

`shu-capture-internal-doc` [Command]
Function that captures documentation for all instances of "defun," "defsubst," and "defmacro."

`shu-capture-keywd-optional` [Constant]
The argument list keyword for an optional argument.

`shu-capture-keywd-rest` [Constant]
The argument list keyword for a multiple optional arguments.

`shu-capture-keywd-to-latex` *keywd-name* [Function]
Convert a function argument key word in a doc-string or argument list to LaTex.

`shu-capture-keywd-to-md` *arg-name* [Function]
Convert a function argument key word in a doc-string or argument list to markdown.

`shu-capture-latex` [Command]
Capture all of the function and macro definitions in a .el source file and turn them into a LaTex text that documents the functions and their doc strings.

`shu-capture-latex-arg-end` [Constant]
Define the latex string that is used to terminate an argument name.

`shu-capture-latex-arg-start` [Constant]
Define the latex string that is used to prepended to an argument name.

`shu-capture-latex-buf-end` [Constant]
Define the LaTex string that is used at the end of a buffer name or any other name that has leading and trailing asterisks

`shu-capture-latex-buf-start` [Constant]
Define the LaTex string that is used in front of a buffer name or any

other name that has leading and trailing asterisks

`shu-capture-latex-close-quote` [Constant]
Define the LaTex string that is a close quote.

`shu-capture-latex-code-end` [Constant]
Define the LaTex string that is at the end of a verbatim code snippet.

`shu-capture-latex-code-start` [Constant]
Define the LaTex string that is at the beginning of a verbatim code snippet.

`shu-capture-latex-converters` [Constant]
This is the association list of functions and strings that is used to take an elisp function and its associated doc string and convert it to LaTex.

`shu-capture-latex-doc-end` [Constant]
Define the LaTex string that ends a doc string.

`shu-capture-latex-doc-start` [Constant]
Define the LaTex string that starts a doc string.

`shu-capture-latex-keywd-end` [Constant]
Define the latex string that is used to terminate an argument name.

`shu-capture-latex-keywd-start` [Constant]
Define the latex string that is used to prepended to an argument name.

`shu-capture-latex-open-quote` [Constant]
Define the LaTex string that is an open quote.

`shu-capture-latex-section-end` [Constant]
Define the LaTex tag that is used to identify the start of a section heading.

`shu-capture-latex-section-start` [Constant]
Define the LaTex tag that is used to identify the start of a section heading.

`shu-capture-make-args-latex` *func-name markups* [Function]

func-name is the name of the function, macro, alias, etc. *func-type* is a string that represents the function type. This will be part of the argument display. *markups* is either nil or is a cons cell that points to two lists. If *markups* is nil, the function has no arguments. If *markups* is non-nil, it is a cons cell that points to two lists. The car of *markups* is a list of the lengths of each argument before any markup was added to the argument. If an argument name is "arg1," its length is 4 even though the length of the argument name after markup is applied may be longer. The cdr of *markups* is a list of the arguments with markup applied to them.

`shu-capture-make-args-md` *func-name markups section-converter* [Function]

func-name is the name of the function, macro, alias, etc. *func-type* is a string that represents the function type. This will be part of the argument display. *markups* is either nil or is a cons cell that points to two lists. If *markups* is nil, the function has no arguments. If *markups* is non-nil, it is a cons cell that points to two lists. The car of *markups* is a list of the lengths of each argument before any markup was added to the argument. If an argument name is "arg1," its length is 4 even though the length of the argument name after markup is applied may be longer. The cdr of *markups* is a list of the arguments with markup applied to them. *section-converter* is the function that will turn a string into a section heading.

`shu-capture-make-latex-section` *level hdr* [Function]

Turn *hdr* into a LaTex section header of level *level*, where 1 is a section, 2 a subsection, etc. Return the LaTex string.

`shu-capture-make-md-section` *level hdr* [Function]

Turn *hdr* into a markdown section header of level *level*, where 1 is a section, 2 a subsection, etc. Return the markdown string. If level is one (major heading), write a corresponding entry into the markdown table of contents buffer.

`shu-capture-md` [Command]

Capture all of the function and macro definitions in a .el source file and

turn them into markdown text that documents the functions and their doc strings.

`shu-capture-md-arg-delimiter` [Constant]
Define the markdown delimiter that is used to surround an argument name.

`shu-capture-md-buf-delimiter` [Constant]
Define the markdown delimiter that is used to surround a buffer name or any other name that has leading and trailing asterisks

`shu-capture-md-code-delimiter` [Constant]
Define the markdown delimiter that is used to surround a code snippet.

`shu-capture-md-converters` [Constant]
This is the association list of functions and strings that is used to take an elisp function and its associated doc string and convert it to markdown.

`shu-capture-md-keywd-delimiter` [Constant]
Define the markdown delimiter that is used to surround an key word such as "&optional" or "&rest".

`shu-capture-md-quote-delimiter` [Constant]
Define the markdown delimiter that is used for open and close quote.

`shu-capture-md-section-delimiter` [Constant]
Define the markdown delimiter that is used to identify a section. This is separated from the section name by a space.

`shu-capture-pre-code-in-doc` [Constant]
The a-list key value that identifies the function that converts characters in a doc string right before the code snippets are captured.

`shu-capture-pre-code-latex` *min-point max-point* [Function]
Function that prepares a doc string to capture code snippets in LaTex. Enter with *min-point* and *max-point* defining the region to be changed. *min-point* cannot change because all changes are made after it. But *max-point* will change if replacements add extra characters. Return the new value of *max-point* which takes into account the number of

characters added to the text.

`shu-capture-pre-code-md` *min-point max-point* [Function]
Function that prepares a doc string to capture code snippets in markdown.

`shu-capture-set-func-def` *func-def signature description* [Macro]
Create a func-def to describe the function

`shu-capture-set-func-def-alias` *func-def signature description alias* [Macro]
Create a func-def to describe the function

`shu-capture-show-list` *func-list converters buffer* [Function]

func-list is a list of function and macro definitions. *converters* is an a-list of functions and strings as follows:

Key	Value
shu-capture-a-type-hdr	Function to format a section header
shu-capture-a-type-func	Function to format a function signature
shu-capture-a-type-buf	Function to format a buffer name
shu-capture-a-type-arg	Function to format an argument name
shu-capture-a-type-keywd	Function to format a key word
shu-capture-a-type-doc-string	Function to finish formatting the doc string
shu-capture-a-type-enclose-doc	Function to enclose doc string in begin / end
shu-capture-a-type-before	String that starts a block of verbatim code
shu-capture-a-type-after	String that ends a block of verbatim code
shu-capture-a-type-open-quote	String that is an open quote
shu-capture-a-type-close-quote	String that is a close quote

This function goes through the list and uses the *converters* to turn the set of function definitions into either markdown or LaTex.

`shu-capture-show-list-md` *func-list buffer* [Function]
Show a list

`shu-capture-toc-buffer` [Constant]

Name of the buffer into which the markdown table of contents is written

`shu-capture-vars` *func-list* [Function]
Find the name and doc-string for instances of "defvar" or "defconst."

`shu-doc-internal-func-to-md` *func-def* [Function]
Take a function definition and turn it into a string of markdown text.

`shu-doc-internal-to-md` *description* [Function]
description contains a doc string from a function definition (with leading and trailing quotes removed). This function turns escaped quotes into regular (non-escaped) quotes and turns names with leading and trailing asterisks (e.g., {**project-count-buffer**}) into short code blocks surrounded by back ticks. It also turns upper case names into lower case names surrounded by markdown ticks.

`shu-doc-sort-compare` *lhs rhs* [Function]
Compare two function names in a sort.

6 shu-cpp-general

A collection of useful functions for dealing with C++ code.

6.1 Selected highlights

Here are some useful features of this package.

6.1.1 Dealing with long string constants

If you copy strings of text into string constants in your program, you may end up with some very long lines. *shu-csplit* can automatically split such a line for you. *shu-cunsplit* can undo the split. *shu-creplace* can in one operation, replace a split line with a different string constant.

6.2 List of functions by alias name

A list of aliases and associated function names.

`author` [Command]
(Function: shu-author)
Insert the doxygen author tag in an existing file.

`binclude` [Command]
(Function: shu-binclude)
If point is sitting on something that resembles a fully qualified class name, use the standard BDE algorithm to turn the class name into the name of an include file. The standard BDE algorithm replaces the :: between namespace and class name with an underscore, makes all letters lower case, and appends ".h" to the end of the name.

Thus "abcdef::MumbleFrotz" becomes "abcdef_mumblefrotz.h".

An include directive for the file is then created and put into the kill ring for a subsequent yank.

The file name is delimited by double quotes unless *shu-cpp-include-user-brackets* variable is true, in which case the file name is delimited by left and right angle brackets.

Return true if a class name was found an an include generated. This is for the benefit of unit tests.

`cdo` [Command]
(Function: shu-cdo)
Insert an empty do statement.

`celse` [Command]
(Function: shu-celse)
Insert an empty else statement.

`cfor` [Command]
(Function: shu-cfor)
Insert an empty for statement.

`cif` [Command]
(Function: shu-cif)
Insert an empty if statement.

`ck` *start end* [Command]
(Function: shu-cpp-check-streaming-op)
Check a streaming operation. Mark a region that contains a set of streaming operators and invoke this function. It will make sure that you have no unterminated strings and that you are not missing any occurrences of <<.

`clc` [Command]
(Function: shu-clc)
Place a skeleton Doxygen header definition at point.

`cpp1-class` *class-name* [Command]
(Function: shu-cpp1-class)
Place a skeleton class definition in the current buffer at point.

`cpp2-class` *class-name* [Command]
(Function: shu-cpp2-class)
Place a skeleton class definition in the current buffer at point.

`creplace` [Command]

(Function: shu-creplace)

This function will replace the C++ string in which point is placed with the C++ string in the kill ring. The C++ string in the kill ring is expected to be a single string with or without quotes. The C++ string in which point is placed may have been split into smaller substrings in order to avoid long lines.

Assume you have the sample string that is shown in *shu-csplit*

```
static const std::string x(‘‘This is a very long line of text that look’’
                           ‘‘s as though it will go on forever.’’);
```

You wish to replace it with a slightly different line of text, perhaps something that came from the output of a program. Copy the new string into the kill ring. Then put the cursor into any part of any line of the string to be replaced and invoke this function. This function will remove the old string, replace it with the contents of the string in the kill ring, and then split it up into shorter lines as in the following example. The string in the kill ring may have opening and closing quotes or not.

```
static const std::string x(‘‘This is a very long line of text that look’’
                           ‘‘s as though it will go on forever and prob’’
                           ‘‘ably already has done so or is threatening’’
                           ‘‘ to do so.’’);
```

This is especially useful if you have a a string constant in a unit test and you have modified the code that creates the string. gtest will complain that the expected string did not match the actual string. If the actual string is correct, copy it into the kill ring, go into your unit test, find the old string, place the cursor in the old string, and replace it with the new.

`csplit` [Command]

(Function: shu-csplit)

Split a C++ string into multiple strings in order to keep the line length below a certain minimum length, currently hard coded to column 76.

For example, you may copy a very long line of text into a section of code as follows:

```
static const std::string x(‘‘This is a very long line of text that looks as though
```

To be polite to future code readers, you want to split this into multiple lines. This can be a bit cumbersome if the text is very long. This function splits the text at a somewhat arbitrary boundary so that it can be read by others whose text editors do not show code much beyond column 80 or so. This is an example of the above line after csplit was invoked:

```
static const std::string x(``This is a very long line of text that look''
                           ``s as though it will go on forever.'');
```

`cunsplit` [Command]
(Function: shu-cunsplit)

The beginnings of a re-write of *shu-cunsplit*. Needs more testing. Undo the split that was done by csplit. Place the cursor anywhere in any of the strings and invoke this function.

`cwhile` [Command]
(Function: shu-cwhile)

Insert an empty while statement.

`dbx-malloc` [Command]
(Function: shu-dbx-summarize-malloc)

Go through the output of a dbx malloc dump and generate a summary. dbx is the AIX debugger. It has a malloc command that goes through the heap and prints one line for every allocated buffer. Here is a sample of some of its output:

```
    ADDRESS         SIZE HEAP    ALLOCATOR
 0x30635678          680    0     YORKTOWN
 0x30635928          680    0     YORKTOWN
 0x30635bd8          680    0     YORKTOWN
```

YORKTOWN is the name of the default allocator on AIX. This function goes through the malloc output and gets the number and sizes of all buffers allocated. This tells you how many buffers were allocated, the total number of bytes allocated, and the total number of buffers allocated by size. The output is placed in a separate buffer called {**shu-aix-malloc**.}

`dcc` [Command]
(Function: shu-dcc)

Place a skeleton Doxygen header definition at point.

`dce` [Command]
(Function: shu-dce)

Place a skeleton Doxygen header definition at point.

`dciterate` *type-name var-name-1 var-name-2* [Command]
(Function: shu-dciterate)

Insert the code to iterate through a pair of data structures of type *type-name*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first prompt reads the type name, second and third prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name::const_iterator,
               type-name::const_iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`diterate` *type-name var-name-1 var-name-2* [Command]
(Function: shu-diterate)

Insert the code to iterate through a pair of data structures of type *type-name*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first prompt reads the type name, second and third prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name::iterator,
               type-name::iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`dox-brief` [Command]
(Function: shu-dox-brief)
Place a skeleton Doxygen header definition at point.

`dox-cbt` [Command]
(Function: shu-dox-cbt)
Convert a section of comments delimited by //! into Doxygen brief format.

`dox-cvt` [Command]
(Function: shu-dox-cvt)
Convert a section of comments delimited by // into Doxygen format.

`dox2-hdr` [Command]
(Function: shu-dox2-hdr)
Place a skeleton Doxygen header definition at point.

`drc` [Command]
(Function: shu-drc)
Place a skeleton Doxygen header definition at point.

`fixp` [Command]
(Function: shu-cpp-fix-prototype)
Place the cursor on the beginning of a function declaration that has been copied from a .cpp file to a .h file. This function fixes up the function prototype to make it suitable for a .h file. For example, this

declaration:

```
double Frobnitz::hitRatio(
    const int  reads,
    const int  writes)
const
```

would be transformed into

```
double hitRatio(
    const int  reads,
    const int  writes)
const;
```

`get-set` [Command]
(Function: shu-get-set)
Generate get and set functions for an instance variable in a C++ class. Position the cursor ahead of the Doxygen comment above the variable. The get and set functions will be placed in the buffer {*get-set*.}

`getdef` [Command]
(Function: shu-cpp-find-h-definition)
While in a cpp file, position point on a variable name that is defined in the corresponding header file and invoke this function. It will find all occurrences of the name in the header file and put them in the message area.

`getters` *start end* [Command]
(Function: shu-getters)
Mark a region in a file that contains C++ instance variable declarations. This function will create get and set functions for all of the instance variables.

`ginclude` [Command]
(Function: shu-ginclude)
While in a file buffer, wrap the file name in a C++ include directive and put it in the kill ring. The file name is delimited by double quotes

unless *shu-cpp-include-user-brackets* variable is true, in which case the file name is delimited by left and right angle brackets.

`new-c-class` [Command]
(Function: shu-new-c-class)
Place a skeleton class definition in the current buffer at point.

`new-c-file` [Command]
(Function: shu-new-c-file)
Generate a skeleton code file for a C or C++ file.

`new-h-file` [Command]
(Function: shu-new-h-file)
Generate a skeleton header file for C or C++ file.

`new-x-file` [Command]
(Function: shu-new-x-file)
Generate a skeleton Doxygen
file directive.

`operators` *class-name* [Command]
(Function: shu-operators)
Place skeletons of all of the standard c++ operator functions at point.

`qualify-bsl` [Command]
(Function: shu-qualify-namespace-bsl)
Add "bsl" namespace qualifier to some of the classes in "bsl". Return the count of class names changed.

`qualify-class` [Command]
(Function: shu-interactive-qualify-class-name)
Interactively call *shu-qualify-class-name* to find all instances of a class name and add a namespace qualifier to it. First prompt is for the class name. If a fully qualified class name is supplied, then the given namespace is applied to the class name. If the name supplied is not a namespace qualified class name, then a second prompt is given to read the namespace. This is intended to help rescue code that has one or more "using namespace" directives in it. The problem with "using namespace" is that you now have class names from other namespaces

with no easy way to identify the namespace to which they belong. The best thing to do is get rid of the "using namespace" statements and explicitly qualify the class names. But if you use a simple replace to do that, you will qualify variable names that resemble class names as well as class names that are already qualified. This function only adds a namespace to a class name that does not already have a namespace qualifier.

`qualify-std` [Command]
(Function: shu-qualify-namespace-std)

Add "std" namespace qualifier to some of the classes in "std". Return the count of class names changed.

`set-default-namespace` *name* [Command]
(Function: shu-set-default-namespace)

Set the local namespace for C++ classes.

`tciterate` *type-name-1 type-name-2 var-name-1* [Command]
(Function: shu-tciterate)

Insert the code to iterate through a pair of data structures of types *type-name-1* and *type-name-2*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first two prompt reads the two type names, third and fourth prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name-1::const_iterator,
               type-name-2::const_iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`titerate` *type-name-1 type-name-2 var-name-1* [Command]
(Function: shu-titerate)

Insert the code to iterate through a pair of data structures of types *type-name-1* and *type-name-2*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first two prompt reads the two type names, third and fourth prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name-1::iterator,
               type-name-2::iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`to-snake` [Command]
(Function: shu-to-snake)

Convert the variable name at point from camel case to snake case.

For example, "mumbleSomethingOther" becomes "mumble_something_other".

6.3 List of functions and variables

List of functions and variable definitions in this package.

`shu-add-cpp-base-types` *ntypes* [Function]

Add one or more data types to the list of C++ native data types defined in shu-cpp-base-types in shu-cpp-general.el. Argument may be a single type in a string or a list of strings. This modifies shu-cpp-base-types.

`shu-aix-show-malloc-list` *mlist gb* [Function]

Print the number of buffers allocated by size from an AIX dbx malloc command.

`shu-attr-name` [Variable]

The name of an attribute.

`shu-author` [Command]

(Alias: author)

Insert the doxygen author tag in an existing file.

`shu-binclude` [Command]

(Alias: binclude)

If point is sitting on something that resembles a fully qualified class name, use the standard BDE algorithm to turn the class name into the name of an include file. The standard BDE algorithm replaces the :: between namespace and class name with an underscore, makes all letters lower case, and appends ".h" to the end of the name.

Thus "abcdef::MumbleFrotz" becomes "abcdef_mumblefrotz.h".

An include directive for the file is then created and put into the kill ring for a subsequent yank.

The file name is delimited by double quotes unless *shu-cpp-include-user-brackets* variable is true, in which case the file name is delimited by left and right angle brackets.

Return true if a class name was found an an include generated. This is for the benefit of unit tests.

`shu-cciterate` *type-name var-name* [Command]

Insert the code to iterate through a data structure of type *type-name* whose instance is identified by *var-name*. First prompt reads the type name. Second prompt read the variable name.

The generated code sequence is as follows:

```
for (type_name::const_iterator it = var_name.begin();
     it != var_name.end(); ++it)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

`shu-cdo` [Command]
(Alias: cdo)
Insert an empty do statement.

`shu-celse` [Command]
(Alias: celse)
Insert an empty else statement.

`shu-cfor` [Command]
(Alias: cfor)
Insert an empty for statement.

`shu-cif` [Command]
(Alias: cif)
Insert an empty if statement.

`shu-citerate` *type-name var-name* [Command]
Insert the code to iterate through a data structure of type *type-name* whose instance is identified by *var-name*. First prompt reads the type name. Second prompt read the variable name.

The generated code sequence is as follows:

```
for (type_name::iterator it = var_name.begin();
     it != var_name.end(); ++it)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

`shu-class-is-blocked` *pos* **&optional** *in-string* [Function]

Return true if a class name should be ignored because it is either in a string or a comment.

We have found something at point *pos* that looks as though it might be a class name. If it is in a string or is preceded on the same line by

"//" (also not in a string), then it is either in a string or is probably in a comment, so we may want to ignore it. *in-string* is true if a class name inside of a string is to be replaced. *in-comment* is true if a class name inside of a comment is to be replaced.

Return true if the class name should be ignored.

`shu-clc` [Command]
(Alias: clc)

Place a skeleton Doxygen header definition at point.

`shu-cpp-base-types` [Constant]

A list of all of the base types in C and C++. This may be modified by shu-add-cpp-base-types

`shu-cpp-check-streaming-op` *start end* [Command]
(Alias: ck)

Check a streaming operation. Mark a region that contains a set of streaming operators and invoke this function. It will make sure that you have no unterminated strings and that you are not missing any occurrences of <<.

`shu-cpp-find-h-definition` [Command]
(Alias: getdef)

While in a cpp file, position point on a variable name that is defined in the corresponding header file and invoke this function. It will find all occurrences of the name in the header file and put them in the message area.

`shu-cpp-find-using` **&optional** *top-name* [Command]

Return the name of the class found on the next "using namespace" directive or nil of no such directive found.

top-name, if present is a higher level namespace. Given a top level namespace of "WhammoCorp", then the following line:

```
using namespace WhammoCorp::world;
```

would be interpreted as though it had been written:

```
using namespace world;
```

`shu-cpp-find-variable-name-by-token` *var-name* [Function]
Tokenize the entire buffer and return the position of the first token that matches var-name.

`shu-cpp-find-variable-name-lines-by-token` *var-name* [Function]
Tokenize the entire buffer and return a string that is composed of each line that contains the token.

`shu-cpp-fix-prototype` [Command]
(Alias: fixp)
Place the cursor on the beginning of a function declaration that has been copied from a .cpp file to a .h file. This function fixes up the function prototype to make it suitable for a .h file. For example, this declaration:

```
double Frobnitz::hitRatio(
    const int  reads,
    const int  writes)
const
```

would be transformed into

```
double hitRatio(
    const int  reads,
    const int  writes)
const;
```

`shu-cpp-general-set-alias` [Function]
Set the common alias names for the functions in shu-cpp-general. These are generally the same as the function names with the leading shu- prefix removed.

`shu-cpp-get-variable-name` [Function]
If point is sitting on something that looks like a legal variable name, return it, otherwise, return nil.

`shu-cpp-get-variable-name-position` [Function]
If point is sitting on something that looks like a legal variable name, return a cons cell that contains the start and end positions of the name otherwise, return nil.

`shu-cpp-internal-stream-check` *token-list* [Function]
Take a list of tokens found in a C++ streaming operation and check to ensure that every other token is a << operator. Two adjacent occurrences of << represent an extraneous << operator. Two adjacent occurrences of tokens that are not << represent a missing << operator.

`shu-cpp-is-enclosing-op` *op* [Function]
Return true if the single character in *op* is an enclosing character, a left or right parenthesis or a left or right square bracket.

`shu-cpp-member-prefix` [Variable]
The character string that is used as the prefix to member variables of a C++ class. This is used by shu-internal-get-set when generating getters and setters for a class.

`shu-cpp-qualify-classes` *class-list namespace buffer* [Function]
Repeatedly call *shu-qualify-class-name* for all class names in *class-list*. *namespace* is either the name of a single namespace to apply to all classes in *class-list* or is a list of namespaces each of which has a one to one correspondence with a class name in *class-list*. The optional *buffer* argument may be a buffer in which the actions are recorded. Return the number of names changed.

`shu-cpp-rmv-blocked` *class-list top-name gb* [Function]
Do a pre-check on a file to see if we will be able to remove its "using namespace" directives. *class-list* is the a-list passed to *shu-cpp-rmv-using*. USING is the regular expression used to search for "using namespace" directives. TOP-QUAL is the regular expression used to strip out a higher level qualifier from the class name in a "using namespace" directive, if any. *gb* is the buffer into which diagnostic messages are written.

This function finds all of the "using namespace" directives in the file

and checks to see if there is any ambiguity in the resulting class list. For example, if namespace "mumble" contains class "Bumble" and namespace "stubble" also contains class "Bumble", we will not know which namespace to apply to instances of class "Bumble". But this is not an ambiguity if there is a "using namespace" directive for only one of those classes. That is why we do the ambiguity check only for namespaces referenced by "using namespace" directives.

This function returns true if such an ambiguity exists.

`shu-cpp-rmv-using-old` *class-list* **&optional** [Function]

Remove "using namespace" directives from a C++ file, adding the appropriate namespace qualifier to all of the unqualified class names. *class-list* is an a-list in which the car of each entry is a namespace and the cdr of each entry is a list of class names. Here is an example of such an a-list:

```
(list
 (cons ``std''    (list ``set'' ``string'' ``vector''))
 (cons ``world''  (list ``Hello'' ``Goodbye'')))
```

top-name, if present is a higher level namespace. Given a top level namespace of "WhammoCorp", then the following line:

```
using namespace WhammoCorp::world;
```

would be interpreted as though it had been written:

```
using namespace world;
```

NB: This version is deprecated. See the new version in shu-match.el

`shu-cpp1-class` *class-name* [Command]
(Alias: cpp1-class)

Place a skeleton class definition in the current buffer at point.

`shu-cpp2-class` *class-name* [Command]
(Alias: cpp2-class)

Place a skeleton class definition in the current buffer at point.

`shu-creplace` [Command]
(Alias: creplace)

This function will replace the C++ string in which point is placed with the C++ string in the kill ring. The C++ string in the kill ring is expected to be a single string with or without quotes. The C++ string in which point is placed may have been split into smaller substrings in order to avoid long lines.

Assume you have the sample string that is shown in *shu-csplit*

```
static const std::string x(‘‘This is a very long line of text that look’’
                           ‘‘s as though it will go on forever.’’);
```

You wish to replace it with a slightly different line of text, perhaps something that came from the output of a program. Copy the new string into the kill ring. Then put the cursor into any part of any line of the string to be replaced and invoke this function. This function will remove the old string, replace it with the contents of the string in the kill ring, and then split it up into shorter lines as in the following example. The string in the kill ring may have opening and closing quotes or not.

```
static const std::string x(‘‘This is a very long line of text that look’’
                           ‘‘s as though it will go on forever and prob’’
                           ‘‘ably already has done so or is threatening’’
                           ‘‘ to do so.’’);
```

This is especially useful if you have a a string constant in a unit test and you have modified the code that creates the string. gtest will complain that the expected string did not match the actual string. If the actual string is correct, copy it into the kill ring, go into your unit test, find the old string, place the cursor in the old string, and replace it with the new.

`shu-csplit` [Command]
(Alias: csplit)

Split a C++ string into multiple strings in order to keep the line length below a certain minimum length, currently hard coded to column 76.

For example, you may copy a very long line of text into a section of code as follows:

```
static const std::string x(``This is a very long line of text that looks as though
```

To be polite to future code readers, you want to split this into multiple lines. This can be a bit cumbersome if the text is very long. This function splits the text at a somewhat arbitrary boundary so that it can be read by others whose text editors do not show code much beyond column 80 or so. This is an example of the above line after csplit was invoked:

```
static const std::string x(``This is a very long line of text that look''
                           ``s as though it will go on forever.'');
```

`shu-cunsplit` [Command]
(Alias: cunsplit)

The beginnings of a re-write of *shu-cunsplit*. Needs more testing. Undo the split that was done by csplit. Place the cursor anywhere in any of the strings and invoke this function.

`shu-cwhile` [Command]
(Alias: cwhile)

Insert an empty while statement.

`shu-dbx-summarize-malloc` [Command]
(Alias: dbx-malloc)

Go through the output of a dbx malloc dump and generate a summary. dbx is the AIX debugger. It has a malloc command that goes through the heap and prints one line for every allocated buffer. Here is a sample of some of its output:

```
    ADDRESS         SIZE HEAP    ALLOCATOR
 0x30635678          680    0     YORKTOWN
 0x30635928          680    0     YORKTOWN
 0x30635bd8          680    0     YORKTOWN
```

YORKTOWN is the name of the default allocator on AIX. This function goes through the malloc output and gets the number and sizes of all buffers allocated. This tells you how many buffers were allocated, the total number of bytes allocated, and the total number of buffers allocated by size. The output is placed in a separate buffer called {**shu-aix-malloc**.}

`shu-dcc` [Command]
(Alias: dcc)

Place a skeleton Doxygen header definition at point.

`shu-dce` [Command]
(Alias: dce)

Place a skeleton Doxygen header definition at point.

`shu-dciterate` *type-name var-name-1 var-name-2* [Command]
(Alias: dciterate)

Insert the code to iterate through a pair of data structures of type *type-name*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first prompt reads the type name, second and third prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name::const_iterator,
               type-name::const_iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`shu-diterate` *type-name var-name-1 var-name-2* [Command]
(Alias: diterate)

Insert the code to iterate through a pair of data structures of type *type-name*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first prompt reads the type name, second and third prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name::iterator,
               type-name::iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`shu-dox-brief` [Command]
(Alias: dox-brief)
Place a skeleton Doxygen header definition at point.

`shu-dox-cbt` [Command]
(Alias: dox-cbt)
Convert a section of comments delimited by //! into Doxygen brief format.

`shu-dox-cvt` [Command]
(Alias: dox-cvt)
Convert a section of comments delimited by // into Doxygen format.

`shu-dox-hdr` [Command]
Place a skeleton Doxygen header definition at point.

`shu-dox2-hdr` [Command]
(Alias: dox2-hdr)
Place a skeleton Doxygen header definition at point.

`shu-drc` [Command]
(Alias: drc)
Place a skeleton Doxygen header definition at point.

`shu-emit-get` [Function]

Undocumented

`shu-emit-set` *arg* [Function]
Undocumented

`shu-gen-return-ptr` [Function]
Undocumented

`shu-get-set` [Command]
(Alias: get-set)
Generate get and set functions for an instance variable in a C++ class. Position the cursor ahead of the Doxygen comment above the variable. The get and set functions will be placed in the buffer {*get-set*.}

`shu-getters` *start end* [Command]
(Alias: getters)
Mark a region in a file that contains C++ instance variable declarations. This function will create get and set functions for all of the instance variables.

`shu-ginclude` [Command]
(Alias: ginclude)
While in a file buffer, wrap the file name in a C++ include directive and put it in the kill ring. The file name is delimited by double quotes unless *shu-cpp-include-user-brackets* variable is true, in which case the file name is delimited by left and right angle brackets.

`shu-interactive-qualify-class-name` [Command]
(Alias: qualify-class)
Interactively call *shu-qualify-class-name* to find all instances of a class name and add a namespace qualifier to it. First prompt is for the class name. If a fully qualified class name is supplied, then the given namespace is applied to the class name. If the name supplied is not a namespace qualified class name, then a second prompt is given to read the namespace. This is intended to help rescue code that has one or more "using namespace" directives in it. The problem with "using namespace" is that you now have class names from other namespaces with no easy way to identify the namespace to which they belong. The best thing to do is get rid of the "using namespace" statements and

explicitly qualify the class names. But if you use a simple replace to do that, you will qualify variable names that resemble class names as well as class names that are already qualified. This function only adds a namespace to a class name that does not already have a namespace qualifier.

`shu-internal-citerate` *type-name var-name* **&optional** [Function]

Insert the code to iterate through a data structure of type *type-name* whose instance is identified by *var-name*. First prompt reads the variable name. Second prompt read the variable name.

The generated code sequence is as follows:

```
for (type_name::iterator it = var_name.begin();
     it != var_name.end(); ++it)
{
}
```

If optional *const* is true, a const iterator is generated.

`shu-internal-cpp2-class` *class-name* [Function]

Place a skeleton class definition in the current buffer at point.

`shu-internal-double-citerate` *type-name-1* [Function]
var-name-1 var-name-2 *cons*

Insert the code to iterate through a pair of data structures of types *type-name-1* and *type-name-2*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The generated code sequence is as follows:

```
for (std::pair<type-name-1::const_iterator,
               type-name-2::const_iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

If optional *const* is true, a const iterator is generated.

`shu-internal-get-set` *comment shu-lc-comment* [Command]
Generate get and set functions for an instance variable in a C++ class.

`shu-internal-replace-class-name` *target-name replace-arg in-string* [Function]
Find all instances of the class name *target-name* and if it actually appears to be a class name, call REPLACE-FUN passing to it *replace-arg* and the class name. REPLACE-FUN issues the appropriate replace-match call, constructing the replacement for the class name from some combination of *replace-arg* and the class name. *in-string* is true if a class name inside of a string is to be replaced. *in-comment* is true if a class name inside of a comment is to be replaced.

`shu-is-const` [Variable]
Set true if the C++ data member we are working is declared to be const.

`shu-lc-comment` [Variable]
Comment string with the first letter downcased.

`shu-make-padded-line` *line tlen* [Function]
Add sufficient spaces to make *line* the length *tlen*.

`shu-nc-vtype` [Variable]
Set true if the C++ data member we are working is declared to be non-const.

`shu-new-c-class` [Command]
(Alias: new-c-class)
Place a skeleton class definition in the current buffer at point.

`shu-new-c-file` [Command]

(Alias: new-c-file)
Generate a skeleton code file for a C or C++ file.

`shu-new-deallocate` *var-name class-name* [Command]
Insert the code to do a standard deallocation of memory allocated by a specific allocator. First prompt reads the variable name that points to the memory to be deallocated. Second prompt reads the name of the class whose destructor is to be called.

This generates a code sequence as follows:

```
if (var-name)
{
    var-name->~class-name();
    m_allocator->deallocate(var-name);
    var-name = 0;
}
```

var-name and *class-name* are read from two prompts. The number of spaces to indent inside that braces is defined in the custom variable shu-cpp-indent-length. The name of the member variable that points to the allocator in use by the class comes from the custom variable shu-cpp-default-allocator-name

`shu-new-h-file` [Command]
(Alias: new-h-file)
Generate a skeleton header file for C or C++ file.

`shu-new-x-file` [Command]
(Alias: new-x-file)
Generate a skeleton Doxygen
file directive.

`shu-operators` *class-name* [Command]
(Alias: operators)
Place skeletons of all of the standard c++ operator functions at point.

`shu-qualify-class-fun` *namespace name* [Function]
This is the replacement function for *shu-qualify-class-name*. It is called with the *namespace* to be applied to the class whose name is *name*. It constructs a new name and issues replace-match to replace it.

`shu-qualify-class-name` *target-name namespace* [Function]

Find all instances of the class name *target-name* and add an explicit namespace qualifier *namespace*. If the *target-name* is "Mumble" and the *namespace* is "abcd", then "Mumble" becomes "abcd::Mumble". But variable names such as "d_Mumble" or "MumbleIn" remain unchanged and already qualified class names remain unchanged. This is intended to help rescue code that has one or more "using namespace" directives in it. The problem with "using namespace" is that you now have class names from other namespaces with no easy way to identify the namespace to which they belong. The best thing to do is get rid of the "using namespace" statements and explicitly qualify the class names. But if you use a simple replace to do that, you will qualify variable names that resemble class names as well as class names that are already qualified. This function only adds a namespace to a class name that does not already have a namespace qualifier.

`shu-qualify-namespace-bsl` [Command]

(Alias: qualify-bsl)

Add "bsl" namespace qualifier to some of the classes in "bsl". Return the count of class names changed.

`shu-qualify-namespace-std` [Command]

(Alias: qualify-std)

Add "std" namespace qualifier to some of the classes in "std". Return the count of class names changed.

`shu-replace-class-fun` *new-name name* [Function]

This is the replacement function for *shu-replace-class-name*. It is called with the *new-name* to replace the class *name*. It calls replace-match to replace *name* with *new-name*.

`shu-replace-class-name` *target-name new-name* [Function]
in-string in-comment

Find all instances of the class name *target-name* and replace it with the name *new-name*. If the target name is "Mumble", then all instances of "Mumble" that resemble class names are replaced. But names such as "d_Mumble" or "MumbleIn" remain unchanged. if *in-string* is true, then instances of the class name found inside a string are replaced. if

in-comment is true, then instances of the class name found inside a comment are replaced.

`shu-return-ptr` [Function]
Undocumented

`shu-return-ref` [Function]
Undocumented

`shu-rmv-classes` [Variable]
An alist of "using namespace" directives and their line numbers where first declared. Used to filter duplicates.

`shu-s-mode-find-long-line` [Command]
Place point in column 79 of the next line whose length exceeds 79 characters. No movement occurs if no lines, starting with the current position, exceed 79 characters in length.

`shu-set-author` *name* [Command]
Set the author name to be placed in generated C++ classes.

`shu-set-default-global-namespace` *name* [Command]
Set the global namespace for C++ classes.

`shu-set-default-namespace` *name* [Command]
(Alias: set-default-namespace)
Set the local namespace for C++ classes.

`shu-set-obj` [Function]
Undocumented

`shu-set-ptr` [Function]
Undocumented

`shu-simple-hother-file` [Function]
Return the name of the .h file that corresponds to the .cpp file or .t.cpp file that is in the current buffer. This version of the function creates the name of the .h file from the name of the file in the current buffer. This is in contrast with the function shu-hother which finds the corresponding

.h file from the list of files in the current project.

`shu-tciterate` *type-name-1 type-name-2 var-name-1* [Command]

(Alias: tciterate)

Insert the code to iterate through a pair of data structures of types *type-name-1* and *type-name-2*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first two prompt reads the two type names, third and fourth prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name-1::const_iterator,
               type-name-2::const_iterator>
         its(var-name-1.begin(), var-name-2.begin());
     its.first != var-name-1.end() \&\& its.second != var-name-2.end();
     ++its.first, ++its.second)
{
}
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`shu-titerate` *type-name-1 type-name-2 var-name-1* [Command]

(Alias: titerate)

Insert the code to iterate through a pair of data structures of types *type-name-1* and *type-name-2*, whose first instance is identified by *var-name-1* and whose second instance is identified by *var-name-2*.

The first two prompt reads the two type names, third and fourth prompts read the two variable names.

The generated code sequence is as follows:

```
for (std::pair<type-name-1::iterator,
               type-name-2::iterator>
```

```
            its(var-name-1.begin(), var-name-2.begin());
        its.first != var-name-1.end() \&\& its.second != var-name-2.end();
        ++its.first, ++its.second)
    {
    }
```

The number of spaces to indent inside the braces is defined in the custom variable shu-cpp-indent-length.

The name of the namespace used for the standard library is defined in the custom variable shu-cpp-std-namespace.

`shu-to-snake` [Command]
(Alias: to-snake)

Convert the variable name at point from camel case to snake case.

For example, "mumbleSomethingOther" becomes "mumble_something_other".

`shu-var-name` [Variable]

The variable name that corresponds to an attribute name.

7 shu-cpp-match

Functions to match patterns against list of tokens produced by shu-cpp-token.el.

The functions in shu-cpp-token.el can scan a section of C++ source code and turn it into a list of tokens. Each token has a type (comment, string, keyword, operator or unquoted token) and a value, which is the token itself. Each token also contains its start and end position within the file.

The functions in this file, shu-cpp-match.el, allow one to use data structures to describe patterns to be found in a list of tokens.

The simplest data structure consists of a list of match items that must exactly match a list of tokens. If you want to find something that looks like

```
pointer->thing
```

you put together a list of three match items. The first specifies a regular expression that can match a C++ name. The second is an exact match for the operator "->", and the third is another regular expression that can match a C++ name.

You can also search for more than one pattern at a time by supplying a list of lists of match items. Suppose you want to search for an occurrence of a "using namespace" directive. You might have one list that matches "using namespace name;", another list that matches "using namespace ::name;", and another list that matches "using namespace component::name";.

If you try to match this set of three lists against the following string

```
using namespace thing::Bob;
```

The three lists are evaluated as follows:

The first list matches "using," "namespace," "thing," but fails when it does not find a semi-colon following "thing."

The second list matches "using," "namespace," but fails when it does not find an operator "::".

The third list matches "using," "namespace," "thing," "::," "Bob," and ";".

With one function call, you have found a reasonably complex pattern. The tokens scanned do not include comments. This means that the above example would have worked identically on a list of tokens derived from

```
using /* Hello \emph{*/} namespace
// Something here
thing /* How are you? \emph{*/} :: Bob ;
```

A list of match items can also include a side list. A side list is another list of match items that is to be matched. There are different types of side lists. One of them is a repeating side list. A repeating side list matches zero or more occurrences of a list.

In the above example, we matched the name thing::Bob by having three match items. But what if we want to match an arbitrary nesting of namespaces, such as

```
thing::Bob::Fred::Ted
```

One way to do this is with a repeating side list.

This list of tokens above could be matched by a single match item followed by a repeating side list. The first item in the list is a regular expression match for a C++ name. The second item in the list is a repeating side list, which contains two items, the first of which is an exact match for operator "::", and the second of which is a regular expression that matches a C++ name.

The match would work as follows:

The first match item would match "thing". Then the repeating side list would match "::," "Bob," "::," "Fred," "::," and "Ted."

On return from a successful match, how do you know what was matched? Each match item can specify that when the item is matched, the matched item is to be added to a list of items to be returned to the caller.

Let us return to our original example in which we had three lists, the last of which finally matched.

```
          *       *     *
using namespace thing::Bob
```

An asterisk has been placed over each item that is marked to be returned to the caller. At the end of the match, the matching function would return the list

```
namespace
thing
Bob
```

Now the caller knows what was matched and has a copy of the matched tokens.

In our example of matching a nested namespace name, the function might return

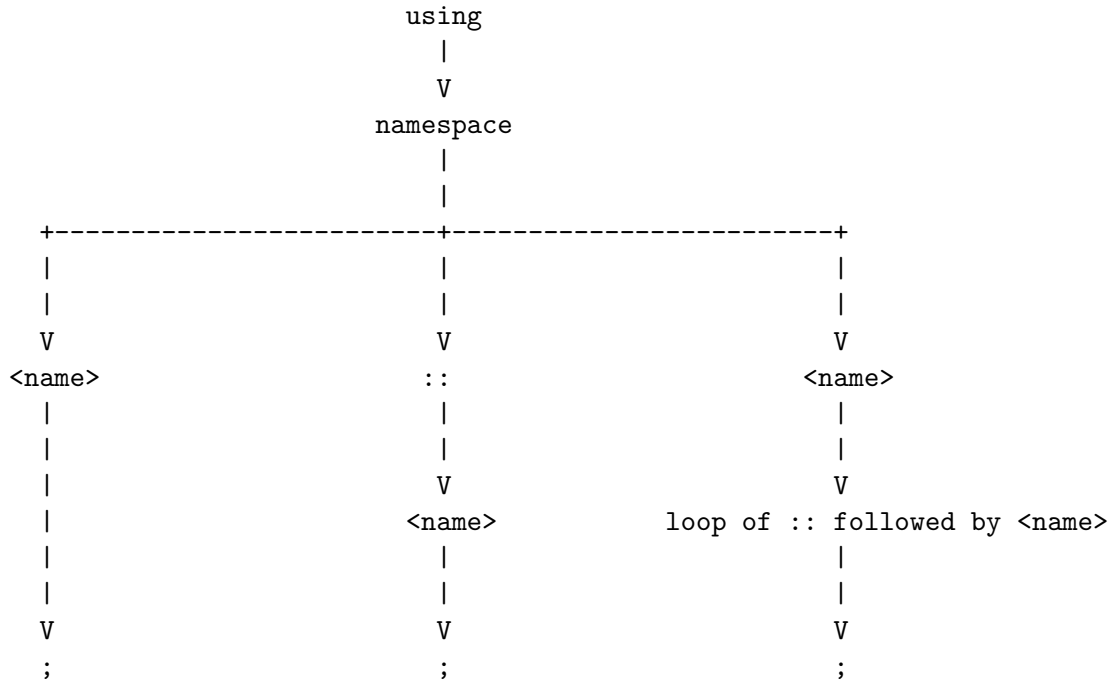
```
thing
Bob
Fred
Ted
```

Now the caller can tell from the length of the list, how deeply nested the namespace name is.

Note that since the matched tokens are pushed onto the list, the list is actually returned in reverse order, which the caller can reverse with nreverse.

Each matching function also accepts a return list to which it will add newly matched items. The caller can then match several patterns that build up an ever expanding return list of tokens. Only the caller knows when it makes sense to reverse the list and to then start processing the reversed list.

A final example is the list of match items that is actually used elsewhere to find occurrences of using namespace directives. It uses another type of side list, which is a list of lists. This is an illustration of that match structure:



This is how the above match structure would match

```
using namespace thing::Bob::Ted;
```

The first two tokens "using" and "namespace" are matched exactly. The we come to three lists to be evaluated. The first one matches "thing" but fails to match the ";". The second fails trying to match "::". The third matches "thing" and then the repeating side list matches "::," "Bob", "::," and "Ted." The repeating

side list stops the matching when it encounters the terminating semi-colon, and then the next match item in the list matches the terminating semi-colon.

The returned list would be

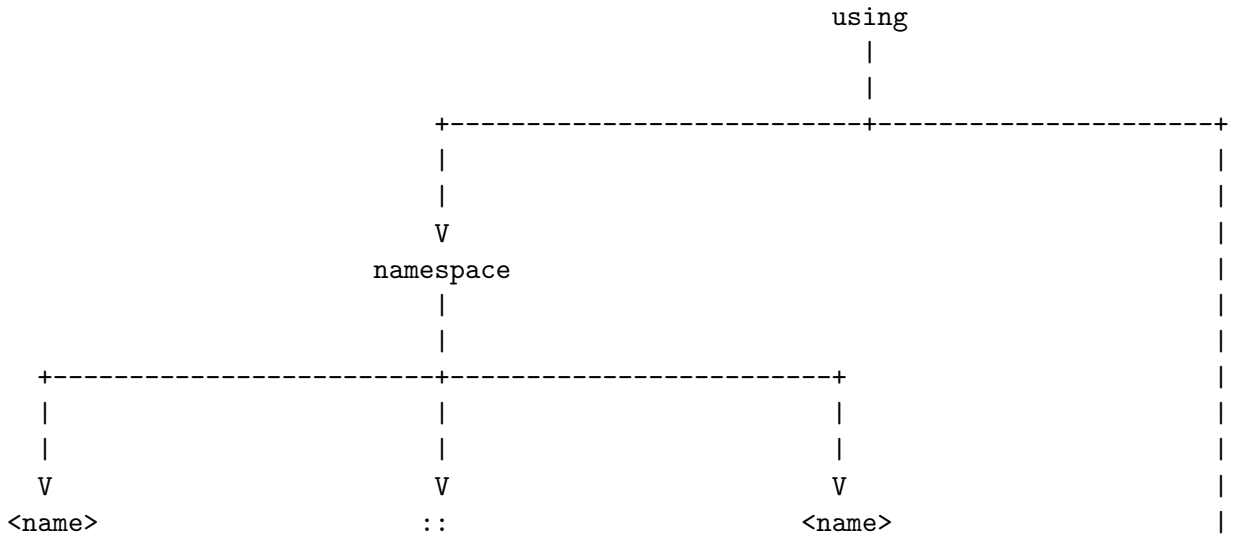
```
using
namespace
thing
Bob
Ted
```

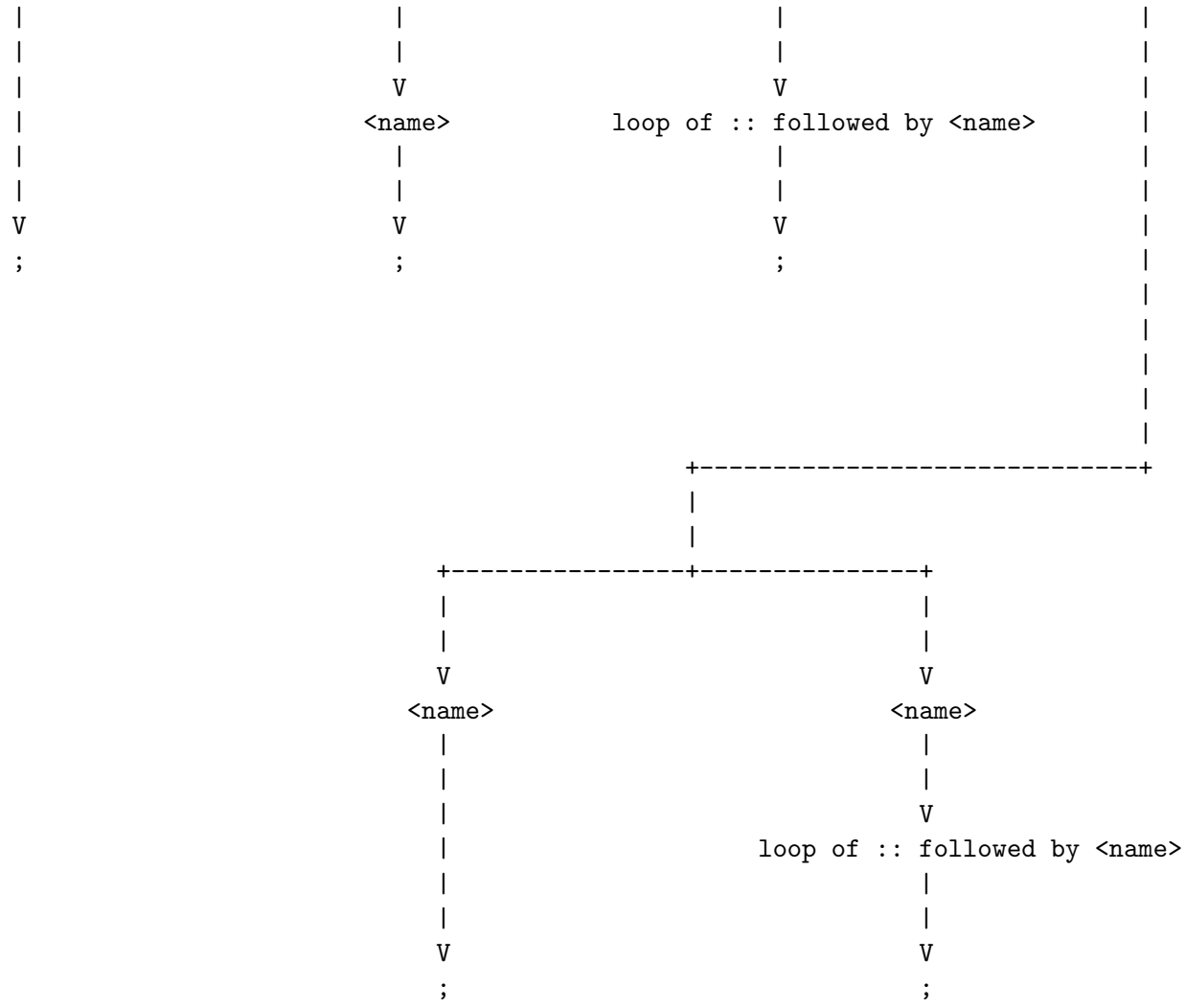
You can look in the unit tests and in other code that uses the matching code here for more examples of the power of match lists.

Here is an example taken from shu-match.el. This match list is used to find all forms of the using statement, including

```
using namespace name;
using namespace ::name;
using namespace name::name;
using name;
using name::name;
```

The actual data structures that define this match list are found in shu-match.el in the constant shu-cpp-match-using-list-single, which is used by the function shu-match-find-all-using-internal, which returns all statements in the above form with one pass through the token list.





7.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-cpp-all-search-match-tokens` *rlist match-list* [Function]

Repeatedly call shu-cpp-search-match-tokens until there are no remaining tokens to match. If the return value is nil, there were no tokens found to match.

If the return value is non-nil, its *rlist* is the list of all of the returned tokens from all of the matches.

`shu-cpp-internal-sub-match-tokens` *rlist mlist* [Command]

Do the matching for one list only.

`shu-cpp-make-match-info` *op-code match-eval-func match-token-type* [Function]

Return a match-info structure from the given arguments

`shu-cpp-make-match-side-list` *op-code match-list side-parameter* [Function]

Return a match-info structure from the given arguments that represents a side list.

`shu-cpp-match-evaluate-side-list` *op-code rlist match-info* [Function]

Evaluate a side list in a match list. Use the op-code in the match item to find the function that should evaluate the side list.

`shu-cpp-match-extract-info` *match-info op-code match-ret-ind match-token-value* [Macro]

Extract the information out of a match-info

`shu-cpp-match-extract-op-code` *match-info* [Function]

Return the op code from the match-info.

`shu-cpp-match-extract-side-list` *match-info op-code side-parameter* [Macro]

Extract the side-list information out of a match-info that represents a side-list..

`shu-cpp-match-extract-side-list-only` *match-info* [Function]

Extract only the side list from the match info. This is in contract to shu-cpp-match-extract-side-list, which extracts all of the properties of a side list.

`shu-cpp-match-extract-token` *match-info* [Function]

Return the token from the match-info.

`shu-cpp-match-extract-type` *match-info* [Function]

Return the token type from the match-info.

`shu-cpp-match-is-side-list` *op-code* [Function]
Return true if the *op-code* represents a side list operation.

`shu-cpp-match-many-list` *rlist token-list* [Function]

Do a recursive call to shu-cpp-match-tokens.

`shu-cpp-match-op-code-name` *op-code* [Function]
Return the name of an op-code.

`shu-cpp-match-or-list` *rlist token-list match-info* [Function]
rlist points to the current return value list, if any. *token-list* points to the next token-info to match. *match-info* is the head of the side list with which to match. The match succeeds if the first token-info in *token-list* matches any of the match-info members of *match-info*. If the match fails, return nil. If the match succeeds, return a cons cell pointing to two items. The car is the next token-info in *token-list*. The cdr is the return list, *rlist*. *rlist* remains unchanged if the match-info that matched did not specify that the matched token-info was to be returned.

`shu-cpp-match-repeat-list` *rlist token-list* [Function]

rlist points to the current return value list, if any. *token-list* points to the next token-info to match. *match-info* is the head of the side list with which to match. The match succeeds if the token-infos in *token-list* match all of the match-infos in MATCH-LIST zero or more times. The token-infos are matched repeatedly against the match-infos. If there is a failure matching the first match-info, the match is successful. If there is a failure matching any other match-info, the match fails.

This is useful when matching repeating but optional patterns. For example, a C++ name could be any of the following:

```
a
a::b
a::b::c
```

You can match this with a match list that requires an unquoted token that matches a C++ name, followed by a side list looking for operator "::" followed

by an unquoted token. If there is no match, then you have an unqualified name. If it matches once, you have a name with one level of qualification. But if it fails in the middle, then you have found something that looks like "a::", which is not a valid C++ name.

`shu-cpp-match-repeat-sub-list` *rlist token-list* [Function]

Go through one iteration of the repeating list. The iteration is considered a success if either of the following are true: 1. The first match fails, or 2. All matches succeed. If all matches succeed, the updated *rlist* and *token-list* are returned. If the first match fails, the *rlist* and *token-list* are returned unaltered. It is as though no match was ever attempted. If some match other than the first fails, nil is returned. If the *token-list* is nil on entry, this is the equivalent of a first match failure.

`shu-cpp-match-tokens` *rlist match-lists token-list* [Function]

match-lists is a list of match lists. *token-list* is a list of tokens. *rlist* is either nil or an existing list of returned tokens on which to build. For each match-list in *match-lists*, try to match every element of the match list to the token list. if a match fails or if you reach the end of the token list before reaching the end of the match list, move to the next match list and try again. if all elements of a match list match the tokens in the token list, stop the matching process and return (pushed onto RLIST) a list which consists of matched tokens whose corresponding entry in the match list indicated that the matched token was to be added to the list to be returned.

`shu-cpp-search-match-tokens` *rlist match-list* [Command]

A function that advances through the *token-list* until the first item in the single *match-list* matches the token. If that happens, try to match the whole list. If the whole list is matched, return. If the whole list does not match, restore the original *rlist* and *token-list* and continue. Return only when the whole list is matched or the *token-list* is exhausted.

This could be extended to multiple lists by having the search part check for a match with the head of any of the lists in order. When the head of one list matches, pursue that list. If the list match fails, move to the next list. When no list head or entire list matches the current token, then move to the next token.

`shu-cpp-side-list-functions` [Constant]

A-list that maps a side list op-code to the function that implements it.

`shu-cpp-token-match-same` *match-info token-info* [Function]
Perform a single match operation between an item in a token list and an item in a match list. The token types must be the same and the token value in the match list must be the same as the token value in the token list.

`shu-cpp-token-match-same-rx` *match-info token-info* [Function]
Perform a single match operation by regular expression between an item in a token list and an item in a match list. The token types must be the same and the regular expression in the match list must match (via string-match) the token in the token list.

`shu-cpp-token-match-skip` *tlist* [Function]
Skip one cell in the input list.

`shu-cpp-token-match-type-non-loop-max` [Constant]
The maximum match type value that does not indicate a side loop.

`shu-cpp-token-match-type-same` [Constant]
The match type constant that indicates that the token type and token value must both match.

`shu-cpp-token-match-type-same-rx` [Constant]
The match type constant that indicates that the token type must match and the token value must satisfy the regular expression for a C++ variable name.

`shu-cpp-token-match-type-side-choose` [Constant]
The match side constant that indicates a choice. The match is considered a success if any one item in the side list matches the current token.

`shu-cpp-token-match-type-side-loop` [Constant]
The match side constant that indicates a looping side list. The token list must match the side list zero or more times. If the first item in the list does not match, this is considered a success. If the first item matches, then all items in the side list must match. If all items in the side list match, we go back to the top of the side list and try again until we find a token that does not match the first item in the side list. The match is considered a failure only of there is a partial match between the tokens and the side list.

`shu-cpp-token-match-type-side-many` [Constant]
The match side constant that indicates a choice among multiple lists. This

does a recursive call to shu-cpp-match-tokens.

`shu-cpp-token-match-type-skip` [Constant]
The match type constant that indicates skip one input cell.

`shu-cpp-token-show-match-info` *match-info* [Function]
Show the data in an instance of match-info.

`shu-cpp-token-show-match-info-buffer` *match-info gb* [Function]
Show the data in an instance of match-info.

`shu-cpp-token-show-match-list` *match-list* **&optional** [Function]

Show the data in an instance of match-info.

`shu-cpp-token-show-match-lists` *match-lists* [Function]
title
Show the data in an instance of match-info.

8 shu-cpp-misc

A collection of useful functions for dealing with C++ code

8.1 List of functions by alias name

A list of aliases and associated function names.

`acgen` *class-name* [Command]
(Function: shu-cpp-acgen)
Generate a skeleton class code generation at point.

`ccdecl` *class-name* [Command]
(Function: shu-cpp-ccdecl)
Generate a skeleton class declaration at point.

`ccgen` *class-name* [Command]
(Function: shu-cpp-ccgen)
Generate a skeleton class code generation at point.

`cdecl` *class-name* [Command]
(Function: shu-cpp-cdecl)
Generate a skeleton class declaration at point.

`cgen` *class-name* **&optional** *use-allocator* [Command]
(Function: shu-cpp-cgen)
Generate a skeleton class code generation at point.

`dox-file` [Command]
(Function: shu-dox-file)
Place a skeleton Doxygen file definition at point.

`fline` [Command]
(Function: shu-fline)
Place a stream of __FILE__ and __LINE__ at point.

`gen-component` *class-name* [Command]
(Function: shu-gen-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

`hcgen` *class-name* [Command]
(Function: shu-cpp-hcgen)

Generate a skeleton class code generation at point.

8.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-cpp-acgen` *class-name* [Command]
(Alias: acgen)
Generate a skeleton class code generation at point.

`shu-cpp-ccdecl` *class-name* [Command]
(Alias: ccdecl)
Generate a skeleton class declaration at point.

`shu-cpp-ccgen` *class-name* [Command]
(Alias: ccgen)
Generate a skeleton class code generation at point.

`shu-cpp-cdecl` *class-name* [Command]
(Alias: cdecl)
Generate a skeleton class declaration at point.

`shu-cpp-cgen` *class-name* **&optional** *use-allocator* [Command]
(Alias: cgen)
Generate a skeleton class code generation at point.

`shu-cpp-hcgen` *class-name* [Command]
(Alias: hcgen)
Generate a skeleton class code generation at point.

`shu-cpp-inner-cdecl` *class-name copy-allowed use-allocator* [Function]
Generate a skeleton class declaration at point.

`shu-cpp-misc-set-alias` [Function]
Set the common alias names for the functions in shu-cpp-misc. These are generally the same as the function names with the leading shu- prefix removed.

`shu-dox-file` [Command]
(Alias: dox-file)
Place a skeleton Doxygen file definition at point.

`shu-fline` [Command]
(Alias: fline)
Place a stream of __FILE__ and __LINE__ at point.

`shu-gen-component` *class-name* [Command]
(Alias: gen-component)
Generate the three files for a new component: .cpp, .h, and .t.cpp

`shu-generate-cfile` *author namespace class-name* [Function]
Generate a skeleton cpp file

`shu-generate-hfile` *author namespace class-name* [Function]
Generate a skeleton header file

`shu-generate-tfile` *author namespace class-name* [Command]
Generate a skeleton t.cpp file

9 shu-cpp-project

A collection of useful functions for dealing with project files and treating a set of source files in multiple directories as a single project

9.0.1 Toggle back and forth between files

If you are editing a C or C++ file and wish to switch to its associated header file, *shu-hother* will switch to the header file. *shu-cother* will switch back to the original C or C++ file. *shu-tother* will switch to the associated unit test file that ends in "t.cpp."" This set of functions allows you to treat a set of files as a single project.

You define a project by creating a project file. A project file is simply a text file with one or more directory names in it. You select the text in the file and invoke the command shu-make-c-project. This searches the given directories for all of the header files and C and C++ files and remembers where these files are located.

When you want to visit a file you start typing the first few characters of the file name. You can use auto completion to complete the name. Since shu-project knows where all of the files are located, you do not have to remember that. Once you have typed in a complete file name, the file will be visited wherever it happens to reside.

If you have two or more files with the same name in different directories, you will be presented with a menu and asked to select the file you have in mind.

9.0.2 Creating a project file

If you do not have a project file, shu-project gives you a convenient way to create one. Go to the root directory of your project, open a new empty file (I usually call it project.txt), and invoke the command shu-make-c-project. It will prompt you for the root directory with a default being the current directory. It will then find all of the directories at or below the root that contain code and it will place the directory names in the file. Now you have your project file.

9.0.3 File names within the project

shu-project now knows where all of the file names reside so you do not have to remember that. But it does more to simplify your life. Many files in large projects start with a common prefix. If you have a class called ThingLoader, it might be defined in a file called thingloader.h. But in a large project, the full file name might be something like myproject_thingloader.h.

As shu-project is creating the list of file names, it is also creating an index of short names with common prefixes stripped. So if you want to visit myproject_thingloader.h, just type "thing" and hit tab to autocomplete. If no other file starts with "thing", shu-project will autocomplete to "thingloader" and then look in its index to find myproject_thingloader.h.

9.0.4 Visiting related files

If you are in a .cpp file and you want to visit its associated .h file, issue the command shu-hother and you will be taken to the .h file even if it is in a different directory. Similarly, you can visit the associated unit test file (t.cpp) with the command shu-tother to visit the unit test file.

9.0.5 Visiting files based on error messages

You compile a file and the compiler complains ...

```
..\myproject_thingloader.cpp:190:6: error: Invalid type for ...
```

Simply place the cursor under any part of the file name and type Ctl-x h. shu-project will take you to line 190, column 6 of myproject_thingloader.cpp.

9.1 List of functions by alias name

A list of aliases and associated function names.

`clear-c-project` [Command]
(Function: shu-clear-c-project)
Clear an existing project, if any.

`clear-prefix` [Function]
(Function: shu-clear-prefix)
Clear the default file name prefix for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`cother` [Command]
(Function: shu-cother)
Visit a .cpp file from the corresponding .t.cpp or .h file. If visiting a t.cpp or .h file, invoke this function and you will be taken to the corresponding .cpp or .c file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`count-c-project` [Command]
(Function: shu-count-c-project)

Count the number of lines of code in a project. The final count is shown in the minibuffer. The counts of individual subdirectories are stored in the temporary buffer {*shu-project-count*}

`hother` [Command]
(Function: shu-hother)

Visit a .h file from the corresponding .cpp or t.cpp file. If visiting a .cpp or t.cpp file, invoke this function and you will be taken to the corresponding .h file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`list-c-directories` [Command]
(Function: shu-list-c-directories)

Insert into the current buffer the names of all of the directories in a project.

`list-c-prefixes` [Command]
(Function: shu-list-c-prefixes)

List all of the file prefixes found in the current project, if any. See the docstring for *shu-project-split-file-name* for further information about extracted file prefixes.

`list-c-project` [Command]
(Function: shu-list-c-project)

Insert into the current buffer the names of all of the code files in the current project.

`list-completing-names` [Command]
(Function: shu-cpp-list-completing-names)

List all of the names that are used to do a completing read of a file name along with the names of the actual files to which they map.

`list-project-names` [Command]
(Function: shu-cpp-list-project-names)

List all of the names in a project with the names of the files to which they map.

`list-short-names` [Command]
(Function: shu-cpp-list-short-names)

List all of the short names in a project with the names of the files to which

they map.

`make-c-project` *proj-root* [Command]
(Function: shu-make-c-project)
Create a project file of all directories containing c or h files. Starts at the specified root directory and searches all subdirectories for any that contain c or h files. It then inserts all of the directory names into the current file at point.

`other` [Command]
(Function: shu-other)
Visit an h file from a c file or a c file from an h file If visiting a .h file, invoke this function and you will be taken to the .c or .cpp file. If visiting a .c or .cpp file, invoke this function and you will be taken to the corresponding .h file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`renew-c-project` [Command]
(Function: shu-renew-c-project)
Renew a previously established project to pick up any new files.

`set-c-project` *start end* [Command]
(Function: shu-set-c-project)
Mark a region in a file that contains one subdirectory name per line. Then invoke set-c-project and it will find and remember all of the c and h files in those subdirectories. You may then subsequently visit any of those files by invoking M-x vh which will allow you to type in the file name only (with auto completion) and will then visit the file in the appropriate subdirectory. If this function is called interactively, it clears the project name that was established by either *shu-setup-project-and-tags* of *shu-visit-project-and-tags*.

`set-dir-prefix` *prefix* [Command]
(Function: shu-set-dir-prefix)
Set the default file name prefix to be the current directory name end for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`set-prefix` *prefix* [Command]
(Function: shu-set-prefix)
Set the default file name prefix for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`tother` [Command]
(Function: shu-tother)

Visit a t.cpp file from the corresponding .cpp or .h file. If visiting a .c or .cpp file, invoke this function and you will be taken to the corresponding .t.cpp file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`which-c-project` [Command]
(Function: shu-which-c-project)

Identify the current project by putting into a project buffer the name of the file from which the project was derived as well as the name of all of the directories in the project. Then switch to that buffer. The idea is to invoke this function, look at the results in that buffer, and then quit out of the buffer.

9.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-add-cpp-c-extensions` *xtns* [Function]

Add one or more file extensions to the list of C and C++ extensions recognized by the C package functions. Argument may be a single extension in a string or a list of strings. This modifies both shu-cpp-c-extensions and shu-cpp-extensions.

`shu-add-cpp-h-extensions` *xtns* [Function]

Add one or more file extensions to the list of C and C++ extensions recognized by the C package functions. Argument may be a single extension in a string or a list of strings. This modifies both shu-cpp-h-extensions and shu-cpp-extensions.

`shu-add-cpp-package-line` *dir-name* [Function]

Called with point at the beginning of the line. Take the whole line as the name of a directory, look into the directory, and create an alist of all of the files in the directory as described in shu-cpp-subdir-for-package.

`shu-clear-c-project` [Command]
(Alias: clear-c-project)

Clear an existing project, if any.

`shu-clear-prefix` [Function]

(Alias: clear-prefix)

Clear the default file name prefix for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`shu-completion-is-directory` [Variable]

True if we are to use the current directory name as the file name prefix.

`shu-cother` [Command]

(Alias: cother)

Visit a .cpp file from the corresponding .t.cpp or .h file. If visiting a t.cpp or .h file, invoke this function and you will be taken to the corresponding .cpp or .c file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`shu-count-c-project` [Command]

(Alias: count-c-project)

Count the number of lines of code in a project. The final count is shown in the minibuffer. The counts of individual subdirectories are stored in the temporary buffer {*shu-project-count*}

`shu-count-in-cpp-directory` *directory-name pbuf t-h-files t-c-files t-c-count* [Function]

Count the lines of code in each of the code files in the given directory, updating the message in the minibuffer and passing the totals back to the caller.

`shu-cpp-c-extensions` [Constant]

A list of file extensions for all of the C file types we want to find. This is defined as defconst in shu-cpp-base.el but may be modified by shu-add-cpp-c-extensions.

`shu-cpp-c-file-count` [Variable]

This is the count of the number of C files found in the project.

`shu-cpp-choose-file` *assoc-result* [Function]

Choose the file to visit for a given unqualified name. If there is only one file associated with the name then visit it. If there are multiple files put all of the fully qualified file names in the completion buffer and give the user the opportunity to select the desired file. Then visit that file.

`shu-cpp-choose-other-file` *newfile* [Function]

Try to visit a file first within a project and, it not successful, in the current

directory. If no project is in use or if the file does not belong to the project, try to find the file in the current directory. If a file was found and visited, return true.

`shu-cpp-choose-project-file` *newfile* [Function]
Try to visit a file within a project. If a project is in use, try to visit the given file in the list of files that belong to the project. This goes through the standard project selection process, including prompting the user to choose the desired file if more than one file with the same name exists. If a file was found and visited, return true.

`shu-cpp-class-list` [Variable]
This is an alist whose keys are unqualified file names and whose values contain a list of the fully qualified files with the same unqualified name. if *shu-cpp-project-short-names* is nil, this list is identical to the one stored in *shu-cpp-completing-list*.

`shu-cpp-common-completion` [Function]
Called when the user hits enter or clicks mouse button 2 on completion window. At this point the users selected choice is in the current buffer. We get the answer from the current buffer and call the function that is currently pointed to by shu-cpp-completion-target.

`shu-cpp-completing-list` [Variable]
This is an alist whose keys are unqualified file names and whose values contain a list of the fully qualified files with the same unqualified name. If *shu-cpp-project-short-names* is non-nil, then this alist includes the short file names as well.

`shu-cpp-completion-current-buffer` [Variable]
Active buffer just before we have to do a completion.

`shu-cpp-completion-prefix` [Variable]
The default file name prefix when we are looking for a file and point is not sitting on something that appears to be a file name.

`shu-cpp-completion-scratch` [Variable]
Scratch buffer used by C file name completions.

`shu-cpp-completion-target` [Variable]
Global variable used to hold the function to be invoked at the end of the current completion.

`shu-cpp-directory-prefix` [Function]

Get a directory based prefix, which is the last name in the current path. If the current directory is "foo/blah/humbug", the value returned from this function is "humbug"

`shu-cpp-extensions` [Constant]

A list of file extensions for all of the file types we want to find. This is defined as defconst in shu-cpp-base.el but may be modified by shu-add-cpp-c-extensions or shu-add-cpp-h-extensions.

`shu-cpp-final-list` [Variable]

The name of the shared variable that contains the list of directories assembled by shu-make-c-project

`shu-cpp-finish-project` [Function]

Finish constructing a C project from a user file list. The input is KEY-LIST, which is an a-list. The cdr of each entry is the short (unqualified) file name. The cdr of each entry is the fully qualified name. This alist may have duplicate short names. This function produces a new list. The car of each item is still the short (unqualified) file name. The cdr is a list of all of the fully qualified file names to which the short name maps. If a user selects a file that has only one fully qualified file name, we open the file. But if it has more than one fully qualified file name, we have to ask the user which one is wanted.

`shu-cpp-found-extensions` [Variable]

This is a list of all of the file extensions found in the current project. While shu-cpp-extensions contains all of the extensions that we look for. This variable contains those that we actually found in building the current project.

`shu-cpp-h-extensions` [Constant]

A list of file extensions for all of the H file types we want to find. This is defined as defconst in shu-cpp-base.el but may be modified by shu-add-cpp-h-extensions

`shu-cpp-h-file-count` [Variable]

This is the count of the number of H files found in the project.

`shu-cpp-internal-list-names` *name-list type-name* [Function]

Implementation function for *shu-cpp-list-short-names*, *shu-cpp-list-project-names*, and *shu-cpp-list-completing-names*.

`shu-cpp-list-completing-names` [Command]

(Alias: list-completing-names)
List all of the names that are used to do a completing read of a file name along with the names of the actual files to which they map.

`shu-cpp-list-project-names` [Command]
(Alias: list-project-names)
List all of the names in a project with the names of the files to which they map.

`shu-cpp-list-short-names` [Command]
(Alias: list-short-names)
List all of the short names in a project with the names of the files to which they map.

`shu-cpp-prefix-list` [Variable]
This is the list of prefixes removed from the short names if *shu-cpp-project-short-names* is non-nil.

`shu-cpp-project-collapse-list` *key-list* [Function]
key-list is an alist in which the cdr of each item is the unqualified file name and the car of each item is the fully qualified file name, including the path to the file. The output is a different alist in which the car of each item is the unqualified file name and the cdr of each item is the list of fully qualified file names to which the unqualified file name refers.

For example, if *key-list* contains:

```
(‘‘xxx_mumble.h’’ . ‘‘/foo/bar/xxx_mumble.h’’)
(‘‘xxx_stumble.h . ‘‘/foo/bar/xxx_stumble..h’’)
(‘‘xxx_stumble.h . ‘‘/boo/baz/xxx_stumble..h’’)
```

then the returned list will contain

```
(‘‘xxx_mumble.h’’ . ‘‘/foo/bar/xxx_mumble.h’’)
(‘‘xxx_stumble.h . ‘‘/foo/bar/xxx_stumble..h’’ ‘‘/boo/baz/xxx_stumble..h’’)
```

`shu-cpp-project-file` [Variable]
The name of the file from which the current project was read.

`shu-cpp-project-get-list-counts` *proj-list* [Function]

proj-list is an alist whose structure is identical to that of *shu-cpp-class-list*. This function returns a list with three items on it: the number of c / cpp files, the number of h files, and the number of duplicate names found in the list.

`shu-cpp-project-invert-list` *proj-list* [Function]
proj-list is an alist in which the cdr of each item is the unqualified file name and the car of each item is the list of fully qualified file names to which the unqualified name refers. The returned output is a single list of fully qualified file names.

`shu-cpp-project-list` [Variable]
List that holds all of the subdirectories in the current project.

`shu-cpp-project-name` [Variable]
If the current project was established by either *shu-setup-project-and-tags* of *shu-visit-project-and-tags*, this is the name of the interactive function that was invoked by the user to set it up. This is useful when you are in a project and you forgot the name of the interactive function that got you there.

`shu-cpp-project-set-alias` [Function]
Set the common alias names for the functions in shu-cpp-project. These are generally the same as the function names with the leading shu- prefix removed.

`shu-cpp-project-short-names` [Custom]
Set non-nil if shu-cpp-project creates short names for files in a project. A short name is an approximation of the file name that may be easier to type. For example, if all of the files in a project begin with a common prefix (e.g., "x_server_mumble.cpp" and "x_server_stumble.cpp", then the short names for these two files would be "mumble.cpp" and "stumble.cpp". This means that the user does not have to type the prefix in order to find the file. If the user types "mumble.cpp" as the file name, emacs will open the file "x_server_mumble.cpp".

`shu-cpp-project-subdirs` *dir-name level* [Function]
Starting with the directory name *dir-name*. create a list of subdirectories whose head is in *shu-cpp-final-list*, that contains the name of every directory and subdirectory that contains C, C++, or H files. This is used by shu-make-c-project and other functions that wish to discover all directories that might contain source code.

`shu-cpp-project-time` [Variable]
This is the time at which the current project was created.

`shu-cpp-resolve-choice` *full-name-list target* [Function]
Choose from a number of possible file names. We have found an unqualified file name of interest but it resolves to multiple fully qualified file names. Display all of the possibilities in a completion buffer and ask the user to choose the desired one. The string containing the chosen fully qualified file name will then be passed to the function pointed to by target.

`shu-cpp-short-list` [Variable]
This is the list of short names, if there are any. The car of each item is the short name. The cdr of each item is the full path to the associated file name.

`shu-cpp-subdir-for-package` *directory-name* [Function]
Given a subdirectory name return an alist that contains as keys the names of all of the c and h files in the subdirectory, and as values the the fully qualified name and path of the c or h file. So if the directory "/u/foo/bar" contains thing.c and what.h the returned alist would be

```
( (``thing.c'' ``/u/foo/bar/thing.c'')
  (``what.h''  ``/u/foo/bar/what.h'' ) )
```

This allows us to associate the key "thing.c" with the fully qualified name "/u/foo/bar/thing.c".

`shu-cpp-target-file-column` [Variable]
If non-nil, this represents the column number that is to be located after a file is visited by vh() and has gone through buffer completion selection.

`shu-cpp-target-file-line` [Variable]
If non-nil, this represents the line number that is to be located after a file is visited by vh() and has gone through buffer completion selection.

`shu-cpp-visit-target` *file-name* [Function]
This is the function that visits the file name chosen by vh() and perhaps by a completing read from a completion buffer.

`shu-default-file-to-seek` [Variable]
The default file to seek that is proposed as a possible file when vh() finds a file name under the cursor, possibly with a line number. If the user chooses a file other than this one, we need to forget the associated line number.

`shu-find-default-cpp-name` [Function]

Find a default file name to visit. Calls shu-find-line-and-file to find a possible file name and possible line number within the file. Return the file name if one is found and sets shu-cpp-target-file-line to the line number if one is found

`shu-find-line-and-file` [Function]

If point is sitting on the word "line", then look for a string of the form "line 678 of frobnitz.cpp" and return a list whose first item is the file name and whose second item is the line number. If point is not sitting on the word "line", then check to see if point is sitting on a string that has the syntax of a valid file name. If that is the case, remember the file name. If the file name is followed by a colon, look for a line number following the colon. If found, look for another colon followed by a possible column number. This function will return nil if none of the above are found. If only a file name is found, return a list with one entry. If file name and line number, a list with two entries. If file name, line number, and column number, a list with three entries.

`shu-get-line-column-of-file` [Function]

Fetch the potential line number and column number within a file. On entry, point is positioned at the character following a file name. This file name may be followed by a line number and the line number may be followed by a column number. This function recognizes four forms of line and column specifications.

thing.cpp:1234:42

indicates the file thing.cpp line number 1234, column 42

[file=thing.cpp] [line=1234]

indicates the file thing.cpp line number 1234.

"thing.cpp", line 55.16:

indicates the file thing.cpp line number 55, column 16.

"thing.cpp", line 55:

indicates the file thing.cpp line number 55.

The purpose of this function is only to gather the line and column specification following the file name. The return value is a list, which is empty if no line or column number was found. It has only one element, which is the line number if only a line number was found. It has two elements, which are the line number and column number if both line number and column number were found.

This should probably be turned into a hook at some point so that other line and column number indications may be used.

`shu-get-real-this-command-name` [Function]
Return the symbol name of the variable "real-this-command" if it is defined. If not defined, return the string "{**unknown**}". Some older versions of emacs do not support real-this-command.

`shu-global-operation` *documentation* [Function]
&optional *search-target*
Invoke a function on every file in the project. documentation is the string to put in the buffer to describe the operation.

`shu-hother` [Command]
(Alias: hother)
Visit a .h file from the corresponding .cpp or t.cpp file. If visiting a .cpp or t.cpp file, invoke this function and you will be taken to the corresponding .h file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`shu-internal-list-c-project` *proj-list* [Function]
Insert into the current buffer the names of all of the code files in the project whose files are in *proj-list*.

`shu-internal-set-c-project` *start end* [Function]
Mark a region in a file that contains one subdirectory name per line. Then invoke set-c-project and it will find and remember all of the c and h files in those subdirectories. You may then subsequently visit any of those files by invoking M-x vh which will allow you to type in the file name only (with auto completion) and will then visit the file in the appropriate subdirectory.

`shu-internal-visit-project-file` *look-for-target* [Function]
Visit a c or h file in a project.

`shu-internal-which-c-project` *pbuf* [Function]
Undocumented

`shu-list-c-directories` [Command]
(Alias: list-c-directories)
Insert into the current buffer the names of all of the directories in a project.

`shu-list-c-prefixes` [Command]

(Alias: list-c-prefixes)

List all of the file prefixes found in the current project, if any. See the docstring for *shu-project-split-file-name* for further information about extracted file prefixes.

`shu-list-c-project` [Command]

(Alias: list-c-project)

Insert into the current buffer the names of all of the code files in the current project.

`shu-list-in-cpp-directory` *directory-name* [Function]

Insert into the current buffer the names of all of the code files in a directory.

`shu-make-c-project` *proj-root* [Command]

(Alias: make-c-project)

Create a project file of all directories containing c or h files. Starts at the specified root directory and searches all subdirectories for any that contain c or h files. It then inserts all of the directory names into the current file at point.

`shu-on-the-word-line` [Function]

Return the character position of the start of the current word if point is sitting anywhere on the word "line". This is used pick up file positions of the form: "line 628 of frobnitz.cpp"

`shu-other` [Command]

(Alias: other)

Visit an h file from a c file or a c file from an h file If visiting a .h file, invoke this function and you will be taken to the .c or .cpp file. If visiting a .c or .cpp file, invoke this function and you will be taken to the corresponding .h file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`shu-possible-cpp-file-name` [Function]

Return a list containing a possible file name with a possible line number and a possible column number. If the thing on point does not resemble a file name, return nil. If it looks like a file name, save it and call shu-get-line-column-of-file to perhaps harvest a line number and column number within the file. The return result is a list of length one if there is only a file name, a list of length two if there is a file name and line number, a list of length three if there is a file name, line number, and column number.

`shu-project-cpp-buffer-name` [Constant]

The name of the buffer into which messages are placed as c and h files are being scanned.

`shu-project-file-list` [Variable]

This is a list of the full path and name of every file in the project. It is used when a global change needs to visit every file in the project.

`shu-project-get-file-info` *plist file-name* [Macro]

Extract the file information from one entry in shu-cpp-class-list.

`shu-project-make-short-key-list` *key-list* [Function]

key-list is an alist in which the car of each item is the unqualified file name and the cdr of each item is the fully qualified file name, including the path to the file. This function creates two lists. One is an alist of all of the file prefixes. That car of each item is the prefix. The cdr of each item is the number of times that prefix was found. The second is a list similar to *key-list* with all of the file names changed to their equivalent short names. If the long and short names are the same, then that item is omitted from the new list of short names.

Return is a cons cell whose car is the prefix list and whose cdr is the short name list.

`shu-project-split-file-name` *file-name* [Function]

Split *file-name* into two parts. The first part is the prefix and the second part is the short name. The rules for splitting are as follows:

If the name has no underscores, then the prefix is empty and the short name is the whole name.

If the name has one underscore in it (e.g., "abcdef_mumble.cpp"), then the prefix is the part before the underscore ("abcdef") and the short name is all of the rest ("mumble.cpp").

If the name has more than one underscore in it (e.g., "x_abcdef_mumble.cpp"), then we look as the length of the first part ("x"). If its length is one, then the prefix is the concatenation of the first two parts ("x_abcdef"), and the short name is the rest ("mumble.cpp"). If the length of the first part is not one (e.g., file name is "lovely_looking_mumble.cpp"), then the prefix is the first part ("lovely") and the short name is the rest ("looking_mumble.cpp").

After the split, the short name is converted to all lower case.

Return a cons cell of the form (prefix . short-name)

`shu-project-user-class-count` [Variable]
Undocumented

`shu-renew-c-project` [Command]
(Alias: renew-c-project)
Renew a previously established project to pick up any new files.

`shu-set-c-project` *start end* [Command]
(Alias: set-c-project)
Mark a region in a file that contains one subdirectory name per line. Then invoke set-c-project and it will find and remember all of the c and h files in those subdirectories. You may then subsequently visit any of those files by invoking M-x vh which will allow you to type in the file name only (with auto completion) and will then visit the file in the appropriate subdirectory. If this function is called interactively, it clears the project name that was established by either *shu-setup-project-and-tags* of *shu-visit-project-and-tags*.

`shu-set-dir-prefix` *prefix* [Command]
(Alias: set-dir-prefix)
Set the default file name prefix to be the current directory name end for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`shu-set-prefix` *prefix* [Command]
(Alias: set-prefix)
Set the default file name prefix for those times when we are trying to visit a project file and point is not sitting on something that resembles a file name.

`shu-setup-project-and-tags` *proj-dir* [Function]
Visit a project file, make a C project from the contents of the whole file, create a file called "files.txt" with the name of every file found, invoke ctags on that file to build a new tags file, and then visit the tags file. *proj-dir* is the name of the directory in which the project file exists and in which the tags file is to be built.

`shu-tother` [Command]
(Alias: tother)
Visit a t.cpp file from the corresponding .cpp or .h file. If visiting a .c or .cpp file, invoke this function and you will be taken to the corresponding .t.cpp

file. This function will use a project if one is active. Otherwise, it will assume that all files reside in the same directory.

`shu-vh` [Command]

Visit a c or h file in a project. If point is on something that resembles a file name, then visit that file. If the file name is followed by a colon and a number then go to that line in the file. If the line number is followed by a colon and a number then use the second number as the column number within the line.

`shu-visit-project-and-tags` *proj-dir* [Function]

Visit a project file, make a C project from the contents of the whole file, and load that tags table from the tags file in the specified directory. This function uses the existing tags table, whereas *shu-setup-project-and-tags* creates a new tags table.

`shu-vj` [Command]

Visit a c or h file in a project. Ignore any text that point is on and visit the file typed in the completion buffer.

`shu-which-c-project` [Command]

(Alias: which-c-project)

Identify the current project by putting into a project buffer the name of the file from which the project was derived as well as the name of all of the directories in the project. Then switch to that buffer. The idea is to invoke this function, look at the results in that buffer, and then quit out of the buffer.

10 shu-cpp-token

Functions to parse a region of C++ code and return a list of tokens found therein. The returned list is a list of token-info, whose structure is shown below.

The two top level functions in this file are shu-cpp-tokenize-region and shu-cpp-reverse-tokenize-region. The former returns a list of tokens with the first token in the list being the first token found. The latter function returns the reverse of the former.

The tokenized lists are used by the functions in shu-cpp-match.el and shu-match.el to find and retrieve patters in the token lists.

10.1 List of functions by alias name

A list of aliases and associated function names.

`parse-region` *start end* [Command]
(Function: shu-cpp-parse-region)

Parse the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying the result in the Shu unit test buffer.

`reverse-parse-region` *start end* [Command]
(Function: shu-cpp-reverse-parse-region)

Reverse parse the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying the result in the Shu unit test buffer.

10.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-cpp-adjust-template-parameters` *token-list* [Function]

Turn each set of template parameters in a reverse parsed list (anything between “>“ and “<“ into a separate token of type *shu-cpp-token-type-tp*. e.g., the five separate tokens “>“, “double”, “,”, “int”, “<“ will be turned into one new token of type *shu-cpp-token-type-tp* whose token value is “int, double”.

`shu-cpp-compare-tlist-sans-comment` *token-list1* [Function]

Compare the two lists of TOKEN-INFO skipping comments and stopping at the end of the shortest one. The purpose of this function is to determine if two bits of reverse parsed code have the same suffix.

`shu-cpp-compare-token-info` *token-info1 token-info2* [Function]
Compare the two instances of TOKEN-INFO, returning true if their contents are the same.

`shu-cpp-compare-token-info-sans-pos` *token-info1* [Function]

Compare the two instances of TOKEN-INFO, returning true if their contents are the same. Do not include the start or end points in the comparison.

`shu-cpp-copy-token-info` *token-info* [Function]
Return a deep copy of the given *token-info*.

`shu-cpp-get-comment` *start end* [Function]
Get the comment that starts at point. If it starts with //, get to end of line. If it starts with /{*,} skip to terminating {*/.} If there is no terminating {*/} in the region, create a TOKEN-INFO with the appropriate error message in it.

`shu-cpp-get-operator-token` *length* [Function]
Fetch the C++ operator that starts at point. *length* is the number of characters in the operator, which is either 1, 2, or 3.

`shu-cpp-get-quoted-token` *start end* [Function]
Find the token in the buffer between *start* and *end* that is terminated by an unescaped quote. On entry, point must be positioned on the quote that starts the string. The appropriate error message is returned if there is no unescaped quote before the end of the current line. If the character under point is not a quote start character, nil is returned.

`shu-cpp-get-unquoted-token` *start end* [Function]
Find the unquoted token in the buffer that starts at point. The token is terminated either by the position of *end* or by the regular expression that defines the end of an unquoted token.

`shu-cpp-is-reverse-token-list-balanced` *token-list* [Function]
close-char
Return t if a token-list contains matched pairs of *open-char* and *close-char*. If imbalance is present, print error message and return nil. Typically *open-char* might be a left parenthesis and *close-char* might be a right parenthesis. Or they might be "<" and ">", or any other pair types. Note that this function returns t if there are no occurrences of *open-char* and *close-char*

`shu-cpp-keywords` [Constant]
alist of C++ key words up to approximately C++17

`shu-cpp-keywords-hash` [Variable]
The hash table of C++ key words

`shu-cpp-make-token-info` *token token-type spoint* [Function]
&optional *error-message*
Pack the supplied arguments into a TOKEN-INFO and return the TOKEN-INFO.

`shu-cpp-operator-start` [Constant]
Define the set of characters that start C++ operators

`shu-cpp-operator-start-chars` [Constant]
Define the set of characters that start C++ operators

`shu-cpp-operators-one` [Constant]
Define the set of one character operators. Note that we include ; as an operator, even though, strictly speaking, it is not an operator.

`shu-cpp-operators-three` [Constant]
Define the set of three character C++ operators

`shu-cpp-operators-two` [Constant]
Define the set of two character C++ operators

`shu-cpp-parse-region` *start end* [Command]
(Alias: parse-region)
Parse the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying the result in the Shu unit test buffer.

`shu-cpp-remove-template-parameters` *token-list* [Function]
preserve-template
Remove from the token-list any template parameters (anything between "<" and its matching ">"). In addition, adjust the end point of the token immediately prior to the template parameter to be that of the endpoint of the template parameter. Thus something like the following:

```
Mumble<int, double>
```

becomes the token "Mumble" with a length of 19. If *preserve-template* is

true, then we change the token that contains the type name by copying the template parameters into it. If the type name token was "Mumble", then the token itself is changed to "Mumble<int, double>". The tokens that represent the template parameters are removed from the token list in either case. This eliminates any comma that does not immediately follow a parameter name. As we scan the reverse ordered token list, any comma that we find immediately precedes a variable name in the parameter list. There may be intervening operators and comments. But once we find a comma, the next unquoted token is the variable name.

`shu-cpp-replace-token-info` *token-info token* [Function]
spoint epoint **&optional**

Replace the supplied arguments in the given *token-info* and return the *token-info*.

`shu-cpp-reverse-parse-region` *start end* [Command]
(Alias: reverse-parse-region)

Reverse parse the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying the result in the Shu unit test buffer.

`shu-cpp-reverse-tokenize-region` *start end* [Function]
limit

Scan the region between *start* and AND to build a list of tokens that represent the C++ code in the region. Return a cons cell with two items in it. The car of the cons cell is a token-info that represents a parse error. The cdr of the cons cell is the list of tokens. This list is incomplete if the car of the cons sell is not nil. The optional *limit* argument is used to bound the scan as follows. When we have added to the list the first token that is beyond the point specified by *limit*, we stop the scan.

`shu-cpp-reverse-tokenize-region-for-command` *start* [Function]
&optional

Reverse tokenize the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying any error message, if there is one. If no error, return the token list, else return nil

`shu-cpp-token-delimiter-chars` [Constant]

List of all of the characters that terminate an unquoted C++ token

`shu-cpp-token-delimiter-end` [Constant]

Regular expression to define that which terminates an unquoted token in

C++

`shu-cpp-token-extract-epoint` *token-info* [Function]
Return the end point from an instance of token-info.

`shu-cpp-token-extract-info` *token-info token spoint epoint* [Macro]
Extract the information out of a token-info

`shu-cpp-token-extract-spoint` *token-info* [Function]
Return the start point from an instance of token-info.

`shu-cpp-token-extract-token` *token-info* [Function]
Return the token from an instance of token-info.

`shu-cpp-token-extract-type` *token-info* [Function]
Return the token type from an instance of token-info.

`shu-cpp-token-find-spanning-info-token` *token-list* [Function]

Find the token-info in *token-list* that spans *here-point*, if any. If there is no such token-info return nil. If there is such a token-info, return a cons cell whose car is the spanning token-info and whose cdr is a pointer to the next token-info in the tlist.

`shu-cpp-token-first-non-comment` *tlist* [Function]
tlist points to a list of token-info. Return *tlist* pointing to the next token-info that does not hold a comment. If you are scanning through a list of tokens, it is not uncommon to want to skip all of the comments. Use this at the bottom of the loop in place of the usual "setq tlist (cdr tlist))".

i.e.,

```
(while tlist
   ...
  (setq tlist (cdr tlist)))
```

becomes

```
(setq tlist (shu-cpp-token-first-non-comment tlist))
(while tlist
   ...
```

```
(setq tlist (shu-cpp-token-first-non-comment tlist)))
```

and you will scan through the list without seeing any comments.

`shu-cpp-token-info-replace-epoint` *token-info* [Function]

Replace the EPOINT of *token-info* with *new-epoint*

`shu-cpp-token-info-replace-token` *token-info* [Function]

Replace the TOKEN of *token-info* with *new-token*, returning the modified *token-info*

`shu-cpp-token-internal-parse-region` *func start end* [Function]
Internal function to do a forward or reverse parse of the region between *start* and *end*. *func* holds the function to be invoked to do the parse. This would be either *shu-cpp-tokenize-region* or *shu-cpp-reverse-tokenize-region*. Once the parse is complete, the token list is shown in the Shu unit test buffer. If any error is detected, it is displayed at the point at which the error was detected.

`shu-cpp-token-internal-tokenize-region-for-command` *func end* [Function]
Internal function to do a forward or reverse parse of the region between *start* and *end*. *func* holds the function to be invoked to do the parse. This would be either shu-cpp-tokenize-region or shu-cpp-reverse-tokenize-region. Once the parse is complete, we check to see if an error was detected. If an error was detected we go to the error point and show the error. Then we return nil to the caller. If no error was detected, we return the token-list to the caller. This is a convenient way for a command to get the token-list and not have to do anything to display an error message if an error is encountered. The command calls this function and simply exits if nil is returned, knowing that the error message has already been displayed.

`shu-cpp-token-is-comment` *token-info* [Function]
Return true if the token-info represents a comment.

`shu-cpp-token-next-non-comment` *tlist* [Function]
tlist points to a list of token-info. Return *tlist* pointing to the next token-info that does not hold a comment. If you are scanning through a list of tokens, it is not uncommon to want to skip all of the comments. Use this at the bottom

of the loop in place of the usual "setq tlist (cdr tlist))".

i.e.,

```
(while tlist
   ...
  (setq tlist (cdr tlist)))
```

becomes

```
(while tlist
   ...
  (setq tlist (shu-cpp-token-next-non-comment tlist)))
```

and you will scan through the list without seeing any comments.

`shu-cpp-token-set-alias` [Function]
Set the common alias names for the functions in shu-cpp-token. These are usually the same as the function names with the leading shu- prefix removed.

`shu-cpp-token-show-token-info` *token-info* **&optional** [Function]

Show the data returned by one of the functions in this file that scans for tokens.

`shu-cpp-token-show-token-info-buffer` *token-info gb title* [Function]
Show the data returned by one of the functions in this file that scans for tokens.

`shu-cpp-token-string-token-info` *token-info* [Command]
Return a string that represents the contents of the token-info.

`shu-cpp-token-token-type-name` *token-type* [Function]
Return the name of a token type.

`shu-cpp-token-type-cc` [Constant]
Token type that indicates a line in which the first non-blank item is a comment that starts in a column greater than or equal to the column defined by shu-cpp-comment-start. This is known as a code comment with no code present.

`shu-cpp-token-type-ct` [Constant]

Token type that indicates a comment

`shu-cpp-token-type-kw` [Constant]
Token type that indicates a C++ key word

`shu-cpp-token-type-op` [Constant]
Token type that indicates an operator

`shu-cpp-token-type-qt` [Constant]
Token type that indicates a quoted string

`shu-cpp-token-type-tp` [Constant]
Token type that indicates a template parameter. The standard parsing does nothing with template parameters. Something like "<int>" is simply turned into three separate tokens, "<", "int", and ">" (or ">", "int", and "<" in a reverse parse). But some of the other transform functions will turn this list of tokens into the single template parameter "int"

`shu-cpp-token-type-uq` [Constant]
Token type that indicates an unquoted token

`shu-cpp-tokenize-region` *start end* **&optional** *limit* [Function]
Scan the region between *start* and AND to build a list of tokens that represent the C++ code in the region. Return a cons cell with two items in it. The car of the cons cell is a token-info that represents a parse error. The cdr of the cons cell is the list of tokens. This list is incomplete if the car of the cons cell is not nil. The optional *limit* argument is used to bound the scan as follows. When we have added to the list the first token that is beyond the point specified by *limit*, we stop the scan.

`shu-cpp-tokenize-region-for-command` *start end limit* [Function]
Tokenize the region between *start* and *end* into a list of all of the C++ tokens contained therein, displaying any error message, if there is one. If no error, return the token list, else return nil

`shu-cpp-tokenize-show-list` *token-list* **&optional** [Function]

Undocumented

`shu-cpp-tokenize-show-list-buffer` *token-list gb title* [Function]

Undocumented

`shu-get-cpp-keywords-hash` [Command]

Return a hash table containing all of the C++ key words.

11 shu-keyring

This is a set of functions for maintaining and querying a keyring of names, URLs, users IDs, passwords, and related information that are maintained in an external keyring file.

Functions allow you to find a keyring entry by name and to put one piece of its information, such as user ID or password, in the clip board, from which it may be pasted into a browser or other application.

The keyring file may be encrypted with GPG. As of emacs 23, the EasyPG package is included with the emacs distribution. When you tell emacs to open a file that has been encrypted with GPG, you are prompted for the passphrase and the file is decrypted into memory.

The file keyring.txt in the usr directory is am example of a small keyring file that has not been encrypted. Each entry in the file consists of a set of name value pairs. Each value may be enclosed in quotes and must be enclosed in quotes if it contains embedded blanks.

A single set of name value pairs starts with an opening "<" and is terminated by a closing "/>".

Here is an example of a set of name value pairs:

```
< name="Fred email" url=mail.google.com  id=freddy@gmail.com  pw=secret />
```

The names may be arbitrary but there are six names that are recognized by the functions in this package. They are:

acct represents an account number

id represents a user ID

name represents the name of the entry. This is the key that is used to find the entry. If no name is given, then the name of the URL is used. If the URL starts with "www.", the "www." is removed to form the name. An entry that has no name and a URL of "www.facebook.com" would have an auto generated name of "facebook.com".

pin represents a pin number

pw represents a password

url represents a URL

To use a keying file, place the following lines in your .emacs file:

```
(load-file "/Users/fred/.emacs.d/shu-base.elc")
(load-file "/Users/fred/.emacs.d/shu-nvplist.elc")
(load-file "/Users/fred/.emacs.d/shu-keyring.elc")
(shu-keyring-set-alias)
(setq shu-keyring-file "/Users/fred/shu/usr/keyring.txt")
```

replacing "/Users/fred/shu/usr/keyring.txt" with the path to your keyring file.

All of the shu functions require shu-base.

If using the sample keyring file, Fred can now use this to log onto his gmail account as follows.

Type M-x krurl. This prompts for the name of the desired key. Type "Fred em" and hit TAB to complete. This fills out the name as "Fred email" and puts the URL "mail.google.com" into the clip board. Open a browser and paste the URL into it to go to gmail. At gmail, select login. In emacs type M-x krid. When prompted for the key, use the up arrow to retrieve the last key used, which will be "Fred email". This puts "freddy@gmail.com" into the clip board for conveniently pasting into the gmail widow. To obtain the password, type M-x krpw. This puts the password into the clip board from which it may be pasted into the gmail widow.

11.1 List of functions by alias name

A list of aliases and associated function names.

`kracct` [Command]
(Function: shu-keyring-get-acct)

Find the account for an entry in the keyring file. This displays the entry in the message area and puts the password into the kill ring so that it can be yanked or pasted into the application requesting it.

`krfn` [Command]
(Function: shu-keyring-get-file)

Display the name of the keyring file, if any. This is useful if you are getting unexpected results from some of the query functions that look up keyring information. Perhaps the unexpected results come from the fact that you are using the wrong keyring file.

`krid` [Command]
(Function: shu-keyring-get-id)

Find the User Id for an entry in the keyring file. This displays the entry in the message area and puts the user Id into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`krpin` [Command]
(Function: shu-keyring-get-pin)

Find the pin for an entry in the keyring file. This displays the entry in the message area and puts the pin into the kill ring so that it can be yanked into

a buffer or pasted into the application requesting it.

`krpw` [Command]
(Function: shu-keyring-get-pw)
Find the password for an entry in the keyring file. This displays the entry (without the password) in the message area and puts the password into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`krurl` [Command]
(Function: shu-keyring-get-url)
Find the url for an entry in the keyring file. This displays the entry in the message area and puts the url into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`krvf` [Command]
(Function: shu-keyring-verify-file)
Parse and verify the keyring file, displaying the result of the operation in the keyring buffer ({**shu-keyring**}). If one of the queries for a url or other piece of information is unable to find the requested information, it could be that you have the wrong keyring file or that there is a syntax error in the keyring file. shu-keyring-get-file (alias krfn) displays the name of the keyring file. This function parses the keyring file. After the operation. look into the keyring buffer ({**shu-keyring**}) to see if there are any complaints about syntax errors in the file.

11.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-keyring-account-name` [Constant]
Key word that denotes a name.

`shu-keyring-add-values-to-index` *index vlist item* [Function]
Add a set of keys *vlist* to *index* for *item*. Keys within the item are filtered for duplicates. But this does not prevent two different items from sharing the same key, although it would be unusual in a keyring.

`shu-keyring-buffer-name` [Constant]
The name of the buffer into which keyring diagnostics and messages are recorded.

`shu-keyring-clear-index` [Function]

This is called from after-save-hook to clear the keyring index if the keyring file is saved. The keyring index is built the first time it is needed and kept in memory thereafter. But we must refresh the index if the keyring file is modified. The easiest way to do this is to clear the index when the keyring file is modified. The next time the index is needed it will be recreated.

`shu-keyring-file` [Custom]

Text file in which urls, names, and passwords are stored.

`shu-keyring-find-index-duplicates` *index* [Function]

Find any duplicates in the keyring index. When the index is built we filter duplicate keys for the same item. But there could be two different items with the same key. This function returns TRUE if two or more items have the same key. The index must be in sorted order by key value before this function is called.

`shu-keyring-get-acct` [Command]

(Alias: kracct)

Find the account for an entry in the keyring file. This displays the entry in the message area and puts the password into the kill ring so that it can be yanked or pasted into the application requesting it.

`shu-keyring-get-field` *name* [Function]

Fetch the value of a named field from the keyring. Prompt the user with a completing-read for the field that identifies the key. Use the key to find the item. Find the value of the named key value pair within the item. Put the value in the kill-ring and also return it to the caller.

`shu-keyring-get-file` [Command]

(Alias: krfn)

Display the name of the keyring file, if any. This is useful if you are getting unexpected results from some of the query functions that look up keyring information. Perhaps the unexpected results come from the fact that you are using the wrong keyring file.

`shu-keyring-get-id` [Command]

(Alias: krid)

Find the User Id for an entry in the keyring file. This displays the entry in the message area and puts the user Id into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`shu-keyring-get-pin` [Command]
(Alias: krpin)

Find the pin for an entry in the keyring file. This displays the entry in the message area and puts the pin into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`shu-keyring-get-pw` [Command]
(Alias: krpw)

Find the password for an entry in the keyring file. This displays the entry (without the password) in the message area and puts the password into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`shu-keyring-get-url` [Command]
(Alias: krurl)

Find the url for an entry in the keyring file. This displays the entry in the message area and puts the url into the kill ring so that it can be yanked into a buffer or pasted into the application requesting it.

`shu-keyring-history` [Variable]

The history list used by completing-read when asking the user for a key to an entry in the keyring file.

`shu-keyring-id-name` [Constant]

Key word that denotes a user ID.

`shu-keyring-in-index` *index item value* [Function]

Return true if the *index* already contains the *value* for this *item*.

`shu-keyring-index` [Variable]

The variable that points to the in-memory keyring index.

`shu-keyring-name-name` [Constant]

Key word that denotes a name.

`shu-keyring-parse-keyring-file` [Command]

Parse the keyring file and create the in-memory index if the keyring file contains no duplicate keys.

`shu-keyring-pin-name` [Constant]

Key word that denotes a PIN.

`shu-keyring-pw-name` [Constant]

Key word that denotes a password.

`shu-keyring-set-alias` [Function]

Set the common alias names for the functions in shu-keyring. These are generally the same as the function names with the leading shu- prefix removed. But in this case the names are drastically shortened to make them easier to type.

`shu-keyring-show-index` *index* [Function]

Print the keyring index

`shu-keyring-show-name-url` *type item* [Function]

Show in the message area the name, url, or both of a keyring entry. Also prefix the message with the upper case type, which is the type of the entry that has been placed in the clipboard, (PW, ID, etc.)

`shu-keyring-update-index` *index item* [Function]

Extract the keys from a keyring item and add them to the keyring index.

`shu-keyring-url-name` [Constant]

Key word that denotes a URL.

`shu-keyring-values-to-string` *values* [Function]

Turn a list of values into a single string of values separated by slashes.

`shu-keyring-verify-file` [Command]

(Alias: krvf)

Parse and verify the keyring file, displaying the result of the operation in the keyring buffer ({**shu-keyring**}). If one of the queries for a url or other piece of information is unable to find the requested information, it could be that you have the wrong keyring file or that there is a syntax error in the keyring file. shu-keyring-get-file (alias krfn) displays the name of the keyring file. This function parses the keyring file. After the operation. look into the keyring buffer ({**shu-keyring**}) to see if there are any complaints about syntax errors in the file.

12 shu-match

Functions that use functions in shu-cpp-match.el

12.1 List of functions by alias name

A list of aliases and associated function names.

`find-all-variables` [Command]
(Function: shu-match-find-variables)

Find what might be all of the variable declarations in a header file by doing a reverse tokenized scan looking for all occurrences of operator ";" followed by something that matches the regular expression for a C++ name. Then take each line that matches and put it in the buffer "{**shu-vars**}".

12.2 List of functions and variables

List of functions and variable definitions in this package.

`remove-class-duplicates` *proc-classes log-buf* [Function]

proc-classes is the alist of classes that we will process. The car of each item is the containing namespace. The cdr of each item is the list of class names contained within the namespace. The original class list may have had duplicate class names within a given namespace. We may also have added class names to a given namespace from processing one or more "using name" statements.

For example, if the lass list contained "std . set map string" and we also processed a "using std::string" statement, the code that processed that statement would have blindly added "string" to the list of classes in the namespace "std". The list of classes for namespace "std" would then contain "string set map string".

This function removes any duplicate class names within a given namespace. This is necessary because we are about to invert the class list to produce a hash table in which the key is the class name and the value is the enclosing namespace name. This operation will fail if a given namespace contains duplicate class names.

`shu-cpp-match-colon-name` [Constant]

A repeating side list to match zero or more instances of {:: <name>}

`shu-cpp-match-many-using-list` [Constant]

These two lists match what may follow the key word "using". The first list matches the key word "namespace" followed by any of the different name types that may follow "using namespace". The second list matches any of the name forms that may following the key word "using" when it is not followed by the key word "namespace".

`shu-cpp-match-namespace-forms` [Constant]
;

`shu-cpp-match-namespace-list` [Constant]
namespace

`shu-cpp-match-namespace-list-single` [Constant]
namespace

`shu-cpp-match-some-include` [Constant]
A list of match-info that matches "#include <name>".

`shu-cpp-match-using-forms` [Constant]
These two lists match the form of name that can follow a "using" directive that is not a "using namespace" directive. This is either <name> or <name>::<name>>, <name>::<name>::<name>, etc. The first list above matches <name> followed by semicolon.. The second list matches <name> followed by a looping side list for zero or more occurrences of "::" followed by <name>

`shu-cpp-match-using-list-single` [Constant]
This is a single list that is the top level list for matching anything that may follow the key word "using".

`shu-cpp-rmv-using` *class-list* **&optional** *top-name* [Function]
Remove "using namespace" directives from a C++ file, adding the appropriate namespace qualifier to all of the unqualified class names. *class-list* is an a-list in which the car of each entry is a namespace and the cdr of each entry is a list of class names. Here is an example of such an a-list:

```
(list
 (cons ``std''    (list ``set'' ``string'' ``vector''))
 (cons ``world''  (list ``Hello'' ``Goodbye'')))
```

top-name, if present is a higher level namespace. Given a top level namespace of "WhammoCorp", then the following line:

```
using namespace WhammoCorp::world;
```

would be interpreted as though it had been written:

```
using namespace world;
```

`shu-match-add-names-to-class-list` *un-list* [Function]
proc-rlists **&optional**

un-list is the list of rlists that represent the "using name" statements. *proc-classes* is the class list we will be using to do the processing. *proc-rlists* is the set of rlists that represents the "using namespace" statements. This function adds the"using name" directives, if any, to both *proc-classes* and *proc-rlists*. It returns a cons cell in which the car is the modified *proc-classes* and the cdr is the modified *proc-rlists*.

`shu-match-erase-using` *proc-rlists log-buf* [Command]
proc-rlists is the set of rlists we are processing that represent all of the "using namespace" and "using name" statements. This function replaces all of those statements in the buffer with whitespace. This is done in order to preserve the positions of all other items in the buffer.

`shu-match-fetch-include-hash-table` *token-list* [Function]

token-list is the list of tokenized text from the buffer. *class-ht* is the hash table that holds as its keys the names of all of the classes that we will process.

This function finds all of the names in #include statements whose included file name matches a class name in *class-ht*. It then builds and returns a new hash table in which the key is the name of an included file whose name matches a class name and whose value is a list of the spoints of the included file names.

It is a list of spoints, as opposed to a single point, because an include statement with a given file name may appear several times.

For example, in the following code:

```
#include <set>
#include <map>
#
```

```
 include
      <set>

using namespace std;

set     x;
map     y;
```

the member variables x and y should be changed to std::set and std::map respectively, but none of the occurrences of set or map in the include statements should be changed.

`shu-match-find-all-some-include` *token-list* [Function]
Given a token list, return a list of tokens that represent all of the simple names found in #include < name >, where "name" is a C++ name. This search will neither find nor return a name with a . in it. This is a limited search designed to find names that might be mistaken for class names to be qualified.

For example, if we are removing the namespace "std", then one of the names we may wish to qualify is "set". Buf if we encounter "#include <set>", we do not want to transform that into "#include <std::set>".

Names of include files delimited by quotes will not be seen in the scan because those are inside strings. So we only want to find names in include statements that are delimited by angle brackets and do not include a . in them.

`shu-match-find-all-using-internal` *token-list* [Function]
Given a token list, return two different lists. The first is a list of all "using namespace" statements. The second is a list of all "using" statements that are not "using namespace" statements. "using namespace std;" is an example of the first type. "using std::string" is an example of the second type. The return value of this function is a single cons cell in which the cdr points to the first list and the car points to the second list. If neither list is present, then the return value is nil.

`shu-match-find-semi-names` *token-list* [Function]
With a match list that is a semi-colon followed by the regular expression for a C++ name, do a reverse tokenized match for all occurrences, then take each line that holds a match and put it into the buffer "{**shu-vars**}",

`shu-match-find-unqualified-class-names` *class-ht* [Command]

token-list *lo*

buf

Go through all of the tokens looking at any unquoted token that is in the hash table of unqualified class names. When an instance of a class name is found, check to see it it is preceded by "::", ".", or "->". "::" indicates that it is probably qualified. "." or "->" indicate that it is probably a function name.

Check also to see if it is followed by ")" or "[", which probably indicates that it is a variable name.

Next, check to see if it is wrapped in an #include statement.

If it survives all of those checks, it is probably an unqualified class name, in which case its token-info is pushed onto a list. The list is one of the values returned from this function. Since each token-info is pushed onto the list, the list is returned in reverse order. i.e., the last token in the file is the first in the list.

At this point it is possible to visit each token in the list, which is in reverse order in the file, look up each token, and insert in front of it its qualifying namespace.

The other return value from this function is the count of the number of unquoted tokens that were looked up in the hash table of all of the class names, *class-ht.*.

The actual return value from this function is a cons cell whose car is the symbol search count and whose cdr is the list of tokens that represent unqualified class names to be qualified.

`shu-match-find-variables` [Command]

(Alias: find-all-variables)

Find what might be all of the variable declarations in a header file by doing a reverse tokenized scan looking for all occurrences of operator ";" followed by something that matches the regular expression for a C++ name. Then take each line that matches and put it in the buffer "{**shu-vars**}".

`shu-match-get-start-end-pos` *rlist* **&optional** [Function]

Given an *rlist* return the beginning and end positions. The beginning position is the position of the first character of the first token. The end position is the position of the last character of the last token. These two are returned as a cons cell whose car is the beginning position and whose cdr is the end

position. If the optional *whole-lines* is true, the start position is that of the beginning of the line on which the start falls and the end position is that of the end of the line on which the end falls.

`shu-match-increment-class-count` *alist class-name* [Command]

alist is an alist whose key is a *class-name* and whose cdr is a count of the number of times that class name has been found. This function increments the count by one.

`shu-match-internal-rmv-using` *class-list log-buf top-name* [Function]

This is an overview of the entire process used to remove both the using namespace statements (e.g., "using namespace std;") and the using statements (e.g., "using std::string;").

The input is a class list which is an alist in which the key for each entry is a namespace name and the value for each entry is a list of class names that are qualified by the namespace name. This is an example of a class list:

```
(list (cons ‘‘std’’ (list ‘‘set’’ ‘‘string’’ ‘‘vector’’)) (cons ‘‘world’’
 (list ‘‘Hello’’ ‘‘Goodbye’’)))
```

The first step is to tokenize the entire buffer and then use match functions to find each instance of "using namespace" and each occurrence of "using name". Each of these statements is represented by a list of token-info.

If any "using namespace" statements are found, they are merged with the class list to form a new class list that contains only those namespaces for which a "using namespace" statement was found in the buffer.

A separate list is kept of the "using namespace" statements that have no corresponding entries in the class list. This is printed out later as a diagnostic message.

The next step is to merge in the namespaces from the "using name" statements. Each "using name" statement contributes one namespace name and one class name.

The original class list might have contained duplicate class name instances within a given namespace. The merging in the of the "using name" statements may also have created duplicate class names within a namespace, so the next thing we do is remove any duplicate class names within a given namespace. For example, if the input class list contained "std . string set map" and the buffer contains both "using namespace std;" and "using std::string;", the

newly merged class list will contain the class name “string” twice under the namespace “std”.

Once we have the updated class list with duplicates removed, we create two new data structures. One is a hash table in which the key is a class name and the value is the name of the namespace that qualifies that class name. This will be used to determine if an unquoted token is an unqualified class name. The other is an alist in which the key is a class name and the value is zero. This will be used to count the replacement count for each class.

In creating the hash table, we may discover that one class name maps to more than one namespace name. If that happens there is an unresolvable ambiguity and the operation must cease.

The next step is to remove from the token list (from the tokenized buffer), the lists of token-info that represent the “using namespace” and “using name” statements that we are processing. This prevents any subsequent scan from seeing them again.

Next, we erase the “using namespace” statements and “using name” statements from the buffer. We do this by replacing the statements with an equivalent amount of whitespace, which preserves the positions of all of the other tokens in the buffer.

Some of the class names in the class list may also appear in #include statements in the buffer. For example, if we are trying to remove “using namespace std;”, the buffer may well contain #include <set> or #include <map>. These instances of set and map are file names. They are not class names that should have the “std” qualifier added to them.

To handle this case we build another hash table. This one contains class names as its key. It is the intersection of class names and names found in include statements. The value of each entry in the hash table is the list of spoints that are the start point for each name within its include statement. It is a list of spoints because the same name may appear in multiple #include statements.

Then we go through the token list. Whenever we encounter an unquoted token, we look it up in the hash table to see if this is a class name that we should qualify. If the token exists in the hash table, we then look at its context to see if it really looks like a class name.

IF the putative class name is preceded by any of “::”, “.”, or “->“, then we assume that it is either a qualified class name or a function name. There are other various checks that can be found in the function shu-match-find-

unqualified-class-names. One of the checks is to see if it matches an instance contained in an #include statement, which is done with the hash of include names described above.

Each time we find an unqualified class name, we push its token-info onto a new list of class names that need to be qualified. Note that we use push so the list is backwards with respect to buffer order. The first item in the list is that last unqualified class name in the buffer.

This means that we can use the list directly to add the namespace qualifier to each unqualified class name. Since we are going through the buffer backwards, adding a qualifier to an unqualified class name does not change the position of any other unqualified class names in the buffer.

While adding namespace qualifiers to all of the unqualified class names, we also accumulate a change count for each class name.

When all of the unqualified class names have been qualified, we display the final change counts in a buffer and emit a message with the sum of all the change counts.

`shu-match-make-class-hash-table-internal` *proc-classes* [Function]

proc-classes is the alist of all of the namespaces and classes that we will process, with the namespace name being the key and a list of class names within the namespace name as the value.

This function builds a hash table that inverts the alist. Each entry in the hash table has a class name as the key with the name of the enclosing namespace as the value. If two class names map to the same enclosing namespace name, then there is an unresolvable ambiguity that must terminate the operation. If that is the case, diagnostic messages are placed into the log buffer and a nil value is returned.

`shu-match-make-count-alist-from-hash` *class-ht* [Command]

Doc string.

`shu-match-make-include-hash-table` *incl-list* [Function]

incl-list is the list of token-info, each of which represents a name found in an include statement. *class-ht* is the hash table whose keys are the names of the classes that we will be searching for.

For each name that appears in both *incl-list* and *class-ht*, create a new entry

in a new hash table whose key is the name of the class that has been found in one or more include statements and whose value is a list of the spoints in which the class name has been found in one or more include statements.

Whenever we find something that appears to be an unqualified class name, we can look in this hash table to see if this occurrence of the name is one that appears in an include statement and avoid adding a namespace qualifier if that is the case.

`shu-match-merge-namespaces-with-class-list` *class-list* *log-buf* *name* [Function]

Merge the *uns-list* with the *class-list*. Return a cons-cell pointing to two lists. The first is the list of classes from the class list that have corresponding "using namespace" directives in the buffer. The second is the lists of rlists that represent each using namespace directive that we will process. The updated class list will be used to identify class names to be qualified and the namespaces with which to qualify them.. The rlists representing the "using namespace" statements will be used to remove the "using namespace" statements from the buffer.

`shu-match-qualify-class-names` *class-ht* *count-alist* *np-rlists* *symbol-count* *log-buf* [Function]

class-ht is the hash table that maps a class name to its containing namespace name. *count-alist* is the alist that counts the number of times each class name has been qualified by its enclosing namespace. *clist* is the list of token-info, each of which represents an unqualified class name. The list is in reverse order, which is important. It means that one can add a qualification to one class name in the list without changing the location of any other class names, which are above the current one in the buffer. *np-rlists* is a list of rlists, each of which represents a "using namespace" statement for which there is no corresponding entry in the class list. There are the "using namespace" statements that we will not be processing..

This function goes to the position of each unqualified class name, finds its containing namespace in the hash table, and inserts the containing namespace followed by "::" in front of the unqualified class name.

After it inserts the qualifying namespace, it increments in *count-alist* the number of times that the class name was explicitly qualified.

`shu-match-remove-proc-rlists` *token-list* [Function]
log-buf

token-list is the original token list. *proc-rlists* is the set of rlists that represents the set of statements we will be processing. This function removes from *token-list*, all of the items that are contained in the rlists in *proc-rlists*. This is because we do not want a subsequent scan of the token list to include any of the items in the statements we are processing.

The return value from this function is a cons cell whose car is the trimmed *token-list* and whose cdr is the sorted *proc-rlists*, which has been sorted by the start position of each rlist.

`shu-match-rmv-might-be-include` *incl-ht token* [Function]

incl-ht is a hash table whose key is a name that was found in an include statement and whose value is a list of all of the spoints of all of the occurrences of the name in include statements. It is a list because the same name may be included multiple times.

If the current token matches one of the names in *incl-ht* and the spoint of the token is a member of the list of spoints in the entry in *incl-ht*, then the current name is enclosed in an include statement and should not have a namespace qualifier added to it.

This function returns true if the name is wrapped in an include statement.

`shu-match-rmv-show-class-count` *count-alist* [Function]
np-rlists ns-lines *symbol-count*

Put into the log buffer the count of class names that were qualified.

`shu-match-set-alias` [Function]
Set the common alias names for the functions in shu-match, These are generally the same as the function names with the leading shu- prefix removed.

`shu-match-using-namespace-string` *rlist* **&optional** [Function]

Given an *rlist* that contains a "using namespace" statement, return the string that is the fully qualified namespace name. If the first part of the name is the optional *top-name*, it is omitted from the final result.

`shu-match-using-string` *rlist* **&optional** *top-name* [Function]
Given an *rlist* that contains a "using" statement (as opposed to "using names-

pace"), return two strings. One is the class name. The other is the fully qualified namespace name. For example, if the statement is "using std::string," the fully qualified namespace name is "std" and the class name is "string". The two strings are returned in a cons cell whose car is the namespace name and whose cdr is the class name.

13 shu-misc

A miscellaneous collection of useful functions

13.1 List of functions by alias name

A list of aliases and associated function names.

`add-prefix` *prefix* [Command]
(Function: shu-add-prefix)

Put a prefix and a space in front of each line in the region. Prompt is issued for the prefix.

`all-quit` [Command]
(Function: shu-all-quit)

Kill all dired buffers and all buffers that contain a file and are unmodified. It is not uncommon to have dozens of buffers open that are unrelated to the current task and this is a convenience function for closing many buffers that do not need to be open.

`buffer-number-lines` [Command]
(Function: shu-buffer-number-lines)

Create a buffer whose name is derived from the file name of the current buffer but with the string "-numbered" added to the name. Thus "foo.cpp" would become "foo-numbered.cpp" Into this new buffer, copy the contents of the current file with each line prefixed with its line number. This is designed for those times when you want to copy snippets of code with the line number in front of each line because you are commenting on code and want the person receiving the comments to sea the line number in front of each line.

`case-insensitive` [Command]
(Function: shu-case-insensitive)

Set the variable case-fold-search to t to make searches and matches ignore case. I can never remember which way to set case-fold-search, hence this simple, little function.

`case-sensitive` [Command]
(Function: shu-case-sensitive)

Set the variable case-fold-search to nil to make searches and matches respect case. I can never remember which way to set case-fold-search, hence this simple, little function.

`comma-names-to-letter` [Command]
(Function: shu-comma-names-to-letter)

In a list of names, change all occurrences of Lastname, Firstname to an empty Latex letter. Position to the start of the file and invoke once.

`de-star` [Command]
(Function: shu-de-star)

Remove leading spaces and asterisk from each line in the region. This is useful for editing doxygen comments of the form:

/*!

```
* This is some commentary.
* This is more commentary, etc.
\emph{*/}
```

You snip out the middle lines and put them into a text file for formatting and spell-checking. You want to get rid of all of the asterisks until you are done.

This function gets rid of all the asterisks. You can use *shu-add-prefix* to put them back.

`diff-commits` *commit-range* [Command]
(Function: shu-git-diff-commits)

In a buffer that is a numbered git log, query for a range string, find the two commits, and put into the kill ring a git diff command specifying the two commits.

For example, given the following two numbered commits:

```
31. commit 38f25b6769385dbc3526f32a75b97218cb4a6754
33. commit 052ee7f4297206f08d44466934f1a52678da6ec9
```

if the commit range specified is either "31.33" or "31+2", then the following is put into the kill ring:

```
``git diff -b 38f25b6769385dbc3526f32a75b97218cb4a6754..052ee7f4297206f08d44466934f1
```

`dup` [Command]
(Function: shu-dup)

Insert a duplicate of the current line, following it.

`eld` [Command]
(Function: shu-save-and-load)
Save and load the current file as a .el file.

`gd` [Command]
(Function: shu-gd)
While in dired, put the full path to the current directory in the kill ring

`gf` [Command]
(Function: shu-gf)
While in dired, put the full path to the current file in the kill ring

`gfc` [Command]
(Function: shu-gfc)
While in a file buffer, put both the current line number and column number and the name of the current file into the kill ring in the form of "foo.cpp:123:2".

`gfl` [Command]
(Function: shu-gfl)
While in a file buffer, put both the current line number and the name of the current file into the kill ring in the form of "line 1234 of foo.cpp".

`gfn` [Command]
(Function: shu-gfn)
While in a file buffer, put the name of the current file into the kill ring.

`git-branch` [Command]
(Function: shu-git-find-branch)
Return the name of the current branch in a git repository.

`gquote` [Command]
(Function: shu-gquote)
Insert a LaTeX quote environment and position the cursor for typing the quote.

`loosen-lisp` [Command]
(Function: shu-loosen-lisp)
Within the bounds of a lisp function, unwind the parentheses that terminate conditional and containing functions such that it is convenient to insert code inside of them without having to worry about which line contains the closing parenthesis. All closing parentheses are now on separate lines. Once the

changes to the function are complete, you can run *shu-tighten-lisp* to put the parentheses back where they belong.

`md-name` [Command]
(Function: shu-make-md-name-entry)

The latest item in the kill ring is assumed to be the text of a markdown section name. This function creates from that section name, a markdown table of contents name that will identify the section in the table of contents.

For example, if the kill ring contains "## This is the Overview", the table of contents name created and inserted at point will be:

```
<a name=thisistheoverview></a>
```

`md-toc` [Command]
(Function: shu-make-md-toc-entry)

The latest item in the kill ring is assumed to be the text of a markdown section name. This function creates from that section name, a markdown table of contents entry and inserts that entry at point.

For example, if the kill ring contains "## This is the Overview ##", the table of contents entry created and inserted at point will be

```
* [This is the overview](#thisistheoverview)
```

`modified-buffers` [Command]
(Function: shu-modified-buffers)

Show a list of all buffers associated with files whose status is modified. It is not uncommon to have many emacs windows open and to realize that one window has a file open and another window is also trying to edit it. emacs warns the second window of the conflict, but it is sometimes difficult to tell which window holds the modified buffer. The buffer list shows you all of the buffers with an asterisk next to each modified buffer, but if the buffer list is large, it can be difficult to find the one you seek. This command lists only modified buffers that hold the contents of a file.

`new-ert` *func-name* [Command]
(Function: shu-new-ert)

Insert at point a skeleton lisp ert unit test. Prompt is issued for the function name.

`new-latex` [Command]
(Function: shu-new-latex)
Build a skeleton, empty LaTeX file.

`new-lisp` *func-name* [Command]
(Function: shu-new-lisp)
Insert at point a skeleton lisp function. Prompt is issued for the function name.

`new-lisp-while` *var-name* [Command]
(Function: shu-new-lisp-while)
Insert at point a skeleton lisp while loop. Prompt is issued for the variable name. The while loop is of the form:

```
(while x

  (setq x (cdr x))
  )
```

point is placed where the the first line of code in the loop belongs.

`number-commits` [Command]
(Function: shu-git-number-commits)
In a git log buffer, number all of the commits with zero being the most recent.

It is possible to refer to commits by their SHA-1 hash. If you want to see the difference between two commits you can ask git to show you the difference by specifying the commit hash of each one. But this is cumbersome. It involves copying and pasting two SHA-1 hashes. Once the commits are numbered, then *shu-git-diff-commits* may be used to diff two commits by number. See the documentation for *shu-git-diff-commits* for further information.

This function counts as a commit any instance of "commit" that starts at the beginning of a line and is followed by some white space and a forty character hexadecimal number. Returns the count of the number of commits found.

`number-lines` [Command]
(Function: shu-number-lines)
Insert in front of each line in the buffer its line number. Starts at point and continues to the end of the buffer.

`of` [Command]
(Function: shu-of)

While in dired, open the current file (Mac OS X only)

`remove-test-names` [Command]
(Function: shu-remove-test-names)
Remove from a file all lines that contain file names that end in .t.cpp

`reverse-comma-names` [Command]
(Function: shu-reverse-comma-names)
In a list of names, change all occurrences of Lastname, Firstname to Firstname Lastname. Position to the start of the file and invoke once.

`set-dos-eol` [Command]
(Function: shu-set-dos-eol)
Set the end of line delimiter to be the DOS standard (CRLF).

`set-unix-eol` [Command]
(Function: shu-set-unix-eol)
Set the end of line delimiter to be the Unix standard (LF).

`tighten-lisp` [Command]
(Function: shu-tighten-lisp)
Within the bounds of a lisp function or macro, "tighten" some lisp code. Look for any single right parenthesis that is on its own line and move it up to the end of the previous line. This function is the opposite of *shu-loosen-lisp*

`trim-trailing-blanks` [Command]
(Function: shu-trim-trailing-blanks)
Eliminate whitespace at ends of all lines in the current buffer.

`winpath` *start end* [Command]
(Function: shu-winpath)
Take marked region, put in kill ring, changing / to Ṫhis makes it a valid path on windows machines.

13.2 List of functions and variables

List of functions and variable definitions in this package.

`shu-add-prefix` *prefix* [Command]
(Alias: add-prefix)
Put a prefix and a space in front of each line in the region. Prompt is issued for the prefix.

`shu-all-quit` [Command]
(Alias: all-quit)

Kill all dired buffers and all buffers that contain a file and are unmodified. It is not uncommon to have dozens of buffers open that are unrelated to the current task and this is a convenience function for closing many buffers that do not need to be open.

`shu-buffer-number-lines` [Command]
(Alias: buffer-number-lines)

Create a buffer whose name is derived from the file name of the current buffer but with the string "-numbered" added to the name. Thus "foo.cpp" would become "foo-numbered.cpp" Into this new buffer, copy the contents of the current file with each line prefixed with its line number. This is designed for those times when you want to copy snippets of code with the line number in front of each line because you are commenting on code and want the person receiving the comments to sea the line number in front of each line.

`shu-case-insensitive` [Command]
(Alias: case-insensitive)

Set the variable case-fold-search to t to make searches and matches ignore case. I can never remember which way to set case-fold-search, hence this simple, little function.

`shu-case-sensitive` [Command]
(Alias: case-sensitive)

Set the variable case-fold-search to nil to make searches and matches respect case. I can never remember which way to set case-fold-search, hence this simple, little function.

`shu-comma-names-to-letter` [Command]
(Alias: comma-names-to-letter)

In a list of names, change all occurrences of Lastname, Firstname to an empty Latex letter. Position to the start of the file and invoke once.

`shu-conditional-find-file` *file-name* [Command]

Make the buffer for *file-name* the current buffer. If *file-name* is already loaded into a buffer, then make that the current buffer. If *file-name* is not loaded into a buffer, load the file into a buffer and make that the current buffer. Return true if this function created the buffer, nil otherwise.

This function is intended to handle the situation in which a function wants to visit the contents of several files but does not want to leave behind a lot of

file buffers that it created.

If this function returns true, then the calling function should kill the buffer when it is finished with it.

`shu-de-star` [Command]
(Alias: de-star)

Remove leading spaces and asterisk from each line in the region. This is useful for editing doxygen comments of the form:

/*!

```
* This is some commentary.
* This is more commentary, etc.
\emph{*/}
```

You snip out the middle lines and put them into a text file for formatting and spell-checking. You want to get rid of all of the asterisks until you are done.

This function gets rid of all the asterisks. You can use *shu-add-prefix* to put them back.

`shu-dired-mode-name` [Constant]

The name of the mode for a dired buffer

`shu-disabled-quit` [Command]

Explain that C-x C-c no longer kills emacs. Must M-x quit instead. Far too often, I hit C-x C-c by mistake and emacs vanishes. So I map C-x C-c to this function and use an explicit M-x quit to exit emacs.

`shu-dup` [Command]
(Alias: dup)

Insert a duplicate of the current line, following it.

`shu-eob` [Command]

Go to end of buffer without setting mark. Like end-of-buffer but does not set mark - just goes there.

`shu-erase-region` *start end* [Function]

Replace everything in the region between *start* and *end* with blanks. This is exactly like delete-region except that the deleted text is replaced with spaces. As with delete-region, the end point is not included in the delete. It erases everything up but not including the end point. The order of *start* and *end* does not matter.

`shu-find-numbered-commit` *commit-number* [Function]
Search through a numbered git commit log looking for the commit whose number is *commit-number*. Return the SHA-1 hash of the commit if the commit number is found. Return nil if no commit with the given number is found. The commit log is assume to have been numbered by shu-git-number-commits.

`shu-fix-times` [Command]
Go through a buffer that contains timestamps of the form

```
YYYY-MM-DDTHHMMSS.DDD
```

converting them to the form

```
YYYY-MM-DD HH:MM:SS.DDD
```

The latter is a format that Microsoft Excel can import.

`shu-forward-line` [Function]
Move forward by one line. If there is a next line, point it moved into it. If there are no more lines, a new one is created.

`shu-gd` [Command]
(Alias: gd)
While in dired, put the full path to the current directory in the kill ring

`shu-get-current-line` [Function]
Return the current line in the buffer as a string

`shu-gf` [Command]
(Alias: gf)
While in dired, put the full path to the current file in the kill ring

`shu-gfc` [Command]
(Alias: gfc)
While in a file buffer, put both the current line number and column number and the name of the current file into the kill ring in the form of "foo.cpp:123:2".

`shu-gfl` [Command]
(Alias: gfl)

While in a file buffer, put both the current line number and the name of the current file into the kill ring in the form of "line 1234 of foo.cpp".

`shu-gfn` [Command]
(Alias: gfn)
While in a file buffer, put the name of the current file into the kill ring.

`shu-git-add-file` *filename* [Function]
Do a "git add" for *filename*. Return empty string if add succeeds. Otherwise, return git error message.

`shu-git-diff-commits` *commit-range* [Command]
(Alias: diff-commits)
In a buffer that is a numbered git log, query for a range string, find the two commits, and put into the kill ring a git diff command specifying the two commits.

For example, given the following two numbered commits:

```
31. commit 38f25b6769385dbc3526f32a75b97218cb4a6754
33. commit 052ee7f4297206f08d44466934f1a52678da6ec9
```

if the commit range specified is either "31.33" or "31+2", then the following is put into the kill ring:

```
``git diff -b 38f25b6769385dbc3526f32a75b97218cb4a6754..052ee7f4297206f08d44466934f1
```

`shu-git-find-branch` [Command]
(Alias: git-branch)
Return the name of the current branch in a git repository.

`shu-git-find-short-hash` *hash* [Function]
Return the git short hash for the *hash* supplied as an argument. Return nil if the given *hash* is not a valid git revision.

`shu-git-number-commits` [Command]
(Alias: number-commits)
In a git log buffer, number all of the commits with zero being the most recent.

It is possible to refer to commits by their SHA-1 hash. If you want to see the difference between two commits you can ask git to show you the difference by

specifying the commit hash of each one. But this is cumbersome. It involves copying and pasting two SHA-1 hashes. Once the commits are numbered, then *shu-git-diff-commits* may be used to diff two commits by number. See the documentation for *shu-git-diff-commits* for further information.

This function counts as a commit any instance of "commit" that starts at the beginning of a line and is followed by some white space and a forty character hexadecimal number. Returns the count of the number of commits found.

`shu-gquote` [Command]
(Alias: gquote)

Insert a LaTeX quote environment and position the cursor for typing the quote.

`shu-internal-new-lisp` *func-type func-name doc-string interactive* [Command]

Insert at point a skeleton lisp function of type *func-type* whose name is *func-name*. *func-type* is not examined in any way but is only useful if its value is "defun", "defmacro", "ert-deftest", etc. If *interactive* is true, the function is interactive.

`shu-kill-current-buffer` [Command]

Kills the current buffer.

`shu-local-replace` *from-string to-string* [Function]

Replaces *from-string* with *to-string* anywhere found in the buffer. This is like replace-string except that it is intended to be called by lisp programs. Note that this function does not alter the value of case-fold-search. The user should set it before calling this function.

`shu-loosen-lisp` [Command]
(Alias: loosen-lisp)

Within the bounds of a lisp function, unwind the parentheses that terminate conditional and containing functions such that it is convenient to insert code inside of them without having to worry about which line contains the closing parenthesis. All closing parentheses are now on separate lines. Once the changes to the function are complete, you can run *shu-tighten-lisp* to put the parentheses back where they belong.

`shu-make-md-index-name` *name* [Function]

The input is a string that is assumed to be a markdown section heading from a markdown table of contents. The return value is an all lower case string

with any whitespace characters removed. For example, if the input string is

```
This is an Overview
```

The returned string would be

```
thisisanoverview
```

`shu-make-md-name-entry` [Command]
(Alias: md-name)

The latest item in the kill ring is assumed to be the text of a markdown section name. This function creates from that section name, a markdown table of contents name that will identify the section in the table of contents.

For example, if the kill ring contains "## This is the Overview", the table of contents name created and inserted at point will be:

```
<a name=thisistheoverview></a>
```

`shu-make-md-section-name` *section-name* [Function]

The input is a string that is assumed to be a markdown section heading. The return value is a string with any leading and trailing "#" characters removed. For example, if the input string is

```
## This is an Overview ##
```

The returned string would be

```
This is an Overview
```

`shu-make-md-toc-entry` [Command]
(Alias: md-toc)

The latest item in the kill ring is assumed to be the text of a markdown section name. This function creates from that section name, a markdown table of contents entry and inserts that entry at point.

For example, if the kill ring contains "## This is the Overview ##", the table of contents entry created and inserted at point will be

```
* [This is the overview](#thisistheoverview)
```

`shu-misc-set-alias` [Function]

Set the common alias names for the functions in shu-misc. These are generally the same as the function names with the leading shu- prefix removed.

`shu-modified-buffers` [Command]

(Alias: modified-buffers)

Show a list of all buffers associated with files whose status is modified. It is not uncommon to have many emacs windows open and to realize that one window has a file open and another window is also trying to edit it. emacs warns the second window of the conflict, but it is sometimes difficult to tell which window holds the modified buffer. The buffer list shows you all of the buffers with an asterisk next to each modified buffer, but if the buffer list is large, it can be difficult to find the one you seek. This command lists only modified buffers that hold the contents of a file.

`shu-move-down` *arg* [Command]

Move point vertically down. Whitespace in any direction is made if necessary. New lines will be added at the end of a file and lines that are too short will be expanded as necessary.

`shu-new-ert` *func-name* [Command]

(Alias: new-ert)

Insert at point a skeleton lisp ert unit test. Prompt is issued for the function name.

`shu-new-latex` [Command]

(Alias: new-latex)

Build a skeleton, empty LaTeX file.

`shu-new-lisp` *func-name* [Command]

(Alias: new-lisp)

Insert at point a skeleton lisp function. Prompt is issued for the function name.

`shu-new-lisp-while` *var-name* [Command]

(Alias: new-lisp-while)

Insert at point a skeleton lisp while loop. Prompt is issued for the variable name. The while loop is of the form:

```
(while x

  (setq x (cdr x))
  )
```

point is placed where the the first line of code in the loop belongs.

`shu-number-lines` [Command]
(Alias: number-lines)
Insert in front of each line in the buffer its line number. Starts at point and continues to the end of the buffer.

`shu-of` [Command]
(Alias: of)
While in dired, open the current file (Mac OS X only)

`shu-put-line-near-top` [Command]
Take the line containing point and position it approximately five lines from the top of the current window.

`shu-quit` [Command]
Invoke save-buffers-kill-emacs. This is the function normally invoked by C-x C-c

`shu-remove-test-names` [Command]
(Alias: remove-test-names)
Remove from a file all lines that contain file names that end in .t.cpp

`shu-reverse-comma-names` [Command]
(Alias: reverse-comma-names)
In a list of names, change all occurrences of Lastname, Firstname to Firstname Lastname. Position to the start of the file and invoke once.

`shu-save-and-load` [Command]
(Alias: eld)
Save and load the current file as a .el file.

`shu-set-buffer-eol-type` *eol-type* [Function]
Define what the end of line delimiter is in a text file.

`shu-set-dos-eol` [Command]
(Alias: set-dos-eol)

Set the end of line delimiter to be the DOS standard (CRLF).

`shu-set-mac-eol` [Command]
Set the end of line delimiter to be the Mac standard (CR).

`shu-set-unix-eol` [Command]
(Alias: set-unix-eol)
Set the end of line delimiter to be the Unix standard (LF).

`shu-shift-line` *count* [Command]
Shift a line of text left or right by *count* positions. Shift right if *count* is positive, left if *count* is negative. Shifting left only eliminates whitespace. If there is a non-whitespace character in column 5, then shift by -10 will only shift left 4.

`shu-shift-region-of-text` *count start end* [Command]
Shift a region of text left or right. The test to be shifted is defined by the bounds of lines containing point and mark. The shift count is read from the minibuffer.

`shu-shift-single-line` *count* [Function]
Shift a line of text left or right by *count* positions. Shift right if *count* is positive, left if *count* is negative. Shifting left only eliminates whitespace. If there is a non-whitespace character in column 5, then shift by -10 will only shift left 4.

`shu-split-range-string` *range-string* [Function]
range-string is a string that contains either one or two numbers, possibly separated by plus, minus, or period. If one number then it is the starting number and there is no ending number. If two numbers then the first number is the start. The operator in the middle determines the end. If plus, then the end is the second number added to the first. If minus, then the end is the second number subtracted from the first. If period, then the end is the second number.

Return the two numbers as a cons cell (start . end). If there is no end then the cdr of the cons cell is nil. If range string is not numeric, then both the car and the cdr of the cons cell are nil.

For example, "99+2" has start 99 and end 101. "99-2" has start 99 and end 97. "99.103" has start 99, end 103. "98" has start 98 and end is nil.

`shu-tighten-lisp` [Command]

(Alias: tighten-lisp)

Within the bounds of a lisp function or macro, "tighten" some lisp code. Look for any single right parenthesis that is on its own line and move it up to the end of the previous line. This function is the opposite of *shu-loosen-lisp*

`shu-trim-trailing-blanks` [Command]

(Alias: trim-trailing-blanks)

Eliminate whitespace at ends of all lines in the current buffer.

`shu-winpath` *start end* [Command]

(Alias: winpath)

Take marked region, put in kill ring, changing / to Ṫhis makes it a valid path on windows machines.

14 shu-nvplist

elisp code for maintaining directories of name / value pairs.

14.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-get-item-nvplist` *item* [Function]
Return the name value pair list from an item.

`shu-nvplist-get-item-number` *item* [Function]
Return the item number for an item.

`shu-nvplist-get-item-value` *name item* [Function]
Extract a named list of values from an item. *name* is the name of the values to find. *item* is the item from which to extract the values. A list is returned that contain all of the values whose name matches *name*.

`shu-nvplist-make-item` *item-number nvplist* [Function]
Create an item entry from an item number and a name value pair list. The item entry is just a cons cell with the item number in the CAR and the name-value pair list in the CDR.

`shu-nvplist-make-nvpair-list` *tlist* [Function]
Turn a list of tokens from an entry in the file into a list of name value pairs. The CAR of each entry in the list is the name. The CDR of each entry in the list is the value. If errors are found in the token list, then an empty list is returned.

`shu-nvplist-make-token-list` *tlist* [Function]
Turn an entry in a name / value file into a list of tokens. The CAR of each entry is the point at which the token starts. the CDR of each entry in the list is the token itself. On entry to this function, point is immediately after the start delimiter ("<"). On return, point is positioned immediately after the end delimiter ("/>").

`shu-nvplist-parse-buffer` *item-list* [Function]
Parse an nvplist buffer, putting all of the items in the *item-list*.

`shu-nvplist-parse-file` *file-name file-type* [Function]

Parse a file full of name value pair lists. The name of the file is *file-name*. The type of the file (only for error messages) is *file-type*. *item-list* is the head of the returned item list.

`shu-nvplist-show-item` *item* [Function]
Undocumented

`shu-nvplist-show-item-list` *item-list* [Function]
Undocumented

15 shu-org-extensions

The major function of this file is the function *shu-org-archive-done-tasks*, which can be used as an after-save-hook for org files. It finds each TODO item that was marked DONE more than SHU-ORG-ARCHIVE-EXPIRY days ago and moves it to an archive file by invoking org-archive-subtree on it.

15.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-org-archive-done-tasks` [Command]
Go through an org file and archive any completed TODO item that was completed more than shu-org-archive-expiry-days days ago.

`shu-org-archive-expiry-days` [Variable]
Number of elapsed days before a closed TODO item is automatically archived.

`shu-org-date-match-regexp` [Function]
Return a regexp string that matches an org date of the form 2012-04-01 Tue 13:18.

`shu-org-done-keywords` [Variable]
Key words that represent the DONE state.

`shu-org-done-projects-string` [Function]
Return a string that is a search for a TODO tag that does not contain any of the words that represent a DONE item. These are the words defined in org-done-keywords-for-agenda. If the two keywords that mean finished item are DONE and CANCELLED, then this function will return the string: TODO={.+}/-CANCELLED-DONE. This is intended to be used in the definition of the variable "org-stuck-projects".

`shu-org-home` [Variable]
Home directory of the org data files.

`shu-org-state-regexp` *done-word* [Function]
Return a regular expression that will match a particular TODO state record of the form - State "DONE" from "CANCELLED" [2012-04-01 Tue 13:18] *done-word* is the desired state of the record.

`shu-org-todo-keywords` [Variable]

Key words that represent the not DONE state.

16 shu-xref

A set of functions that scan a set of elisp files and create a cross reference of all of the definitions (functions, macros, constants, variables, etc.). See the doc string for *shu-make-xref* for further details.

16.1 List of functions and variables

List of functions and variable definitions in this package.

`shu-get-all-definitions` *fun-defs* [Function]
Find all of the emacs lisp function definitions in the current buffer.

`shu-make-xref` *start end* [Command]
Mark a region in a file that contains one name per line of an emacs lisp file Then invoke shu-make-xref. It will do a cross reference of all of those files.

`shu-xref-buffer` [Constant]
The name of the buffer into which the cross reference is placed.

`shu-xref-dump` *fun-defs max-var-name-length* [Function]
Undocumented

`shu-xref-file-compare` *t1 t2* [Function]
Compare the file names from two variable names. Return t if the file name in *t1* comes before the type name in *t2*. If the file names are the same, then compare the variable names so that variables are in alphabetical order within file.

`shu-xref-get-defs` *file-list fun-defs* [Function]
Extract the variable definitions from each file.

`shu-xref-get-file-list` *start end file-list* [Command]
Return a list of file names from a region of a buffer. *start* and *end* define the region. Each line in the region is assumed to be a file name. *file-list* is the list that is also the return value of this function.

`shu-xref-get-longest-name` *fun-defs* [Function]
Return the length of the longest variable name in the list and the longest type name in the list. These are returned as a cons cell with the length of the longest type name in the CAR and the longest variable name in the CDR.

`shu-xref-get-next-definition` *retval* [Function]

Find and return the next definition of an emacs lisp function of variable. *retval* is returned as nil if there are no more function definitions after point. If a definition is found, *retval* is returned as a cons cell with the name of the function in the CAR and the information about the function in the CDR. The information in the CDR is a cons cell with the numeric variable type in the CAR and the line number in which the definition started in the CDR.

`shu-xref-get-next-funcall` *name retval* [Function]

Find and return the next call to the emacs lisp function *name*. *retval* is returned as nil if there are no more function invocations after point. If a function invocation is found, *retval* is returned as a cons cell with the name of the function in the CAR and the line number in which the function definition starts in the CDR.

`shu-xref-lisp-name` [Constant]

A regular expression to match a variable name in emacs lisp.

`shu-xref-type-compare` *t1 t2* [Function]

Compare the type names from two variable names. Return t if the type name in *t1* comes before the type name in *t2*. If the type names are the same, then compare the variable names so that variables are in alphabetical order within type.

`shu-xref-var-types` [Constant]

Associate a number with each type of variable

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