Programming Language Support — C

Description			Inguage Support — C	
Description Editing C Files	Keystroke Emacs supports C natively via	Function the built-in c-mode which ext	Note ends the CC Mode that support the curly-bracket programming languages like C.	
CC Mode	PEL activates support for	PEL activates support for C when one or both of the pel-use-c or pel-use-bison user-option variables is set.		
File extensionsC	 Supported file extensions: code files: .c, .lex, .y, .yacc, header files: .h, .i If pel-use-bison-mode is set, the .y and .yacc files are associated with bison-mode, the .l and .lex with flex-mode and .jison with jison-mode 			
 bison-mode Speedbar 			es are associated with pison-mode, the .i and .iex with flex-mode and .jison with jison-mode ecognized by speedbar, otherwise only the main ones are recognized.	
<u> </u>	Important aspects of C sou	urce code syntax controlled by	the CC Mode are customizable with PEL user option variables.	
		Simplifies configuration for edup: pel-pkg-for-c (access with	· ·	
indentation	pel-c-indent-width: lo		s used for indentation. Defaults to 3.	
	This concept differs	from indentation: you can have	e an indentation of 3 and tab width of 8: M-i will move point to columns that are multiple of 8	
		· ·	PEL stores this value inside the tab-width variable for c-mode buffers.e width of your needed indentation level. This way you can use commands that use either to	
 using tabs 	control the indentat	ion level.		
bracket style	C code style sub-grou	p: pel-c-code-style	tation or not: t: tabs are used, nil: only spaces are used. Default: nil.	
			ccurs: maximum line length (defaults to 80). You can change the value or set it nil. e buffers use the Emacs fill-column value like other major modes.	
		: The <u>bracket/indentation style</u> er' with some Emacs Lisp code	e supported by the electric keys. You can select one of the values supported by Emacs or Default to "linux"	
			templates created with PEL tempo skeletons. They are described in tempo skeleton section	
	Emacs customization gro		o all CC Mode related modes (like c-mode).	
	The values for those user	option variables can also be s	ode is active on all CC Mode (including c-mode). tored inside directory local files and even as file local variables. You can also modify them for	
			nmands listed in the following set of rows. See <u>File/Directory Variables</u> for more info. change the value for the current buffer only.	
			efixes: <f11> SPC c as well as <f12> and <m-f12></m-f12></f12></f11>	
	-		n in keystroke cells (for brevity). The other two prefixes are only available in c-mode buffers.	
Open this PDF file. See also: <u>∑ Help/Info</u>	<f11> SPC c <f1></f1></f11>	(pel-help-pdf &optional OPEN-WEB-PAGE)	Open the <u>\$\mathbf{Y}_i - C}</u> local PDF. If the prefix argument (like C-u or M) is used, then it opens the remote GitHub hosted raw PDF instead. If the pel-flip-help-pdf-arg user-option is set it's the	
	<f12> <f1></f1></f12>	·	other way around.	
<u>> Customize</u> PEL C support	• <f12> <f2> • <f21> # <f2></f2></f21></f2></f12>	(pel-customize-pel &optional OTHER-WINDOW)	Customize PEL C support. • If OTHER-WINDOW is non-nil (use C-u), display in another window.	
∑ Customize Emacs C support	<f12> <f3></f3></f12>	(pel-customize-library &optional OTHER-WINDOW)	Customize Emacs C support: c, c-macro, bison-mode, electricity • If OTHER-WINDOW is non-nil (use C-u), display in another window.	
∑ Customize Emacs C pre-processor support	<f12> #f3></f12>	(pel-customize-library &optional OTHER-WINDOW)	Customize Emacs C pre-processor support: hide-ifdef. • If OTHER-WINDOW is non-nil (use C-u), display in another window.	
CC Mode Style	Automatic indentation, brace f You can impose an indentat		Stylistic elements are controlled by the CC Mode and the CC mode variables.	
ManagementLearn style	You can also adjust the styl	e to what is used in the current	t buffer: Emacs provides the following commands to parse the source code and identify the style	
used in	i		iables from what it detects in the buffer. want to continue using the same style.	
current buffer	Sor the following comma	nds all commands that use a k	ey binding that ends with an upper case letter install the style.	
Show/Modify syntactic context	C-c C-o	(c-set-offset SYMBOL OFFSET &optional	Change the value of a syntactic element symbol in 'c-offsets-alist'. • SYMBOL is the syntactic element symbol to change and OFFSET is the new offset for that	
<u> </u>		IGNORED)	syntactic element. The optional argument is not used.	
Show syntactic information for	C-c C-s	(c-show-syntactic- information ARG)	Show syntactic information for current line. • Display the syntactic information list and highlight the reference position(s) listed as argument	
current line			to the syntactic list. • Each list starts with a syntactic symbol with zero or several reference positions.	
			With universal argument, inserts the analysis as a comment on that line.	
Guess the style used in the current buffer,	<f12> <f4> g g</f4></f12>	(c-guess-buffer-no-install & optional ACCUMULATE)	Guess the style on the whole current buffer; don't install it. • If given a prefix argument (or if the optional argument ACCUMULATE is non-nil) then the	
do not install it		,	previous guess is extended, otherwise a new guess is made from scratch.	
Guess the style of the code in the buffer and	<f12> <f4> g B</f4></f12>	(c-guess-buffer &optional ACCUMULATE)	Guess the style on the whole current buffer, and install it. • The style is given a name based on the file's absolute file name.	
install it.			 If given a prefix argument (or if the optional argument ACCUMULATE is non-nil) then the previous guess is extended, otherwise a new guess is made from scratch. 	
Guess style in the	<f12> <f4> g G</f4></f12>	(c-guess &optional	Guess the style using the first 'c-guess-region-max' bytes of the file, and install it.	
region and install it.		ACCUMULATE)	 The c-guess-region-max user-option defaults to 50,000 bytes, nil means all buffer. The style is given a name based on the file's absolute file name. 	
			 If given a prefix argument (or if the optional argument ACCUMULATE is non-nil) then the previous guess is extended, otherwise a new guess is made from scratch. 	
Guess the style of a	<f12> <f4> g R</f4></f12>	(c-guess-region START	Guess the style on the region and install it.	
region and install it.		END &optional ACCUMULATE)	 The style is given a name based on the file's absolute file name. If given a prefix argument (or if the optional argument ACCUMULATE is non-nil) then the 	
			previous guess is extended, otherwise a new guess is made from scratch.	
Set buffer style to guessed style and	<f12> <f4> g I</f4></f12>	(c-guess-install &optional STYLE-NAME)	Install the latest guessed style into the current buffer. • This guessed style is a combination of 'c-guess-guessed-basic-offset', 'c-guess-guessed-	
install it.		,	offsets-alist' and 'c-offsets-alist'. • The style is entered into CC Mode's style system by 'c-add-style'. Its name is either STYLE-	
			NAME, or a name based on the absolute file name of the file if STYLE-NAME is nil.	
View Guessed style as a set of Emacs	<f12> <f4> g ?</f4></f12>	(c-guess-view &optional WITH-NAME)	Emit emacs lisp code which defines the last guessed style, so you can put the code into .emacs if you prefer the guessed code.	
Lisp statements		WITH-NAIVIL)	"STYLE NAME HERE" is used as the name for the style in the emitted code. If WITH-NAME is	
			given, it is used instead. WITH-NAME is expected as a string but if this function called interactively with prefix argument, the value for WITH-NAME is asked to the user.	
CC Mode support			the behaviour of important keys such as the return key, delete key, semi-colon, etc	
Behaviour control	activated) and provide a better	experience when editing C so	urce code.	
		in the mode line: £ C{} when gramming language name: C, C		
	C is the C comment st	yle: '*' for block command (/* */) and ',' for line comments (//)	
	• {} are the other elect • '1' for electric mode			
	'a' for auto-newline'h' for hungry mode			
	• 'w' for subword mod		Use <f12> M−?</f12> to display the current state.	

<u>Description</u>	<u>Keystroke</u>	Function	<u>Note</u>
Toggle Electric state	• C-c C-l • <f12> <f4> e</f4></f12>	(c-toggle-electric-state &optional ARG)	Toggle the electric indentation feature done with the electric character keys. • Optional numeric ARG, if supplied, turns on electric indentation when positive, turns it off when negative, and just toggles it when zero or left out.
Set indentation style	• C-c . • <f12> <f4> s</f4></f12>	(c-set-style STYLENAME &optional DONT-OVERRIDE)	Set the <u>bracket/indentation style</u> for the current buffer. Prompts for the name. Supports tab completion (so use tab to see the list). Can be one of the <u>values supported by Emacs</u> but you can also add your customized mode with some Emacs Lisp code.
Change indentation width for current buffer	<f12> <f4> TAB</f4></f12>	(pel-cc-set-indent-width &optional NEW-WIDTH)	Interactively change the Indentation with for current buffer to NEW-WIDTH. • Prompt for new value. • Use 0 to restore value specified by configuration (pel-c-indent-width). Solution This can be used to change indentation several times in a file.
Toggle syntactic indentation	<f12> <f4> i</f4></f12>	(c-toggle-syntactic- indentation &optional ARG)	Toggle syntactic indentation. Toggle if no ARG or if ARG is 0. • With positive ARG turn on syntactic indentation, turns it off when negative.
	 When it's turned off, the election M-x c-indent-command adjusted 	ctric keys don't reindent, the in	dentation functions and electric keys indent according to syntactic context keys, when applicable. dentation functions indents every new line to the same level as the previous nonempty line, and becified by 'c-basic-offset'. The indentation style has no effect in this mode, nor any of the ok'.
Toggle Comment Style	• C-c C-k • <f12> <f4> M-;</f4></f12>	(c-toggle-comment-style &optional ARG)	Toggle the comment style between block and line comments. Optional numeric ARG, if supplied, switches to block comment style when positive, to line comment style when negative, and just toggles it when zero or left out. The C++ style // comments (also called line comments) are compatible with C since C-99.
Toggle Hungry Delete mode	<f12> <f4> DEL</f4></f12>	(c-toggle-hungry-state &optional ARG)	Toggle hungry-delete-key feature. Affects and C-d keys. Optional numeric ARG, if supplied, turns on hungry-delete when positive, turns it off when negative, and just toggles it when zero or left out. When the hungry-delete-key feature is enabled (indicated by "/h" on the mode line after the mode name) the delete key gobbles all preceding whitespace in one fell swoop.
Toggle text alignment on pel-newline-and-indent-below See also: • ∑ Align • ∑ Indentation	<f11> M-RET</f11>	(pel-toggle-newline- indent-align)	Toggle variable pel-newline-does-align for the local buffer. This toggles the way function 'pel-newline-and-indent-below' operates. If pel-newline-does-align is t, it aligns several syntactic element in the current block: the comments, the assignments. If pel-newline-does-align is automatically activated (set to t) by adding the major mode to the list in the pel-modes-activating-align-on-return user option. This affects the behaviour of the following commands: pel-cc-newline (assigned to RET in CC modes like c-mode, c++-mode and d-mode). pel-newline-and-indent-below (assigned the M-RET)
Toggle auto-newline insertion mode	• C-c C-a • <f12> <f4> M-RET</f4></f12>	(c-toggle-auto-newline &optional ARG)	Toggle auto-newline feature. Optional numeric ARG, if supplied, turns on auto-newline when positive, turns it off when negative, and just toggles it when zero or left out. Turning on auto-newline automatically enables electric indentation. When the auto-newline feature is enabled (indicated by "/la" on the mode line after the mode name) newlines are automatically inserted after special characters such as brace, comma, semi-colon, and colon.
Change RET key behaviour: select return mode.	<f12> <f4> RET</f4></f12>	(pel-cc-change-newline-mode)	Change the way the RET key behaves in the CC modes and display the new mode in the echo area. Changes from one mode to the next and then rotate to the first one. The modes are: 1. context-newline: the default: uses (c-context-line-break) with the extra ability to repeat its execution with an argument. 2. newline-and-indent: uses (newline ARG t) to insert newline and indent. 3. just-newline-no-indent: uses (electric-indent-just-newline ARG) Emacs default is to use newline. PEL sets the default to c-context-line-break which provides more functionality for CC modes. A mode change is local to the current buffer and does not affect RET key behaviour in the other buffers using the same mode. PEL user option pel-initial-c-newline-mode can be set to change the default for c-mode.
Display current Mode	<f12> <f4> ?</f4></f12>	(pel-cc-mode-info)	Display information about current CC mode derivative for the current c-mode buffer.
settings	The information includes the following: CC mode style currently active, along with a list of styles associated with current mode. Change it for the current buffer with C-c ⋅ or <f12> <f4> s. The Emacs the c-default-style user option defines associations between major modes and the style to use. PEL provides the pel-c-backet-style that is used to set the style for c-mode. Use <f12> <f2> form a c-mode buffer to access the customization buffer to change it. RET (return key) mode. Change with pel-cc-change-newline-mode (<f12> <f4> RET). Whether return performs alignment. Change that with pel-toggle-indent-align (<f11> M-RET). State of electric C characters (toggle it or/off with c-toggle-electric-state (C-c C-1 or <f12> <f4> e): whether it is active or not, and when active what character(s) exhibit electric behaviour. if auto-newline on some characters (;* and some other based on style) is active. Toggle it with C-c C-a or <f12> <f4> M-RET. The fill column: the column where force line wrap is done when the auto-fill-mode is active. Toggle auto fill mode with <f11> RET. Tab width and whether hard tabs are used. These are set by the user options pel-c-tab-width and pel-c-use-tabs. In c-mode buffer use <f12> <f2> <f2> to open the appropriate customization buffer to change them. Be Remember that tab width does not identify the indentation. It controls the spacing used in some commands moving point to the next tab stop column. Indentation is controlled separately. See next line. Indentation width controlled by c-basic-offset normally set by pel-c-indent-width one pel-c-use-tabs. The style currently used for indentation and bracket positioning (they should have the same value). Emacs identifies several built-in styles but you can create your own. The example below shows "bsd" with is another name for the Allman style. You can dynamically change for the current buffer with c-set-style command (C-c or <f12> <f4> s). CC Mode styles identify everything, including the number of indentation columns. PEL configure</f4></f12></f2></f2></f12></f11></f4></f12></f4></f12></f11></f4></f12></f2></f12></f4></f12>		
	-UU-:F1 c_file.c c-mode state:		WK Anzu Fly ² ElDoc Abv) 10:35am 1.97
Notice the name of the PEL user-options that set the significant feature controlling Emacs variables in the message	- RET mode : co - Electric characters : ac - Auto newline : on	, auto-filling: off. Set via aces only Set via Set via	<pre>: pel-c-tab-width(8) ==> tab-width(8) when c-mode buffer is opened. : pel-c-use-tabs(nil) ==> indent-tabs-mode(nil) when c-mode buffer is opened. : pel-c-indent-width(4) ==> c-basic-offset(4) when c-mode buffer is opened.</pre>
	- PEL Bracket style : bs - Comment style : Bl		tinued line start with $*$ $-oxtimes$ keys are available.

<u>Description</u>	Keystroke	Function	<u>Note</u>	
Electric Keys	9		then the electrical state is active in a buffer using c-mode. toggle-electric-state (C-c C-1 or <f12> <f4> e).</f4></f12>	
#	#	(c-electric-pound ARG)	Insert a "#".	
	,	dle it specially according to the a literal or a macro, nothing sp	e variable 'c-electric-pound-behavior', which can only be nil or 'alignleft'. If a numeric ARG is pecial happens.	
()	• ()	(c-electric-paren ARG)	Insert a parenthesis.	
	If 'c-syntactic-indentation' a inside a literal.	nd 'c-electric-flag' are both no	n-nil, the line is reindented unless a numeric ARG is supplied, or the parenthesis is inserted	
			may get added or removed; see the variable 'c-cleanup-list'. nil, some newline cleanups are done if appropriate; see the variable 'c-cleanup-list'.	
{}	• { }	(c-electric-brace ARG)	Insert a brace.	
	a) If the auto-newline feat settings in 'c-hanging-lb) Any auto-newlines are	ture is turned on (indicated by braces-alist'. indented. The original line is a on, various newline cleanups	and a numeric ARG hasn't been supplied, the command performs several electric actions: "/la" on the mode line) newlines are inserted before and after the brace as directed by the llso reindented unless 'c-syntactic-indentation' is nil. s based on the settings of 'c-cleanup-list' are done.	
:	a) If the auto-newline feat 'c-hanging-colons-alist	ture is turned on (indicated by 't'.	Insert a colon. and a numeric ARG hasn't been supplied, the command performs several electric actions: "/la" on the mode line) newlines are inserted before and after the colon based on the settings in	
	, ,	· ·	llso reindented unless 'c-syntactic-indentation' is nil. colons will be "cleaned up" leaving a scope operator, if this action is set in 'c-cleanup-list'.	
:,	• ; ,	(c-electric-semi, ARG)	Insert a comma or semicolon.	
	a) When the auto-newline semi&comma-criteria' b) Any auto-newlines are	feature is turned on (indicated for how newline insertion is de indented. The original line is a	numeric ARG hasn't been supplied, the command performs several electric actions: d by "/la" on the mode line) a newline might be inserted. See the variable 'c-hanging- termined. llso reindented unless 'c-syntactic-indentation' is nil. lice list or a semicolon following a defun might be cleaned up, depending on the settings of 'c-	
Electric pairs	Type the first of a pair to inse	ert this one and its matching ch	activating the electric-pair-mode in the buffer. laracter for (), [], Ω , "" and ''. line lighter set by the pel-electric-pair-lighter is show. This defaults to $E(1)$	
Toggle electric-pair-	<f11> M-e</f11>	(electric-pair-local-mode	Toggle automatic parens pairing (Electric Pair mode) and org-mode special pair electric keys	
mode in current buffer		&optional <u>ARG</u>)	only in this buffer. With this typing (inserts the matching). Same for other pairs.With a prefix argument ARG, enable Electric Pair mode if ARG is positive, and disable it otherwise.	
Lighter:= €(+)			 Electric Pair mode is a global minor mode. When enabled, typing an open parenthesis automatically inserts the corresponding closing parenthesis, and vice versa. (Likewise for brackets, etc.). If the region is active, the parentheses (brackets, etc.) are inserted around the region instead. 	
Insert New Line(s)	active the point also moves to With PEL the default behavior command (bound to <f12> The pel-cc-newline comman</f12>	The behaviour of the RET key depends on whether the CC Mode electric mode is active or not. When it is not active it simply inserts a new line. When it is active the point also moves to the proper indentation according to the syntactic context. The following commands can also be used. • With PEL the default behaviour can be selected by customization and modified dynamically for the current buffer with the pel-cc-change-newline-mode command (bound to <f12> M-RET) see the CC-Mode behaviour control section above. • The pel-cc-newline command also aligns comments and assignment in the code block if the pel-modes-activating-align-on-return user option list includes the current major mode. The state for the current buffer can also be modified by the pel-cc-change-newline-mode command (<f11> M-RET).</f11></f12>		
Insert a new line and operate according to the currently active selected return mode. With PEL, modify behaviour with <f12></f12>	RET	(pel-cc-newline &optional N)	Insert a newline and perhaps align. With argument N repeat N times. • For newline insertion, operate according to the value of the variable 'pel-cc-newline-mode' which selects one of 3 commands (see the full description in the 3 row below): • c-context-line-break (PEL default for RET) • newline (Emacs default for RET) • electric-indent-just-newline • If 'pel-newline-does-align' is t, then perform the text alignment done by the function 'align'.	
M-RET.	Use: (c-context-line-break): Do a line break suitable to the context. • When point is outside a comment or macro, insert a newline and indent according to the syntactic context, unless 'c-syntactic-indentation' is which case the new line is indented as the previous non-empty line instead. • When point is inside the content of a preprocessor directive, a line continuation backslash is inserted before the line break and aligned approximate a comment of the cpp directive doesn't count as inside it. • When point is inside a comment, continue it with the appropriate comment prefix (see the 'c-comment-prefix-regexp' and 'c-block-comment variables for details). The end of a C++-style line comment doesn't count as inside it. • When point is inside a string, only insert a backslash when it is also inside a preprocessor directive. Use: (newline &optional ARG INTERACTIVE): Insert a newline, and move to left margin of the new line if it's blank. • With ARG, insert that many newlines. • If option 'use-hard-newlines' is non-nil, the newline is marked with the text-property 'hard'. • If 'electric-indent-mode' is enabled, this indents the final new line that it adds, and reindents the preceding line. • To just insert a newline, use M-x electric-indent-just-newline.		newline and indent according to the syntactic context, unless 'c-syntactic-indentation' is nil, in incon-empty line instead. rective, a line continuation backslash is inserted before the line break and aligned appropriately. it. appropriate comment prefix (see the 'c-comment-prefix-regexp' and 'c-block-comment-prefix' nment doesn't count as inside it. when it is also inside a preprocessor directive. wline, and move to left margin of the new line if it's blank. s marked with the text-property 'hard'. inal new line that it adds, and reindents the preceding line.	
	Use: (electric-indent-just		ewline, without any auto-indentation.	
Insert an indented line below unbroken current line See also: Indentation	• M-RET • <f11> <tab> RET</tab></f11>	(pel-newline-and-indent- below)	Insert an indented line just below current line regardless of the position of point and move point to the beginning of the next line. Does not break current line. For example if point is at the beginning, middle or end of the line it just insert a new line below the current one at the proper indentation. If pel-newline-does-align is t, it aligns several syntactic element in the current block: the comments, the assignments. You can toggle this on/off with <f11> M-RET. But lidentify modes where pel-newline-does-align is automatically activated (set to t) by adding the c-mode to the list in the pel-modes-activating-align-on-return user option.</f11>	
Insert a newline	C-j	(electric-newline-and- maybe-indent)	Insert a newline. • If 'electric-indent-mode' is enabled, that's that, but if it is *disabled* then:	
	 In programming langua 	age modes, this is the same as	Indentation is done using the value of 'indent-line-function': TAB. mmand indents to the column specified by the function 'current-left-margin'.	
Open New Line in	C-o	(c-context-open-line)	Insert a line break suitable to the context and leave point before it.	
Context See also: • <u>▼ Whitespace</u>	Sound to o	pen-line. PEL rebinds it to c-c	v', which is normally bound to C-o . See 'c-context-line-break' for the details. context-open-line for the CC modes. tt use open-line via <f12> C-o</f12>	
Open new line		(open-line N)	Insert a newline and leave point before it. With arg N, insert N newlines. • If there is a fill prefix and/or a 'left-margin', insert them on the new line if the line would have been blank.	

<u>Description</u>	<u>Keystroke</u>	Function	Note
C Comments		c behaviour: / and * to help sup	oport comments in C.
	 C supports 2 types of comments '*': Block Comments 		*/
	• '/' : Line Comments (to end of line (available since C-99)
Comment characters, wrapping long comment lines	/	(c-electric-slash ARG)	Insert a slash character. • If the slash is inserted immediately after the comment prefix in a c-style comment, the comment might get closed by removing whitespace and possibly inserting a "*". See the variable 'c-cleanup-list'. • Indent the line as a comment, if: 1. The slash is second of a "//" line oriented comment introducing token and we are on a comment-only-line, or 2. The slash is part of a "*/" token that closes a block oriented comment. • If a numeric ARG is supplied, point is inside a literal, or 'c-syntactic-indentation' is nil or 'c-electric-flag' is nil, indentation is inhibited.
See also: Filling/Justification	*	(c-electric-star ARG)	Insert a star character. • If 'c-electric-flag' and 'c-syntactic-indentation' are both non-nil, and the star is the second character of a C style comment starter on a comment-only-line, indent the line as a comment. • If a numeric ARG is supplied, point is inside a literal, or 'c-syntactic-indentation' is nil, this indentation is inhibited. • With this key being electric it becomes easy to type the following two styles of multi-line block comment:
			<pre>/* Two star</pre>
			* prefix for * multi-line * C comment. */ • When typing the '*' at the beginning of the line, it indents automatically. If another '*' is
			typed, indentation is set to allow a two-star continuation, otherwise it is placed for a single star continuation. • When auto-fill-mode is active, when you type a comment that would be longer than the line, the line is wrapped and the comment continuation string used is automatically inserted. (toggle it with <f11> RET)</f11>
Comment/un- comment ★★ See also: <u>▼ Comments</u>	M-;	(pel-c-comment-dwim ARG)	Comment line or region with // or /* */ style comments depending on the comment style currently used in the buffer. • When no marked region and no comment: • On empty line: insert comment starter at the proper indentation level. • Typed again: move it toward end of line. • On line with code: insert comment starter after the code for an end-of-line comment • With marked un-commented region: • Local Comment region with style selected by pel-c-multiline-comments user-option: • default (like comment-dwim): each line is commented with a /* */ • 1: single start multi-line comment (see example in box above) • 2: double star multi-line comment (see example in the box above) • With marked commented region: • removes the comment. • When a prefix ARG is specified, call 'comment-kill'. Else, call 'comment-indent'. • You can toggle between C-style /* */ and C++ style // comments (compatible with C since C-99) <f12> M-;</f12>
Comment/un-comment See also: Comments	С-с С-с	(comment-region BEG END & optional ARG)	Comment or uncomment each line in the region. • With just C-u prefix arg, uncomment each line in region BEG END. • Numeric prefix ARG means use ARG comment characters. • If ARG is negative, delete that many comment characters instead. • The strings used as comment starts are built from 'comment-start' and 'comment-padding'; the strings used as comment ends are built from 'comment-end' and 'comment-padding'. • By default, the 'comment-start' markers are inserted at the current indentation of the region, and comments are terminated on each line (even for syntaxes in which newline does not end the comment and blank lines do not get comments). This can be changed with 'comment-style'. • If you try this when no region is marked and the /* */ style comments is active, the comment ends on the next space, which is probably not what you want. • The command comment-dwim works better and pel-c-comment-dwim even better.
Fill current paragraph See also: Filling/Justification	• M-q • <f12> F • <m-f12> F</m-f12></f12>	(c-fill-paragraph &optional ARG)	Like <f11> t f p but handles // and /* */ style comments. • If any of the current line is a comment or within a comment, fill the comment or the paragraph of it that point is in, preserving the comment indentation or line-starting decorations (see the 'c-comment-prefix-regexp' and 'c-block-comment-prefix' variables for details). • If point is inside multiline string literal, fill it. This currently does not respect escaped newlines, except for the special case when it is the very first thing in the string. The intended use for this rule is in situations like the following: char description[] = "\ A very long description of something that you want to fill to make nicely formatted output."; • If point is in any other situation, i.e. in normal code, do nothing. • Optional prefix ARG means justify paragraph as well.</f11>
Toggle subword-mode See also: Text Modes	• <f11> t m b • <f12> M-b • <m-f12> M-b</m-f12></f12></f11>	(subword-mode &optional ARG)	Toggle subword-mode: a minor mode that treats sections of <u>camelCase</u> and <u>PascalCase</u> as distinct words. • With a prefix argument ARG, enable Subword mode if ARG is positive, and disable it otherwise.
Hide/Show comments See also: • <u>Somments</u>	<f11> ; ;</f11>	(hide/show-comments- toggle &optional START END)	Toggle hiding/showing of comments in the active region or whole buffer. • If the region is active then toggle in the region. Otherwise, in the whole buffer. • This requires the hide-commt.el package (see Somments). • PEL activates it when the pel-use-hide-commt user option is t.
			por-uso-mue-commit user option is t.

<u>Description</u>	Keystroke	Function	Note
Hungry Deletion of Whitespace	The CC mode provides two commands that can perform "hungry whitespace deletion" that can also be used in every mode. • PEL provides the convenient keys with the <f11> prefix keys for those 2 commands, available in all modes. • In modes compatible with the CC Mode (e.g. for C, C++, D, Java, Pike, etc) it is also possible to activate the Hungry Delete Mode to modify the behaviour of the simple and C-d, to perform hungry deletions. That's not currently supported in other modes. • When the Hungry Delete Mode is on, the mode-line displays a 'h' to the right of the '//l' indication of electric mode. • The Hungry Mode also activates the key prefixes below that start with C-c. They are listed but remember they are only available once the Hungry state mode is activated (and that can only be done in modes that are CC Mode compatible). • In modes derived from CC Mode you can also activate the hungry state to make standard delete commands delete hungrily, but that does not work for other modes. PEL provides the <f12> M-DEL key for those modes (like C). • Toggle hurry deletion mode of the DEL and C-d key for the current buffer with c-toggle-hungry-state (<f12> M-DEL).</f12></f12></f11>		
Delete preceding char or all preceding whitespace. See also: <u>See Cut & Paste</u>	• C-c DEL • C-c ☒ • C-c C-☒ • C-c C-backspace> • C-c C-DEL • <f11> ☒ ☒</f11>	(c-hungry-delete- backwards)	Delete the preceding character or all preceding whitespace back to the previous non-whitespace character. In terminal mode, even though C-⟨S , ⟨C-backspace⟩ and C-DEL are not available, they are mapped to the non-control key so attempting to type them end up invoking the command anyway because the first key bindings are recognized. With PEL, the ⟨f11⟩ ⟨S ⟨S binding is always available, in all modes. The other keys are only available in modes derived from the CC Mode. This prevents conflicts
	• <f11> DEL DEL</f11>		with other modes that may use the popular C-c bindings.
Delete next char or all following whitespace. See also: Cut & Paste	• C-c C-d • C-c 🔊 • C-c C-🔊 • C-c <c-delete> • <f11> 🗵</f11></c-delete>	(c-hungry-delete-forward)	Delete the following character or all following whitespace up to the next non-whitespace character. In terminal mode, even though C-ID and <c-delete> are not available, they are mapped to the non-control key so attempting to type them end up invoking the command anyway because the first key bindings are recognized. With PEL, the <f11> D binding is always available, in all modes. The other keys are only available in modes derived from the CC Mode. This prevents conflicts with other modes that may use the popular C-c bindings.</f11></c-delete>
Indentation	behaviour control section abov You can also explicitly request • The first set of commands p	ve. indentation using the commar perform syntactic indentations	-Mode state, the style and whether electric mode for some characters is active. See CC Mode ands below.
Indent current line or region	<tab></tab>	(c-indent-line-or-region &optional ARG REGION)	Indent active region, current line, or block starting on this line.
See also: • <u>Nation</u> Indentation	 Behaviour depends on syntactic-indentation mode (enabled by default but can be toggled on/off with the <f12> M-i key):</f12> With syntactic-indentation on (the default): In Transient Mark mode, when the region is active, reindent the region. Otherwise, with a prefix argument, rigidly reindent the expression starting on the current line. Otherwise reindent just the current line. This might seem strange for new Emacs users, but it ends up being very useful. You can type <tab> anywhere in the line to adjust the indentation of the current line or everything in the marked area if a block is marked.</tab> With syntactic-indentation off: <tab> always indent current line by one level</tab> C-u - <tab> or M <tab> always un-indent current line by one level.</tab></tab> Indenting marked region is done without syntax knowledge and at the same level as previous line. If you want to indent rigidly you can use: pel-indent-rigidly, bound to C-x <tab> and to <f11> <tab><tab><tab><tab><tab><tab><tab><tab></tab></tab></tab></tab></tab></tab></tab></tab></f11></tab>		
Indent lines of list after point See also: Indentation	C-M-q (indent-pp-sexp &optional ARG) Indent each line of the list starting just after point, or pretty-print it. • A prefix argument (C-u) specifies pretty-printing. Pretty-printing essentially uses more lines as it places the beginning of each list on a new line.		• A prefix argument (C - u) specifies pretty-printing. Pretty-printing essentially uses more lines
Indent current function or class	C-c C-q	(c-indent-defun)	Indent the content of the current top-level function or class. Leaves point unchanged.
Indent a region	C-M-\	(indent-region START END &optional COLUMN)	Indent each nonblank line in the region. • A numeric prefix argument specifies a column: indent each line to that column. • With no prefix argument, the command chooses one of these methods and indents all the lines with it: 1. If 'fill-prefix' is non-nil, insert 'fill-prefix' at the beginning of each line in the region that does not already begin with it. 2. If 'indent-region-function' is non-nil, call that function to indent the region. 3. Indent each line via 'indent-according-to-mode'. When a region is marked you can also use the simple <tab> to do the same when syntactic-indentation is active.</tab>
Non Syntactic Indentation	and the second s	, it's best to set pel-c-tab-wid	gards to semantics. More information on indentation is available in the \(\subseteq \) Indentation table. th and pel-c-indent-width to the same value: the first 2 commands use the value of pel-c-tab-
Insert spaces or tabs to next defined tabstop column See also: <u> </u>	M-i (tab-to-tab-stop) Insert spaces or tabs to next defined tab-stop column.		 The exact location of the next tab stop is identified by the value of the tab-stop-list and tab-width for the current buffer. With PEL, the tab-stop interval is controlled by the value of pel-c-tab-width.
Indent/Unindent rigidly See also: • ∑ Indentation • ∑ Key-Chords	• C-x <tab> • <f11> <tab> <tab> • <tab>q</tab></tab></tab></f11></tab>	(pel-indent-rigidly &optional N)	Indent rigidly the marked region or current line N times tab-width columns. If a region is marked, it uses 'indent-rigidly' and provides the same prompts to control indentation changes. If no region is marked, it operates on current line(s) identified by the numeric argument N (or if not specified N=1): N = [-1, 0, 1] : operate on current line N > 1 : operate on the current line and N-1 lines below. N < -1 : operate on the current line and (abs N) -1 lines above.
	indent-rigidly Indent all lines s If called interactively w <right>, <s-left: activ="" are="" both="" capabilities="" commands="" controlled="" of="" s-<right="" the="" these=""> indent- <right> indent- <right> indent- <left> indent- </left></left></left></left></left></left></left></left></left></left></left></left></right></right></s-left:></right>	starting in the region. with no prefix argument, activate or <s-right>. wate a transient mode where Er by the variable indent-rigidly-rigidly-right-to-tab-stop rigidly-left-to-tab-stop rigidly-left to transient mode. Left> keys indent/de-indent terval is controlled by the value the value of pel-c-tab-width for the cua-mode uses C-x, to invented.</s-right>	to the next tab-stop position, which is controlled by the tab-width user option.

<u>Description</u>	<u>Keystroke</u>	Function	<u>Note</u>	
Indent line(s) rigidly	• <f6> <tab> • <f11> <tab> c</tab></f11></tab></f6>	(pel-indent-lines &optional N)	Indent current or marked lines by N indentation levels controlled by pel-c-indent-width . • Works with point anywhere on the line.	
See also: • <u>Nation</u> Indentation	 All lines touched by the region are indented. A special argument N can specify more than one indentation level. It defaults to 1. If a negative number is specified, 'pel-unindent-lines' is used. If a region is marked, the function does not deactivate it to allow repeated execution of the command. It also modifies the region to include all characters in all affected lines. Use C-g to de-activate the region. Handles presence of hard tabs: If indent-tabs-mode is non-nil the indentation is created with a mix of hard-tabs and space characters. 			
	whitespace character on	the line are left.	n of the marked lines is replaced by the proper number of spaces. Hard tabs after first non-	
Un-indent line(s) rigidly See also:	• <backtab> • <f6> <backtab> • <f11> <tab> C</tab></f11></backtab></f6></backtab>	(pel-unindent-lines &optional N)	 Un-indent current line or marked lines by N indentation levels controlled by pel-c-indent-width. Works with point is anywhere on the line. 	
• <u>∑ Indentation</u>	If a region was marked, the characters in all affected line Handles presence of hard ta If indent-tabs-mode is no If indent-tabs-mode is nil whitespace character on	nction does not deactivate it to function does not deactivate it es. Use C-g to de-activate its: n-nil the indentation is created, any hard tab in the indentatio the line are left.	with a mix of hard-tabs and space characters. n of the marked lines is replaced by the proper number of spaces. Hard tabs after first non-	
Toggle c-eldoc mode	There are several Emacs exter	(pel-toggle-c-eldoc-mode)	riting C code. Toggle c-eldoc mode on/off.	
loggie c-eluct mode	<f11> F C C ? e</f11>	(per-toggie-c-eldoc-inode)	 The c-eldoc mode provides the C prototype information in the echo area for the function at point. It currently appears when typing a new function with its arguments inside the code. Requires <u>c-eldoc</u> external package. Activated when pel-use-c-eldoc is set to t. The extra processing may slow Emacs. This package could be improved into providing the information only on demand but a LSP-based system might be more performant anyway. I am currently looking at this to see if I can improve the performances and the feature set. c-eldoc uses the cpp command to preprocess the buffer content. 	
Open file at point	In a c-mode buffer the commode buffer the searce The command pel-cc-set-figures. Note that when using the logarithms.	The following command allow opening files from the file name taken at point (the cursor location). In a c-mode buffer the command is specialized to be more useful for C programming and has the extra capability of searching files where header files would be stored. The search method is controlled by the pel-c-file-finder-method and the pel-c-file-finder-ini-tool-name user-options. The command pel-cc-set-file-finder-ini-tool-name also provides the ability to modify that last user-option dynamically for the current session. Note that when using the Ido completion mode, it is possible to instruct Ido to use a file name at point as the basis for the file name to open. This Ido behaviour is controlled by the ido-use-filename-at-point user-option. With PEL you can control it globally or locally with <f11> f M</f11>		
Change Tool search path • (when the pel-ini-file search method is used)	<f12> <f4> C-^</f4></f12>	(pel-cc-set-file-finder-ini- tool-name &optional TOOL- NAME)	Change the value of pel-c-file-finder-ini-tool-name for C file for the current editing session. It is used to add directories to the search path used by pel-open-at-point . The directory list is taken from the key with the name specified by <i>tool-name</i> inside the pel.ini file. pel-open-at-point uses this only when the file search method identified by the pel-c-file-finder-method user-option is pel-ini-file. When used it searches pel.ini file in the directory tree identified by the presence of the file identified by pel-project-root-identifiers user-option	
Open file or web-page whose name is at point	• C-^ • <f11> f . • <m-f11> M-f M</m-f11></f11>	(pel-open-at-point &optional N)	Open the file, library or the URL, named at point, with potential line & column #s. The <u>6y</u> key-chord is available if pel-use-key-chord is non-nil. Command prefixes are supported with the key-chord. See <u>Ney-Chords</u> .	
See also: • \(\subseteq \text{ File mngt} \) • \(\subseteq \text{ Key-Chords} \) • \(\supseteq \text{ reStructuredText} \) • \(\supseteq \text{ C++} \) • \(\supseteq \text{ 1 - C++} \)	Use this command to open the header file identified by the #include statement. The various search methods (see below) support searching inside the file's directory tree or search using the directories identified by an INCLUDE environment variable or from the directories identified explicitly. This command extracts the file name to search from text at point. The file name is either surrounded by white space characters or the delimiters listed below. If embedded space(s) are allowed in the filename, then point must be located at the first of the 2 delimiter characters. These delimiter character can be any of the following: "`' ()[]{} <> ''"			
Select search method	and point can be positioned anywhere between the delimiters. If the string identifies a URL, the function opens the page in the systems' default browser. The file name extracted from the file may include glob characters (even though this is not used in a #include "" or #include <> statement but it can be used elsewhere). Otherwise the command attempts to open the file name with the specified name. If that file does not exists it then proceed to search for it. If the file name is followed by line and column numbers the point is moved to that position. The command searches for the file to open using the method identified by the pel-c-file-finder-method user-option, one of the following: • generic: the command searches for a file in the directory tree of the parent root directory. The parent root directory is a directory parent of the current file that holds a project marker file, one of the file identified in the pel-project-root-identifiers user-option. Something like .git, .hg, .project or .pel-project by default. • pel-ini-file: the command searches inside directories identified by lists defined in the pel.ini file for the project. The pel.ini file is identified using the generic method describe in the previous bullet. The pel.ini file is a .INI file format. when found, the file is opened and information inside the [file-finder] is extracted. That should contain the project-path key with a list of directories to search. If the pel-c-file-finder-ini-tool-name user-option is set to a name, that name is used as an optional key in the pel.ini file that identifies extra directories to search. • You can modify this name anytime during an editing session by typing <f12> <f4> C-^ and specifying another name. With various keys inside the</f4></f12>			
Select prompt method	pel.ini file, this allows to quickly setup different search strategies, for example to check the include paths used by various compiler chains. • environment variable name: the name of an environment variable (like INCLUDE) that holds a list of directory names to search files in. • explicit lists: two lists of directory names: one list holds the project directory names, the other hold the tool and library directory names. The lists may identify directory names indirectly via environment variables. The \$VARNAME format must be used. When several file names are found, the command lists them and prompts using the method selected by pel-prompt-read-method user-option. • The default is a very primitive function implemented by PEL. You can select a more powerful ivy prompting instead. • With ivy selected PEL will automatically set pel-use-ivy to t and ivy mode will be installed automatically when you restart Emacs. • Note that the command shows all files found by the specified search method, it does not only use the first one found. • This allows you to detect potential duplication in header file names in large include paths. • It Prompts for incomplete file names, allowing editing the find file (with completion), search for libraries files (type 1) according to current file type.			
See function docstring for more info.	 Select target window: Without argument: If file is already opened in a window, move point to that window and to the line column coordinates if specified following the file name at point. If no window holds that file, select the target window based on the number of editable windows in frame: if 1, split that window and use the new window, if 2: use the other window, if 3 or more, use the current window. With numeric argument N: N < 0: create a new window and use that. N = 0: use the 'other' (the next) window. N = 1, 3, 7or above (excluding 8, 9 and 10): select the target window based on the number of editable windows in frame: if 1 window: split that window and use the new window, if 2 windows: use the other window, if 3 or more windows: use the current window. N is 8: up, 2: down, 4:left, 5:current, 6:right. N is 9: open the file in the system's browser, open a directory name at point with directory browsing (eg. macOS Finder, Windows Explorer). N is 10: open the URL at point in the system's browser. Selecting Minibuffer, inexistent or dedicated window is not allowed. 			

Description	<u>Keystroke</u>	Function	<u>Note</u>
Tempo skeletons for C	PEL creates key bindings to with the same key bindings	invoke the skeletons in the su for equivalent concepts (such	as file header block) as much as possible.
See also: •	PEL creates key bindings to invoke the skeletons in the supported major modes, using the same key prefix sequence for each mode: <f12> <f12>, with the same key bindings for equivalent concepts (such as file header block) as much as possible. **Several aspects of the PEL Emacs Lisp Source Code Style is controlled by the user options inside the pel-c-code-style group. This group can be edited with <f12> <f12> <f12> <f12> <f21> for a C mode buffer and include the following options: **pel-c-skel-module-header-block-style: allows selecting a user-define module-header comment block. **pel-c-skel-norment-with-2-star: **pel-c-skel-insent-file-timestamp: **pel-c-skel-doc-markup: **pel-c-skel-doc-markup: **pel-c-skel-doc-markup: **pel-c-skel-file-section-titles: **pel-c-skel-insent-function-section-titles: **pel-c-skel-insent-function-sections: **pel-c-skel-insent-function-sections: **pel-c-skel-insent-function-sections: **pel-c-skel-function-section-titles: **pel-c-skel-function-name-on-first-column: identifies whether return type is located on the same line as function name or just above. **pel-c-skel-with-license: **pel-c-skel</f21></f12></f12></f12></f12></f12></f12>		
<u>▼ Customize</u> PEL C	with the standard tempo-me <f12> <f12> <f2></f2></f12></f12>	ode keys C-c M-f and C-c (pel-customize-pel &optional OTHER-WINDOW)	M-b or some other keys like C-c . and C-c ,. Customize PEL C skeleton layout. If OTHER-WINDOW is non-nil (use C-u), display in another window.
Insert a file header	<f12> <f12> h</f12></f12>	(pel-elisp-file-header)	Insert a file description block. Distinguish between code files and header files. • Prompts for the file purpose. • For header files, include guard is inserted if requested by customization. • The layout of the entered text is controlled by user options. It is possible to create a user-specified skeleton this command will used instead of the one provided by PEL. • See examples of generated outputs located in example/templates/c/files repo directory. • Access the customization buffer by typing: <f12> <f12> <f2></f2></f12></f12>
Insert #define	<f12> <f12> d</f12></f12>	(pel-c-define)	Insert a C pre-processor #define statement. If there is text between the beginning of the line and point, insert the statement on the next line, otherwise insert it on the current line, even if there is text after point (to allow inserting it before the name of the symbol to define).
Insert #include <.h>	<f12> <f12> i</f12></f12>	(pel-c-include-lib)	Insert a C pre-processor #include <> statement to include a library file. • If there is text between the beginning of the line and point, insert the statement on the next line, otherwise insert it on the current line. • If there is text after point, insert a new line to place that text on the next line. • The .h extension is written between the angle brackets and point left right before the period. The next tempo mark is placed at the end of the line (so C-c · move point there).
Insert #include ".h"	<f12> <f12> I</f12></f12>	(pel-c-include-local)	Insert a C pre-processor #include "" statement to include a local file. • If there is text between the beginning of the line and point, insert the statement on the next line, otherwise insert it on the current line. • If there is text after point, insert a new line to place that text on the next line. • The .h extension is written between the angle brackets and point left right before the period. The next tempo mark is placed at the end of the line (so C-c · move point there).
Insert a function definition with comment block	<f12> <f12> f</f12></f12>	(pel-c-function)	Insert a C function definition code and comment template. • The command prompts for the function name and its purpose. • You can hit return both prompts to specify no text; in that case a tempo skeleton marker is left at the location where the text must be inserted and point is left at the first one. • If you enter a function name, it must be a valid C function name (as far as the syntax is concerned). However leading and trailing whitespace is accepted and trimmed and dash characters ('-') are automatically replaced by underscores (') for convenience. • If an invalid name is specified it is erased and you are prompted again. Use M-p to bring the old value back. • Prompts for function and purpose maintain separate histories. Use M-p and M-n to navigate in the histories at the prompt. You can also use the <up>and <down> keys. • The style of the code inserted is controlled by the user options inside the pel-c-code-style group and the various C style element controls of the CC-mode. • Use C-g to cancel at any prompt. See some examples in the PEL manual.</down></up>
Toggle pel-tempo- mode	<f12> <f12> SPC</f12></f12>	(pel-tempo-mode &optional ARG)	Toggle PEL tempo mode on/off. PEL tempo mode activates C-c . and C-c , as well as to C-c C and C-c C-, key bindings to navigate across tempo mark hot-spots. When pel-tempo-mode is active the pel-tempo-mode lighter (‡) is shown on the status bar. The second set are only available when Emacs runs in graphics mode. When a skeleton is inserted via the execution of one of the pel-rst commands, the pel-tempo-mode is automatically activated.
Jump to next tempo mark	• C-c M-f • C-c . • C-c C	(tempo-forward-mark)	Jump to the next mark in 'tempo-back-mark-list': the location where code must be updated inside the inserted skeleton. • These key key bindings are only available when pel-tempo-mode is active.
Jump to previous tempo mark	• C-c M-b • C-c , • C-c C-,	(tempo-backward-mark)	Jump to the previous mark in 'tempo-back-mark-list': the location where code must be updated inside the inserted skeleton. • These key binding are only available when pel-tempo-mode is active.

Description	<u>Keystroke</u>	Function	<u>Note</u>
Tempo Template Tag	<f12> <f12> <f12></f12></f12></f12>	(tempo-complete-tag	Look for a tag and expand it.
Insertion		&optional SILENT)	Instead of using the <f12> <f12> key bindings above, you can type the template name (shown in the title column like "if", "case", etc) completely or partially and then hit <f12> <f12> <f12>. A completion buffer opens up if the template name is incomplete (or empty in which case the buffer lists all available template names). Select the template name and hit RET.</f12></f12></f12></f12></f12>
			 Emacs expands the template. All the tags in the tag lists in 'tempo-local-tags' (this includes 'tempo-tags') are searched for a match for the text before the point. The way the string to match for is determined can be altered with the variable 'tempo-match-finder'. If 'tempo-match-finder' returns nil, then the results are the same as no match at all. If a single match is found, the corresponding template is expanded in place of the matching
			string. If a partial completion or no match at all is found, and SILENT is non-nil, the function will give a signal. If a partial completion is found and 'tempo-show-completion-buffer' is non-nil, a buffer containing possible completions is displayed. Since only one template is available in emac-lisp-mode, the usefulness of this command is
Incorting gods			limited here.
Inserting code Insert Parentheses		_	s. See also above: <f12> M-e activates electric pair: typing (inserts the matching)</f12>
insert Parentneses	M- ((insert-parentheses &optional ARG)	 For C: insert a parenthesis pair '()', leaving point after open-paren. A positive ARG encloses the following ARG sexps in parenthesis if they are balanced. A negative ARG encloses the preceding ARG sexps instead. No argument is equivalent to zero: just insert '()' and leave point between. PEL makes parens-require-spaces buffer local and set it to nil in C mode buffers, allowing the use of this command to insert the argument parentheses following a function (and without placing a space between the function name and the opening parenthesis. If region is active, insert enclosing characters at region boundaries. This command assumes point is not in a string or comment.
Marking	Emacs provides the following	command to quickly mark the	whole content of the current function. More mark commands exists, see the <u>Narking</u> table.
Mark the complete	C-M-h	(c-mark-function)	Mark complete function.
function body See also: Marking			 Put mark at end of the current top-level declaration or macro, point at beginning. If point is not inside any then the closest following one is chosen. Each successive call of this command extends the marked region by one function. A mark is left where the command started, unless the region is already active (in Transient Mark mode).
			As opposed to C-M-a and C-M-e, this function does not require the declaration to contain a brace block.
Getting Syntactic Information	Use the following commands	to extract syntactic information	from the source code.
Display name of current function	• C-c C-z • <f12> f • <m-f12> f</m-f12></f12>	(c-display-defun-name &optional ARG)	Display the name of the current CC mode defun and the position in it. • With a prefix arg, push the name onto the kill ring too.
Search Support			case is often used. Using superword-mode helps searching. change this use the <f11> t <f2> to access the customize buffer.</f2></f11>
Toggle superword- mode See also: • ∑ Text Modes • ∑ Search/Replace	• <f11> t m p • <f12> M-p</f12></f11>	(superword-mode &optional ARG)	Toggle superword-mode: a minor mode that treats snake_case as one word. In C '_' are treated as part of words. • With a prefix argument ARG, enable superword mode if ARG is positive, and disable it otherwise.
Highlighting blocks	show-paren-mode, which h	ighlights the parens that match	seful modes to highlight blocks of (), {}, and []. tes the one before or after point. ter highlighted with the same colour.
Toggle show-paren mode on/off	• <f12> M-9 • <m-f12> M-9</m-f12></f12>	(show-paren-mode &optional ARG)	Toggle visualization of matching parens (Show Paren mode). • With a prefix argument ARG, enable Show Paren mode if ARG is positive, and disable it otherwise.
See also: <u>∑ Highlight</u>	• <f11> h (</f11>		Show Paren mode is a global minor mode. When enabled, any matching parenthesis is highlighted in 'show-paren-style' after 'show-paren-delay' seconds of Emacs idle time.
Enable/Disable coloured highlight of	• <f12> M-r</f12>	(rainbow-delimiters-mode &optional ARG)	Highlight nested parentheses, brackets, and braces with different colours according to their depth.
nested blocks (),{},[] See also: Fighlight	• <m-f12> M-r • <f11> h R</f11></m-f12>	aoptional And)	Customize the depth and colours with M-x customize-group rainbow-delimiters
See also. <u>// Frightinght</u>			Requires: rainbow-delimiters.el PEL activates this when the pel-use-rainbow-delimiters user option is set to t.
Navigation in C	This current list below describ	e the specialized commands o	nly. See the others inside <u>▼ Navigation</u>
By definitions	Move to the definition of funct	ion or type at point. See ∑ Xre	of for more information to activate the various engines that support cross referencing for C code.
Find definition of identifier at point	M	(xref-find-definitions IDENTIFIER)	Grab symbol at point and move cursor to its definition. • If there are more than one match, prompt in the *xref* buffer. • To search for a symbol entered manually, type C-u M
See also: <u>∑ Xref</u>			With dumb-jump this performs a search using ag, ripgrep or git grep if available.
Go back to where M was last issued	М-,	(xref-pop-marker-stack)	 Pop back to where M was last invoked. Marker depth is controlled by the xref-marker-ring-length user option.
By functions By structures	Jump over comments.	function definition blocks or strice	ucture definition blocks. Ter closing brace and show-paren-mode is on, the matching parentheses are highlighted.
Forward to start of next top level function or struct	<f6> <down></down></f6>	(pel-beginning-of-next- defun &optional SILENT DONT-PUSH_MARK)	Move forward to the beginning of the next function or type definition. Move point before the function type or the struct or typedef keyword. Beeps if does not find beginning of next function unless SILENT is non-nil. If the beginning of next function is found, push the start location to the mark ring unless DONT-PUSH_MARK is non-nil.
	<f12> <down></down></f12>		 Move back to previous position with M⁻. Shift marking is available. With <f6> and <f12> hit Shift after function key, before cursor key.</f12></f6> This command complements what end-of-defun does. It moves forward but not to the end of the function definition (like end-of-defun) but to the beginning of the function definition, which is often what users of other editors expect.
Forward to end of current top-level function or struct.	С-М-е	(c-end-of-defun &optional ARG)	Move forward to the end of a top level declaration. • With argument, do it that many times. Negative argument -N means move back to Nth preceding end.
	• C-M- <end> • <f6> <right></right></f6></end>	(end-of-defun &optional ARG)	Move forward to the end of next function or type definition. With argument, do it that many times. Negative argument -N means move back to Nth preceding end of defun. Shift marking is available. With <f6> and <f12> hit Shift after function key, before cursor key.</f12></f6>
	<f12> <right></right></f12>		This command moves to the end of the next top-level function. It skips nested functions.

<u>Description</u>	<u>Keystroke</u>	Function	<u>Note</u>
Backward to beginning of current top-level function or struct	С-М-а	(c-beginning-of-defun &optional ARG)	Move backward to the beginning of a function or type definition. With a positive argument, move backward that many functions or structures. A negative argument -N means move forward to the Nth following beginning.
<u> </u>	• C-M- <home> • <f6> <up></up></f6></home>	(beginning-of-defun &optional ARG)	Move backward to the beginning of function or type definition. Move point before the function type or the struct or typedef keyword. With ARG, do it that many times. Negative ARG means move forward to the ARGth following beginning of defun.
	<f12> <up></up></f12>		→ Shift marking is available. With <f6> and <f12> hit Shift after function key, before cursor key. ⚠ This command moves to the beginning go the next function or of the same nesting level of the current location. It skips the functions that are more deeply nested.</f12></f6>
Backward to end of previous top level function or struct	<f6> <left></left></f6>	(pel-end-of-previous-defun &optional SILENT DONT- PUSH_MARK)	Move backwards to the end of the previous function or type definition. Beeps if does not find end of previous function unless SILENT is non-nil. If the end of previous function is found, push the start location to the mark ring unless DONT-PUSH_MARK is non-nil.
	<f12> <left></left></f12>		 Move back to previous position with M−`. Shift marking is available. With <f6> and <f12> hit Shift after function key, before cursor key.</f12></f6> In some cases it fails to detect the end of the previous block and fails.
By blocks	Move across C statements	and C scope blocks, or any gro	oup of (), [], {} or <> blocks.
By List element	Move to the end or the be	eginning of a block	
Backward block/list See also: Navigation	С-М-р	(backward-list &optional ARG)	Move backward across one balanced group of parentheses. This command will also work on other parentheses-like expressions defined by the current language mode. With ARG, do it that many times. Negative arg - N means move forward across N groups of parentheses. This command assumes point is not in a string or comment. C-M-p: Shift marking is available in graphics mode, not in terminal mode.
Move block backward See also: • Navigation	• C-M-b • C-M- <left> • C-[C-b • Esc C-b • Esc C-<left></left></left>	(backward-sexp &optional ARG)	Move backward across one balanced expression (sexp). • With ARG, do it that many times. Negative arg -N means move forward across N balanced expressions. This command assumes point is not in a string or comment. • C-M-b : ➤ Shift marking is available in graphics mode, not in terminal mode. • C-M- <left> : ➤ Shift marking works with this command. • ⚠ With PEL: if you want to use Esc C-<left> binding you must ensure that pelwindmove-on-esc-cursor user option is set to nil, otherwise it does something else. • C-M-<left> does not work on Windows, but H-<left> works. ⑤ Several Linux distros map C-M-<left> to desktop workspace operation. In that case you can either use another key binding or change Linux key binding in Systems->settings->keyboard->shortcuts to prevent it from using that key sequence.</left></left></left></left></left>
Forward block/list	C-M-n	(forward-list &optional	Move forward across one balanced group of parentheses.
See also: Navigation		ARG)	 This command will also work on other parentheses-like expressions defined by the current language mode. With ARG, do it that many times. Negative arg -N means move backward across N groups of parentheses. This command assumes point is not in a string or comment. C-M-n : ► Shift marking is available in graphics mode, not in terminal mode.
Move block forward See also: • Navigation	• C-M-f • C-M- <right> • C-[C-f • Esc C-f • Esc C-<right></right></right>	(forward-sexp &optional ARG)	Move forward across one balanced expression (sexp). • With ARG, do it that many times. Negative arg -N means move backward across N balanced expressions. This command assumes point is not in a string or comment. • C-M-f : → Shift marking is available in graphics mode, not in terminal mode. • C-M- <right> : → Shift marking works with this command. • ⚠ With PEL: if you want to use Esc C-<right> binding you must ensure that pel-windmove-on-esc-cursor user option is set to nil, otherwise it does something else. • C-M-<right> does not work on Windows, but H-<right> does. ■ Several Linux distros map C-M-<right> to desktop workspace operation. In that case you can either use another key binding or change Linux key binding in Systems->settings->keyboard->shortcuts to prevent it from using that key sequence.</right></right></right></right></right>
in/out of blocks	Move in or out of C scope b	blocks, or any group of $(), [], \{\}$	or < > blocks.
Backward Up/outside sexp hierarchy See also: • Navigation	• C-M-u • C-M- <up> • C-[C-u • Esc C-u • Esc C-<up></up></up>	(backward-up-list &optional ARG ESCAPE- STRINGS NO-SYNTAX- CROSSING)	Move backward out of one level of parentheses or nested blocks. This command will also work on other parentheses-like expressions defined by the current language mode. With ARG, do this that many times. A negative argument means move forward but still to a less deep spot. Mith PEL: if you want to use Esc C- <up> binding you must ensure that pel-windmove-on-esc-cursor user option is set to nil. C-M-u: Shift marking is available in graphics mode, not in terminal mode. C-M-<up> irr Shift marking works with this command. C-M-<up> does not work on Windows, but H-<up> does.</up></up></up></up>
Forward Up/outside	C-M-]	(up-list &optional ARG ESCAPE-STRINGS NO-	Move forward out of one level of parentheses or nested blocks.
sexp hierarchy See also: <u>Navigation</u>		SYNTAX-CROSSING)	 This command will also work on other parentheses-like expressions defined by the current language mode. With ARG, do this that many times. A negative argument means move backward but still to a less deep spot.
Down/inside sexp/ block See also:	• C-M-d • C-M- <down> • C-[C-d</down>	(down-list &optional ARG)	Move forward down one level of parentheses. This command will also work on other parentheses-like expressions defined by the current language mode. With ARG, do this that many times. A negative argument means move backward but still go
• <u>∑ Navigation</u>	• Esc C-d • Esc C- <down></down>		down a level. This command assumes point is not in a string or comment. Mith PEL: if you want to use Esc C- <down> binding you must ensure that pel-windmove-on-esc-cursor user option is set to nil. C-M-d : ► Shift marking is available in graphics mode, not in terminal mode. C-M-<down> : ► Shift marking works with this command. C-M-<down> does not work on Windows, but H-<down> does.</down></down></down></down>
By statements	Move to beginning /end of sta		
Go to beginning of statement (backward)	м-а	(c-beginning-of-statement &optional COUNT LIM SENTENCE-FLAG)	Go to the beginning of the innermost statement. With prefix arg, go back N - 1 statements. If already at the beginning of a statement then go to the beginning of the closest preceding one, moving into nested blocks if necessary (use C-M-b to skip over a block). If within or next to a comment or multiline string, move by sentences instead of statements.
Go to the end of statement (forward)	М-е	(c-end-of-statement &optional COUNT LIM SENTENCE-FLAG)	Go to the end of the innermost statement. With prefix arg, go forward N - 1 statements. Move forward to the end of the next statement if already at end, and move into nested blocks (use C-M-f to skip over a block). If within or next to a comment or multiline string, move by sentences instead of statements.

Description Keystroke **Function** Emacs supports navigation through C preprocessor conditional statements, allow expansion of preprocessor macros, hiding pre-processor statements that would not be executed with the Hide-ifdef mode. There are also external packages that provide extra support. All commands provided by Emacs and C Preprocessor external packages are listed below. They can be used for editing C and C++ source code. PEL provides a key hydra to help navigate trough preprocessor directives and to hide/show code areas based on preprocessor logic and defined variables.

* The key sequences that start with <f12> <f7> open the pel-\(\subseteq\)c-preproc Hydra allowing further hydra keys to be typed without any prefix. Requires the hydra external package APEL activates when the pel-use-hydra user option is set to t. ж -UUU:**--F1 a c file.c All (4,0) (C/*la Ifdef WK Fly 2 Anzu Abbrev) -----C preprocessor: Move to # Vars Other Open the C preprocessor <u>hydra</u> with <f12> <f7> #: toggle mode ?: Show state followed by on of the d: define hvdra kevs: C-p: begin R: toggle RO C-n: end H: hide C-u: up S: show D: Save list h: hide block C: Clear all s: show block Navigate across pre-The following commands move point across the #if, #else, #elif and #endif C pre-processor conditional statements. 🕵 Customizations: 'c-macro-preprocessor' specifies the pre-processor command used by Emacs. The default depends on the operating system. conditionals • <f12> # p Move to previous (pel-pp-prev-directive) Move point to previous preprocessor directive. # <f12> <f7> p preprocessor directive (pel-pp-next-directive) Move to next • <f12> # n Move point to next preprocessor directive. preprocessor * <f12> <f7> n directive (c-up-conditional COUNT) Move back to the containing preprocessor conditional, leaving mark behind. Move up in the pre-• C-c C-u A prefix argument acts as a repeat count. With a negative argument, move forward to the processor conditional * <f12> <f7> C-u end of the containing preprocessor conditional.
"#elif" is treated like "#else" followed by "#if", so the function stops at them when going backward, but not when going forward. Move to the previous • C-c C-p (c-backward-conditional Move back across a preprocessor conditional, leaving mark behind. * <f12> <f7> C-p COUNT &optional TARGET-A prefix argument acts as a repeat count. pre-processor With a negative argument, move forward across a preprocessor conditional. conditional block DEPTH WITH-ELSE) Move to the next pre--forward-conditional Move forward across a preprocessor conditional, leaving mark behind. * <f12> <f7> C-n COUNT &optional TARGETprocessor conditional · A prefix argument acts as a repeat count. With a negative argument, move backward across a preprocessor conditional.
 If there aren't enough conditionals after (or before) point, an error is signaled. DEPTH WITH-ELSE) • "#elif" is treated like "#else" followed by "#if", except that the nesting level isn't changed when tracking subconditionals. (c-macro-expand START Expand C macros in the region, using the C preprocessor. **Expand Pre-**• C-c C-e FND SUBST) Normally display output in temp buffer, but prefix arg means replace the region with it.
 If the user option 'c-macro-prompt-flag' is non-nil prompt for arguments to the <f12> # # • <M-12> # # preprocessor (e.g. '-DDEBUG -I ./include'), otherwise use 'c-macro-cppflags'. (c-backslash-region FROM Insert, align, or delete end-of-line backslashes on the lines in the region Insert/align or delete C-c C-\ TO DELETE-FLAG &optional end-of-line backslash With no argument, inserts backslashes and aligns existing backslashes LINE-MODE) With an argument, deletes the backslashes. · This function does not modify blank lines at the start of the region. If the region ends at the start of a line and the macro doesn't continue below it, the backslash (if any) at the end of the previous line is deleted. · You can put the region around an entire macro definition and use this command to conveniently insert and align the necessary backslashes 📰 Customizations: The backslash alignment is done according to: 'c-backslash-column', 'c-backslash-max-column' and 'c-auto-align-backslashes', Show state • <f12> # ? (pel-pp-show-state) Show state of C preprocessor control modes. preprocessor modes * <f12> <f7> ? Hide-ifdef mode suppresses the display of code that the C preprocessor wouldn't pass through.

• It supports complete C/C++ expression and precedence. **Hide-ifdef Mode** hide/show code It scans for new #define symbols and macros.
It hides blocks of code that would not be include in the expanded file according to the state of pre-processor symbols that are maintained inside the controlled by Cpreprocessor Hide-ifdef environment: the hide-ifdef-env association list Emacs variable (use <f1> v to see the content of Emacs variables). See <u>N Help/Info</u>. • When hiding code, the hidden code is marked by ellipses (...). 🔼 Be cautious when editing near ellipses, since the hidden text is still in the buffer, and you can move the point into it and modify text unawares. You can make your buffer read-only while hide-ifdef-hiding by setting hide-ifdef-read-only user-option to a non-nil value.
 Access it hide-ifdef customization group with <f12> # <f3> • You can toggle this variable with hide-ifdef-toggle-read-only (with C-c @ C-q) or with <f12> # r or <f12> <f7> R. With PEL, the commands are reachable via the <f12> prefix keys can also be reached via the <M-f12> and the <f11> SPC c prefix keys. ★ The key sequences that start with <f12> <f7> open the pel-∑c-preproc Hydra allowing further hydra keys to be typed without any prefix. Requires the hydra external package 2 PEL activates when the pel-use-hydra user option is set to t. Several customize user option variables affect how the hiding is done: to change, execute: M-x customize-group hide-ifdef or type <f12> # <f3> 'hide-ifdef-env' An association list of defined symbols for the current project. The list holds the following forms:

• (SYMBOL) is used when the SYMBOL is defined (but without explicit value)

• (SYMBOL . VALUE) when the symbol is defined with an explicit value. · 'hide-ifdef-define-alist' An association list of pre-defined symbol lists. Use 'hide-ifdef-set-define-alist' to save the current 'hide-ifdef-env' and 'hide-ifdef-use-define-alist' to set the current 'hide-ifdef-env' from one of the lists in 'hide-ifdef-define-alist'. · 'hide-ifdef-lines' Set to non-nil to not show #if, #ifdef, #ifndef, #else, and #endif lin · 'hide-ifdef-initially' Indicates whether 'hide-ifdefs' should be called when Hide-Ifdef mode is activated. 'hide-ifdef-read-only' Set to non-nil if you want to make buffers read only while hiding. After 'show-ifdefs', read-only status is restored to previous value. Toggle features to hide/show #ifdef blocks (Hide-Ifdef mode). (hide-ifdef-mode &optional Toggle the Hide-Ifdef • <f12> M-# • <M-f12> M-# With a prefix argument ARG, enable Hide-Ifdef mode if ARG is positive, and disable it mode ARG) * <f12> <f7> # otherwise. Hide-lfdef mode is a buffer-local minor mode for use with C and C-like major modes. When enabled, code within #ifdef constructs that the C preprocessor would eliminate may be <f11> SPC c M-#

hidden from view.

<u>Description</u>	<u>Keystroke</u>	Function	<u>Note</u>
Toggle read-only mode when text is hidden	• C-c @ C-q • <f12> # r * <f12> <f7> R</f7></f12></f12>	(hide-ifdef-toggle-read- only)	Toggle read-only: toggle 'hide-ifdef-read-only'. Note that you can make the file read only by default when hide-ifdef is hiding text, by setting the 'hide-ifdef-read-only' user option to t.
Toggle shadowing of hidden text.	• C-c @ C-w • <f12> # w * <f12> <f7> W</f7></f12></f12>	(hide-ifdef-toggle- shadowing)	Toggle shadowing. When shadowing is on, text that would be hidden is "shadowed" instead: it is displayed with the shadow.face (normally something dim, all depending of the theme used).
Hide content of all #ifdef statements that would not be included	• C-c @ h • <f12> # H • <m-f12> # H * <f12> <f7> H</f7></f12></m-f12></f12>	(hide-ifdefs &optional NOMSG)	Hide the contents of some #ifdefs. Assume that defined symbols have been added to 'hide-ifdef-env'. The text hidden is the text that would not be included by the C preprocessor if it were given the file with those symbols defined. With prefix command presents it will also hide the #ifdefs themselves.
	• <f11> SPC c # H</f11>		Turn off hiding by calling 'show-ifdefs'.
Restore all hidden into view	• C-c @ s • <f12> # S * <f12> <f7> S</f7></f12></f12>	(show-ifdefs)	Cancel the effects of 'hide-ifdef': show the contents of all #ifdefs.
Hide part of current block that would not be included	• C-c @ C-d • <f12> # h * <f12> <f7> h</f7></f12></f12>	(hide-ifdef-block &optional ARG START END)	Hide the ifdef block (true or false part) enclosing or before the cursor. • With optional prefix argument ARG, also hide the #ifdefs themselves.
Show all parts of the current #ifdef block	• C-c @ C-s • <f12> # s * <f12> <f7> s</f7></f12></f12>	(show-ifdef-block &optional START END)	Show the ifdef block (true or false part) enclosing or before the cursor.
Set a variable to a specific value	• C-c @ d • <f12> # d * <f12> <f7> d</f7></f12></f12>	(hide-ifdef-define VAR &optional VAL)	Define a VAR to VAL (default 1) in 'hide-ifdef-env'. • This allows hiding the block inside #ifndef VAR by executing the command hide-ifdefs.
Undefine a variable	• C-c @ u • <f12> # u * <f12> <f7> u</f7></f12></f12>	(hide-ifdef-undef START END)	Undefine a VAR • This allows hiding the blocks inside #ifdef VAR by executing the command hide-ifdefs.
Save the symbol environment list into a named list	• C-c @ D • <f12> # D * <f12> <f7> D</f7></f12></f12>	(hide-ifdef-set-define-alist NAME)	Save the state of the current hide-ifdev-env to a list with the specified NAME for later re-use. The value is saved inside the 'hide-ifdef-define-alist' variable. The list is not saved to disk. You may want to pre-create the value for a given project and store it inside your local directory variables for example.
Use a named symbol environment list	• C-c @ U • <f12> # U * <f12> <f7> U</f7></f12></f12>	(hide-ifdef-use-define-alist NAME)	Use an already saved symbol list with the specified NAME and store it inside the 'hide-ifdef- env' to be used in the editing session. Set 'hide-ifdef-env' to the define list specified by NAME.
Clear the complete list of #define'd symbols inside 'hide- ifdef-env'	• C-c @ C • <f12> # C * <f12> <f7> C</f7></f12></f12>	(hif-clear-all-ifdef-defined)	Clears all symbols defined in 'hide-ifdef-env'. • It will backup this variable to 'hide-ifdef-env-backup' before clearing to prevent accidental clearance.
Evaluate pre- processor macro	• C-c @ e • <f12> # e * <f12> <f7> e</f7></f12></f12>	(hif-evaluate-macro RSTART REND)	Evaluate the macro expansion result for the active region. If no region active, find the current #ifdefs and evaluate the result. Currently it supports only math calculations, strings or argumented macros can not be expanded.
Rendering markup embedded in comments	The following commands are used to create images from specific markup code embedded inside C source code comments. This can be useful when using these markup languages to describe UML diagrams or finite-state machines for example. You can also use Graphviz, see M Graphviz Dot		
Preview UML diagram from plantUML source in current plantUML region of commented source code See also: M PlantUML	<f12> u</f12>	(pel-render-commented-plantuml PREFIX &optional POS)	Render the PlantUML markup embedded in current mode comment. • Use region if identified otherwise use PlantUML block at point. • Uses prefix (as PREFIX) to choose where to display it: • 4 (when prefixing the command with C-u) -> new window • 16 (when prefixing the command with C-u C-u) -> new frame. • else -> new buffer • This can be used inside buffer using any major mode, when PlantUML markup is embedded inside source code comment. Use this in source code to describe your code architecture with PlantUML markup, then generate the UML rendering by moving point inside the PlantUML block and issuing this command. Requires the plantuml-mode external package, activated by pel-use-plantuml user

Emacs & C - References

Document	Notes
GNU emacs - CC Mode Manual	
GNU Emacs Manual - Styles	
Emacs BSD/Allman Style with 4 Space Tabs?	
Emacs: Linux Kernel Style but with Allman/BSD Style Braces?	
Emacs Wiki - Indenting C	
Indent preprocessor directives as C code in emacs	Does not fully address the way I want to have multi-indentations for pre-processor
elisp code - ppindent.el	Implements pre-processor indentation with the # always in the first column. Not yet exactly what I want.
company-mode ; Modular in-buffer completion framework for Emacs	