LISP in Google Sheets with named functions	Author: zick (https://github.com/zick)										
遊び方	How to use										
1. Googleアカウントでログインしてこのページを開く	1. Sign in to your Google Account, and open this page										
2. メニューの [ファイル] - [コピーを作成] を選択	2. Select [File] - [Make a copy] from the menu										
3. [コピーを作成] をクリックして編集可能なコピーを作る	3. Click [Make a copy] to create a editable copy										
4. コピーしたファイルの [REPS] シートに移動	4. Open the copied file, and move to sheet [REPS]										
5. A列(A2以降)に好きな式を入力	5. Type your expressions to column A (below A2)										
仕組み	How does it work										
このLISPインタプリタは「名前付き関数」で作られています	This LISP intepreter is implemented with "named functions"										
[データ] - [名前付き関数] を選択するとすべてが分かります	You can see everything from [Data] - [Named functions]										
(編集可能なコピーで選択する必要があります)	(You can see it only in a editable copy)										
Supported functions / special forms	(see also https://github.com/zick/ZickStandardLisp)										
QUOTE	You can use ' sign like '(A B C)										
IF											
LAMBDA	This make a lexical closure										
DEFUN											
SETQ	This makes a global variable when the variable doesn't exist										
CAR											
CDR											
CONS											
EQ											
ATOM											
NUMBERP											
SYMBOLP											
+	Two arguments only										
-	Two arguments only										
*	Two arguments only										
I											
MOD											

input	output	internal state																			
*** TYPE YOUR EXPRESSIONS BELOW THIS CELL ***		;value=1;value=27;head	-28;car=[1:27]27:26	(26.\$MOD)1:25(25.2	4[24:5][1:23]23:22[2	2.\$1[1:21]21:20]20	\$-[1:19]19:18[18:\$+[1:	7 17:16 16:\$SYMBO	P[1:15]15:14]14:\$NUI	IBERP[1:13]13:12[1	2:\$ATOM[1:11]11:10[	10.\$EQ[1.9[9.8]8.\$CI	DNS[1:7]7:6[6:\$CDF	1.5 5:4 4.\$CAR	3[3:2[2:\$T]1:0[0:0]:	:dr= 27:25 26:\$MOD 2	5:23(24:\$/)23:21(2	2:\$1 21:19 20:\$- 1	9:17 18:\$+ 17:15	6:\$SYMBOLP[15:13]14	\$NUMBERP[13:11]12:
(car '(a b c))	A	;value=\$A;value=\$CAR;	value=35;value=0;h	ead+36;car+(35:29)	4:33 33:\$QUOTE 32	29 31.\$C 30.\$8 2	9 \$A 28 \$CAR 1 27 27	26 26:\$MOD 1:25 25	24 24:5  1:23 23:22 22	\$1 1:21 21:20 20:5-	1:19[19:18[18:\$+[1:17	17:16 16:\$SYMBOL	P[1:15]15:14]14:\$N	IMBERP[1:13]13	12 12:\$ATOM 1:11 1	11:10 10:\$EQ 1:9 9:8 8	\$CONS[1:7]7:6[6:	SCDR(1:5 5:4 4:\$	CAR(1:3(3:2(2:\$T)	1.0 0.0 ;cd= 35:0 35:0 2	8:34 34:0 34:28 33:32 3
(cdr '(a b c))	(BC)	;value=38;value=\$CDR;	value=43;value=0;h	ead=44;car=[43:37]+	2:41 41:\$QUOTE 40	:37 39.\$C 38:\$B 3	7:\$A(36:\$CDR(35:29)3	33 33:\$QUOTE 32:2	9 31:\$C 30:\$B 29:\$A 2	8.\$CAR[1:27]27:26	26 \$MOD[1:25]25:24]	24:\$([1:23]23:22]22:	3" 1:21 21:20 20:\$- 1	19[19:18]18:\$+[1	17 17:16 16:\$SYME	IOLP 1:15 15:14 14:\$8	IUMBERP[1:13[13	12 12:\$ATOM 1:	11 11:10 10:\$EQ 1	9 9:8 8:\$CONS 1:7 7:6	6:\$CDR 1:5 5:4 4:\$CAR
cons 1 (cons 2 (cons 3 ())))	(123)	;value=61;head=62;car=	(61:#1)60:59(59:#2)	58:57 57:#3 56:0 55	#3 54 #2 53 #1 52:4	S[51:48]50:0[49:#3	48:\$CONS 47:#2 46:\$	CONS 45:#1 44:\$CON	IS 43:37 42:41 41:\$QL	OTE 40:37 39:\$C 3	8.\$8(37.\$A(36.\$CDR)	35:29(34:33)33:\$QU	OTE 32:29 31:\$C 30	\$8 29.\$A 28.\$CA	R(1:27)27:26(26:\$M	ODJ1:25 25:24 24:\$\[1	23 23:22 22:\$1 1:2	1]21:20]20:\$-[1:1	9[19:18[18:\$+]1:17	17:16[16:\$SYMBOLP[1	:15 15:14 14:\$NUMBER
defun fact (n) (if (eq n 0) 1 (* n (fact (- n 1)))))	FACT	;value=\$FACT;value=1;v	slue-85;head-86;c	ar=[1:85[85:84]84:\$I	ACT 83:\$FUNARG	2:1 81:66 80:72 7	9:74 78:75 77:#1 76:\$1	75.\$-[74.\$FACT]73.5	N[72:\$1]71:#1[70:67]6:	#0(68:\$N(67:\$EQ)	6:\$1F)65:64)64:\$N)63	\$FACT 62.\$DEFUN	61:#1 60:50 50:#2 5	:57 57:#3 56:0 5	5#3 54#2 53:#1 52	46 51:48 50:0 49:#3 4	8.\$CONS 47.#2 46	\$CONS 45#1 4	4:\$CONS[43:37]43	41 41:\$QUOTE 40:37 3	99:\$C 38:\$B 37:\$A 36:\$
fact 5)	120	yalue=#120;value=#120	;value-\$1;value-94	value=143;head=1-	4;car=[143:#24]142	#6 141:#2 140:#1	139.#1 138.#0 137.#0	36:135 135:134 134:	N[133:#0[132:#1]131:	#1 130:#1 129:#0 12	8#1 127:126 126:12	[125:\$N]124:#1]123	#1 122:#2 121:#2 1	0:#0 119:#2 118:	117 117:116 116:\$N	115:#2 114:#1 113:#3	112:#3 111:#0 110:	#3 109:108 108:1	07 107:\$N 106:#3	105:#1 104:#4 103:#4 1	02:#0 101:#4 100:99 95
(defun gen (n) (lambda (m) (setq n (+ n m))))	GEN	;value=\$GEN;value=1;v	alue=162;head=163	car+[1:162]162:161	161:\$GEN 160:\$FU	NARG 159:1 158:	48 157:151 156:153 1	5.\$M 154.\$N 153.\$+	152.\$N 151.\$SETQ 15	0:149[149:\$M]148:\$	LAMBDA 147:146 14	:\$N 145:\$GEN 144:	\$DEFUN[143:#24]1-	2:#6 141:#2 140:	W1 139:W1 138:W0 13	7:#0[136:135]135:134	134:\$N 133:#0 13	2.#1 131:#1 130:#	F1[129.W0]128.W1[	27:126 126:125 125:\$N	[124:#1]123:#1[122:#2]
setq x (gen 100))	«EXPR»	;value=173;value=1;valu	e=175;head=176;cs	e=[1:175]175:174]1	4:\$X(173:\$FUNARO	172:171 171:170	170:169 169:\$N 168:#	00 167:165 166:#100	[165:\$GEN[164:\$X]16	3.\$SETQ[1:162]162	161 161:\$GEN 160:\$	UNARG 159:1 158:	148 157:151 156:15	[155:\$M]154:\$N	153:\$+ 152:\$N 151:	SETQ 150:149 149:\$	M[148:\$LAMBDA[1	47:146 146.\$N 1	45.\$GEN 144.\$DE	FUN 143:#24 142:#6 14	1:#2[140:#1]130:#1]138
(x 10)	110	;value=#110;value=#110	yalue-#110;head-	184;car=[183:#10]18	2:#100 181:180 180	179 179:\$M 178:4	10 177:#10 176:\$X 1:1	5 175:174 174:\$X 17	3.\$FUNARG[172:171]	71:170 170:169 16	9:\$N 168:#100 167:16	5 166.#100 165:\$GE	N 164.\$X 163.\$SET	2 1:162 162:161	161:\$GEN 160:\$FUI	VARC[159:1]158:148[1	57:151 156:153 1:	55.\$M[154:\$N[15	3:\$+ 152:\$N 151:\$	SETQ[150:149]149.\$M[	148:\$LAMBDA 147:146
(x 90)	200	;value=#200;value=#200	value=#200,head=	192;car=[191:#90]1:	0.#110 189:188 188	187 187:\$M 186:	P90 185:#90 184:\$XQ18	#10 182:#100 181:1	90 180:179 179:\$M 17	3#10 177:#10 176:5	X[1:175]175:174]174:	\$X[173:\$FUNARG[1	72:171 171:170 170	169[169:\$N]168:	100(167:165)166:#1	00 165:\$GEN 164:\$X	163.\$SETQ[1:162]	162:161 161:\$GE	N 160:\$FUNARG	159:1 158:148 157:151	156:153 155:\$M 154:\$2
(x 300)	500	yalue=#500;yalue=#500	value-#500;head-	200;car=[199:#300]	198:#200 197:196 19	6:195 195:\$M 194	#300 193:#300 192:\$3	191:#90[190:#110[18	9:188 188:187 187:\$N	[186:#90]185:#90[1	84:\$X(183:#10(182:#1	00 181:180 180:179	179:\$M[178:#10]17	#10 176:\$30 1:17	5 175:174 174.\$X 17	3:\$FUNARG 172:171	171:170 170:169	169 \$N  168 #100	167:165 166:#100	165.\$GEN 164.\$X 163:	\$SETQ[1:162[162:161]
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	ue=#500,value=#50	0,value=#500,head=	200,car= 199.#30	0 198:#200 197:196 19	195 195:\$M 194:#30	0 193:#300 192:\$X(19	1:#90[190:#110]189	188 188:187 187:\$M	186 #90 185 #90 184	:\$X[183:#10]182:#1	0[181:180]180:1	79 179:\$M 178:#10	77:#10[176:\$X[1:175]	175:174 174:\$X 17	13.\$FUNARG 172	:171 171:170 170	169[169:\$N[168:#100]16	67:165 166:#100 165:\$I
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue-#500;value-#	500;value=#500;head=	00;car+[199:#300]19	3.W200 197:198 196:19	5 195:\$M 194:#300	193:#300 192:\$30 191	#90 190:#110 189:1	88 188:187 187:\$M	88:#90[185:#90]	184:\$30[183:#10]182	#100 181:180 180:179	[179:\$M]178:#10]	177:#10[176:\$X]1	:175 175:174 174:	\$X[173:\$FUNARG[172:1	171 171:170 170:169 16
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	ne=\$EMPTY-INPUT;val	e=#500;value=#500;	relue-#500;head-200	car+[199:#300[198:	R200[197:198[196:198	[195:\$M]194:#300[1	93:#300[192:\$X[191	P90[190:#110[18	2:188 188:187 187:\$	M[186:#90]185:#90[18	4.\$X 183.#10 182	#100 181:180 18	0:179[179:\$M]178	#10[177:#10[176:\$X]1:1	175 175:174 174:\$X 173
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	F500; value=#500; va	lue=#500;head=200;d	ar=[199:#300[198:#2	100 197:196 196:196	195:\$M(194:#30	0 193:#300 192:\$X 1	91:#90[190:#110[189:	188 188:187 187:\$	M[186.#90[185:#	00 184:\$X 183:#10	(182#100 181:180 180:	179[179:\$M[178:#10]17
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=#	500,value=#500,valu	e-#500;head-200;	e-[199.#300]198	#200[197:196]196:1	195 195:\$M 194:#300	193 #300 192:\$X 1	91:#90[190:#110]	189:188[188:187]	87:\$M(186:#90(185:#90	0 184:\$X 183:#10 182:#
	NIL	yalue=0,value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=8	00;value=#500;v	slue-#500;head-20	0;car= 199:#300 198:#	200[197:196]196:	195 195:\$M 194:4	300 193:#300 192	\$30,191,#90,190,#110,11	89:188 188:187 187:\$M
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-#500;value-#500;val	ue-#500;head-20	0;car+[199:#300]	198 #200 197:196	196:195 195:\$M 194:#3	00 193:#300 192:\$X 19
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-#500;value-#50	0;value=#500;hea	d+200;car+[199:#300[19	98.#200 197:196 196:19
	NIL	yalue=0,value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ralue2+;value+\$	MPTY-INPUT;value	=0;value2=;value=\$Ef	/PTY-INPUT;value	-0;value2+;value	-\$EMPTY-INPUT;	value+#500,value+#500	value=#500,head=200,
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	ne=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ralue2+;value+\$	EMPTY-INPUT;value	=0;value2=;value=\$Et	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0;value2=;value=5	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0,value2=;value=5	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0,value2=;value=5	SEMPTY-INPUT;value=
	NIL	yalue=0,value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2+;value+\$	MPTY-INPUT;value	=0;value2=;value=\$Et	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0;value2=;value=6	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	);value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ralue2+;value+\$	EMPTY-INPUT;value	=0;value2=;value=\$Et	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0,value2=;value=6	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0,value2=;value=5	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2+;val	e=\$EMPTY-INPUT;val	e=0;value2=;value=5	EMPTY-INPUT;value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-0;value2=;value	-\$EMPTY-INPUT;	value=0,value2=;value=5	SEMPTY-INPUT;value=
	NIL	;value=0;value2=;value=	\$EMPTY-INPUT;va	lue=0;value2=;value	SEMPTY-INPUT;va	ue=0;value2=;val	e=\$EMPTY-INPUT;val	e=0,value2=;value=5	EMPTY-INPUT/value=	;value2=;value=\$E	MPTY-INPUT;value=0	value2=;value=\$EM	PTY-INPUT;value=0	ratue2=;value=\$	MPTY-INPUT;value	-0;value2=;value=\$Ef	/PTY-INPUT;value	-0,value2-;value	-\$EMPTY-INPUT	value=0,value2=;value=6	SEMPTY-INPUT;value=
	NIL	valued value2wvalues	SEMPTY-INPUT:vai	hand value?w value	SEMPTY.INPLITY	neethyshis/wysh	www.SEMPTY.INPLIT-vol	e=0.volue2=volue=5	EMPTY.INPLITYON OF	Typha 2 wyshae 4F	MPTY.INPLITYMINED	value2= value=\$FM	PTY.INPLIT-valued	rahas2w-vahase4	MPTY.INPLITyphie	=0.volue2=volue=\$F8	/PTY-INPUT:value	-0.value2-value	-SEMPTY-INPUT:	value=0.value2=.value=5	SEMPTY.INPLIT values