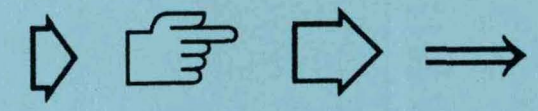
LISP Pointers



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Dear Colleague,

This issue is coming to you complements of I.N.R.I.A. and MCC. I never knew what MCC stood for until I needed the full name for the back cover. Isn't Lisp Pointers a good source of information? Texas Instruments has offered (along with I.N.R.I.A.) to sponsor our fourth issue. That means we still need sponsors for issues number 5 and 6. If you think your company might be interested, please contact me for details.

I continue to be very pleased with the quality of the articles we are receiving. Thanks are due both to the authors and to our technical editor, Jon L. White. JonL not only works with the authors, he also puts in a good amount of time hunting them down. I believe I have seen his nose twitch when in the presence of an author with an unpublished paper. We hope that if you're a reader, you are enjoying the results of his hunt. And, if you're a writer, we hope that he's going to catch you someday. I think you'll find it a good experience to work with someone who wants to help you create a really fine paper.

I refer you to Susan Ennis' column, The Key of Lisp. Surely, Susan can't be left in such a minor key. Aren't there any Lisp musicians out there?

I came very slowly to realize that Letters to the Editor don't come in the postal mail anymore. So this issue contains my admittedly slow realization that the section is really Communications to the Editor. It's somewhat easier on me if you add a note to the bottom of any electronic mail that should be printed in this section. Sometimes I can be dense. The section also contains Dick Gabriel's solution to his puzzles of the previous issue (thank you, Dick), and Ralph London's corrections to a correction.

You'll also notice that we have some art work for this issue. Claire Albahae is a computer graphic artist who enjoys making little pointer figures. The first one is her standard pointer. The second one was made just for us. After talking with David Moon, I have my heart set on seeing some cartoons come out of our community. An obvious cartoon for garbage collection is a garbage truck. We were imagining what one might use to illustrate incremental garbage collection. One suggestion was a dog under the dinner table. Anyone out there do cartoons?

Sincerely,

Mary S. Van Deusen

Mary S. Van Deusen, Editor

Received: from SAIL.STANFORD.EDU by IBM.COM on 07/16/87 at 17:16:50 PDT
Date: 16 Jul 87 1716 PDT
From: Dick Gabriel <RPG@SAIL.STANFORD.EDU>
Subject: Puzzle Solutions, Lisp Pointers
To: maida@IBM.COM

Mary, here are the solutions for the two puzzles in the last Lisp Pointers:

Puzzle 1:

```
(defun f (i)
 (labels ((g (n n-1 n-2 m m-1 m-2)
           (let ((k (* n-1 m-1)))
            (values (+ (* n m) k)
                    (+ (* n m-1) (* n-1 m-2))
                    (+ k (* n-2 m-2)))))
          (h (i)
           (cond ((zerop i) (values 1 0 0))
                 ((= i 1) (values 1 1 0))
                 ((evenp i)
                  (multiple-value-bind (n n-1 n-2)
                   (h (truncate i 2))
                   (g n n-1 n-2 n n-1 n-2)))
                 (t (multiple-value-bind (n n-1 n-2)
                     (h (1- i))
                     (g 1 1 0 n n-1 n-2))))))
  (values (h i)))))
```

When given a non-negative number i, F computes Fib(i). The key to understanding the program is to see that the following identity holds:

$$\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}^n = \begin{bmatrix} Fib(n+1) & Fib(n) \\ Fib(n) & Fib(n-1) \end{bmatrix} = Q(n),\ 0<n \text{ def}$$

using MACSYMA notation to represent matrices. This identity can be easily proven using induction. Notice that

Let a = Fib(n+1)
b = Fib(n)
c = Fib(n-1)
d = Fib(m+1)
e = Fib(m)
f = Fib(m-1)

Then

$$\begin{bmatrix} a & b \\ b & c \end{bmatrix} \begin{bmatrix} d & e \\ e & f \end{bmatrix} = \begin{bmatrix} ad+be & ae+bf \\ bd+ce & be+cf \end{bmatrix} = \begin{bmatrix} Fib(n+m+1) & Fib(n+m) \\ Fib(n+m) & Fib(n+m-1) \end{bmatrix}$$

because

```
[ a b ]  [ d e ]
[     ]  [     ] = Q(n)Q(m) = Q(n+m)
[ b c ]  [ e f ]
```

Notice that ae+bf = bd+ce.

Therefore, we can represent this matrix as three values, and we can define a matrix multiplication routine for these sorts of matrices. This multiplication routine is called G in the LABELS form.

Notice that Q(2n) = Q(n)Q(n) and Q(2n+1) = Q(2n)Q(1)

The LABELS function named H encodes these identities; notice H calls G a number of times proportional to LOG base 2 of its argument.

Puzzle 2:

```
(defun f (n)
 (labels ((f (n m)
           (if (= n m)
               n
               (let ((h (truncate (+ n m) 2)))
                (* (f n h) (f (+ h 1) m))))))
  (f 1 n)))
```

This program computes factorial when given a positive integer. The LABELS function named F computes the product of the numbers from n through m (inclusive). That is,

(f n m) = n*...*m.

The call to truncate in the inner F divides the range approximately in half on each recursive call. So, if h is in [n m),

(f n m) = (f n h)*(f h+1 m).

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Date: Sat, 13 Jun 87 10:36 CDT
From: hi.hollan@MCC.COM
Subject: Lisp Pointers
To: maida@ibm.com
cc: hi.hollan@mcc.com
Message-ID: <870613103658.2.HOLLAN@blacks.hi.mcc.com>

One type of thing I would like to see in the newsletter is more discussion of issues underlying the use of particular lisp constructs and examples of good and bad uses. A major problem for novices learning lisp is not understanding the constructs of the language but of coming to understand when one should and should not want to use them. Also I would very much like to see some discussions by the implementers of various lisp-based systems of the design decisions behind the implementation. Here I mean the kinds of things that one can never get from reading the actual code (why it was done this way rather than some other way, what alternative approaches were considered and rejected, and how issues of the language influenced those decisions). A number of years ago I attended an advanced lisp class taught by dlw in which he talked about some of the design issues behind parts of their software. I found it quite interesting and could imagine that other readers of lisp pointer would find this kind of discussion both interesting and useful.

Another suggestion would be some articles on styles of use of various lisp systems. A sort of snapshot and commentary of some typical episodes of use of different systems. What I imagine is something akind to a brief look over the shoulder of how a master hacker solves some problem.

Jim Hollan, Director
Human Interface Laboratory, MCC

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    id AA16790; Wed, 24 Jun 87 14:02:46 PDT
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    id AA08389; Wed, 24 Jun 87 14:05:21 PDT
Message-Id: <8706242105.AA08389@tekchips.TEK.COM>
To: Maida@ibm.com
Cc: ralphl%tekchips.tek.com@RELAY.CS.NET
Subject: Marechal & 1941 Explanation
Date: 24 Jun 87 14:05:19 PDT (Wed)
From: ralphl%tekchips.tek.com@RELAY.CS.NET

This is in response to David Wallace who "corrected one of our fillers that attributed a quotation on airplanes made in 1941 to Marechal. Since Marechal died in 1929, he is presumably not the actual source. Does anyone know who is?" The source is correct; "1941" should be "1911."

The origin of the fillers in the first issue was a local newsletter circulated by a Portland, Oregon, real estate agent. When Mary van Deusen requested filler material, I remembered them and sent them to her as electronic mail, requesting anonymity. The year shown for the airplane prediction was 1911 which I now know I mistyped as 1941. Sometime later I discovered the book, "The Experts Speak," by Christopher Cerf and Victor Navasky. Over 300 of its pages are full of such quotations including all of the fillers. Below are shown the subtle changes between the texts in the newsletter and in the book. Note that the person is Foch; Marechal is his title. Even the book's index entry for Foch showing p. 243 is wrong; it should be 245! The source is given elsewhere in the book as "quoted from [redacted]Coronet,' August 1914." I find it most interesting that Wallace took the date as correct and assumed that the person, therefore, was wrong. In fact, several people have independently noted that in 1941 such a quote would already be wrong and could not be a "prediction." It makes a beautiful example of incorrect error correcting. I can hardly wait to see what new errors are generated by this explanation.

Ralph London, Tektronix, Inc., Beaverton, Oregon

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The fillers revisited:

"I think there's [there is] a world market for about five computers." [Remark attributed to] Thomas J. Watson, IBM Chairman [Chairman of the Board of International Business Machines], 1943

"With over 50 foreign cars already on sale here, the Japanese auto industry isn't likely to carve out a big slice of the U.S. market for itself." Business Week, 1958 [August 2, 1968]

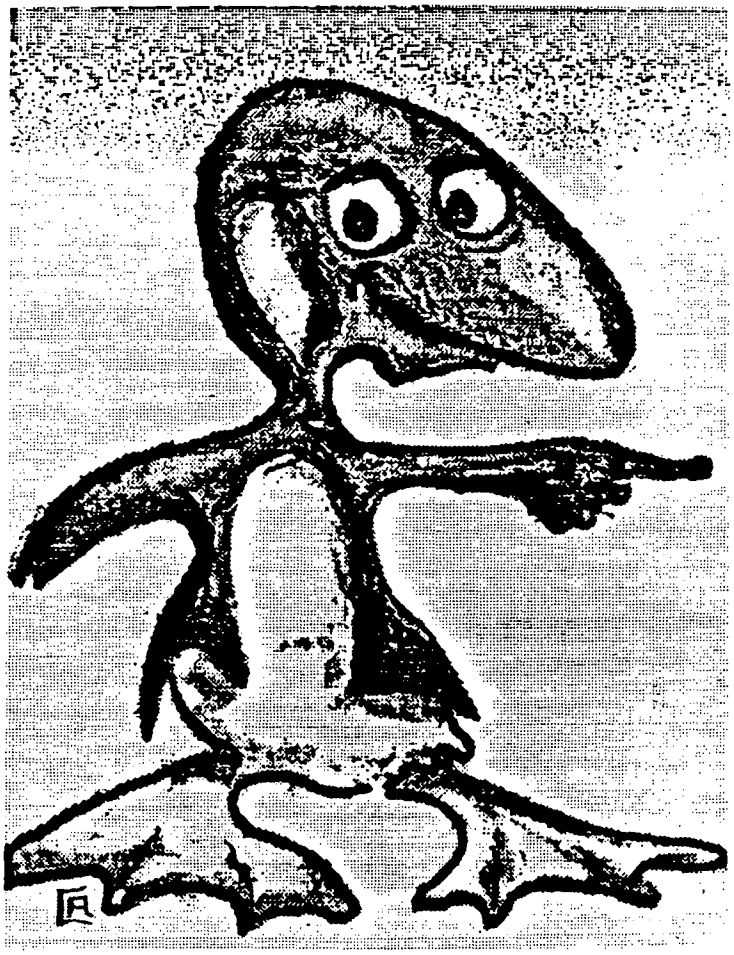
"TV [Video] won't be able to hold on to [onto] any market it captures after the first six months. People will soon get tired of staring at a plywood box every night." Daryl F. Zanuck, Head of 20th Century Fox [Studios], [c.] 1946

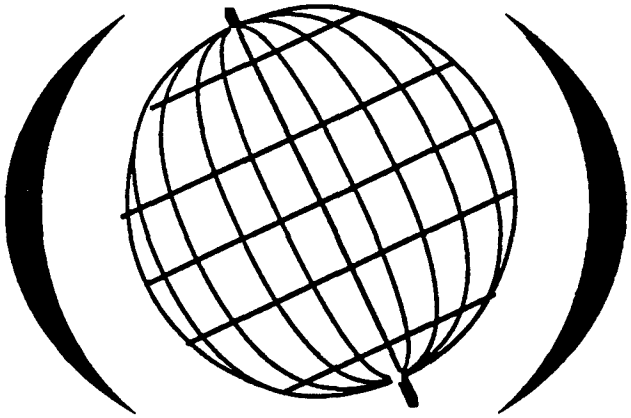
"By 1980, all [▮]power[’] (electric, atomic, solar) is likely to be virtually costless." Henry Luce, founder and publisher of Time, Life, and Fortune [magazines, The Fabulous Future], 1956

"[[]1930 will be[]] a splendid employment year." U.S. Department of Labor, [New Year's Forecast, December] 1929 [I.e., in the book there are brackets around "1930 will be."]

"My imagination refuses to see any sort of submarine doing anything but suffocating its crew and floundering [founder] at sea." H. G. Wells, [British writer and historian, Anticipations,] 1902

"[[]Airplanes[]] are interesting toys, but of no military value." France's Marshall Foch, [Marechal Ferdinand Foch, Professor of Strategy at and Commandant of the Ecole Superieure de Guerre,] 1911 [In the book there are brackets around "Airplanes" and acute accents over the e in Marechal and the first e in Superieure.]





Int'l News

Collected by Christian Queinnec, LITP, Paris FRANCE

ISO Efforts

I promised in the previous Lisp-Pointers issue to report ISO efforts but ISO did not change very much these four last months. The only point is the ballot result within SC22 concerning the need of a Lisp standardisation. Well, it is now official: with unanimity, we agree we need it ! But work will only begin when TC97 orders SC22 to undertake it. And that requires a new ballot within TC97. SC22 will then ask all national standardisation organisations to elect its representatives to the ISO-Lisp Working Group.

The time schedule I introduced is now inaccurate. The first official ISO Working Group meeting will take place in Paris in February 1988, from 22 to 25; and the first Draft Proposal for SC22 may be ready near the end of 1989.

I expect great results from these days. The Working Group has first to settle its own internal organisation and to debate the general principles it will follow. Since its work will interest a lot of people involved in Lisp and to outline this first international meeting, I propose to include in it a two-day workshop:

International Workshop on Lisp Evolution and Standardisation
Paris, February 1988, 22 and 23

IWoLES'88 will be dichotomized. IWoLES will cover the topics related to Lisp standardisation such as Semantics, Validation Suite, Macro Mechanism ... but also, as suggested by John McCarthy in his "Notes on Improving Lisp" [Lisp Pointers, Vol 1, #2, June-July 1987], improvements propositions. The idea is that a good standard is needed but I do not want to roughly freeze my favorite language that is to say to cut it from research. The standard must become a firm basis to expose and discuss advanced topics and has to know (and to let know) the width of the gaps it creates. IWoLES will also provide users with vital informations on portages, adaptability problems and processor specialities awareness.

For a first issue, IWoLES'88 will not be organised as an usual conference. I only plan the following items

- Tutorials on various controverted features that are likely ro raise problems,
- Expositions or progress reports on national or international standardisation.

All papers will be selected in a very informal way. More precise informations will be put on the net.

1988, the thirtieth birthday of Lisp, will be the year of Lisp !

Miscellaneous

Standardization groups hold regular meetings and you are still invited to join them. ANSI X3J13 just met from June 29 to 1st of July in Boston (MA). The French Expert Group of AFNOR will hold its next meeting on September, 28 in Paris. The next Eu_Lisp group meeting is scheduled on September, 21 and 22 in Brussels (Belgium).

Other News

"ISO efforts" contribution to these columns is likely to be short these days. So let us discover new topics of interest. I plan to describe non-US laboratories working on Lisp and I strongly encourage them to send me a one- or two-page presentation. I shall naturally begin with the Laboratoire d'Informatique Théorique et de Programmation (to which I belong) in the next issue. Meanwhile for those who collect foreign Lisp books, here are the genuine french ones (I do not include translations). I hope german or japan or other readers to resume this list with their own national production. That bibliography also exists in BIBTEX format.

French Books on Lisp: A complete Bibliography

Cayrol Michel	*Le Langage Lisp*	Cepadues Editions, Toulouse, 1983
Farreny Henry	*Lisp*	Masson, Paris, 1984
Girardot Jean-Jacques	*Les Langages et les Systèmes Lisp*	EDItests, Paris, 1985
Kiremitdjian Georges, Roy Jean-Pierre	*Lire Lisp, Le Langage de l'Intelligence Artificielle*	CEDIC-Nathan, Paris, 1985
Queinnec Christian	*Langage d'un autre type: Lisp*	Eyrolles, Paris, 1982
Queinnec Christian	*Lisp Mode d'Emploi*	Eyrolles, Paris, 1984
Wertz Harald	*Lisp, une Introduction à la Programmation*	Masson, Paris, 1985

From Randall D. Beer, Case Western Reserve University

****

Seeger's Law

"Anything in parentheses can be ignored."