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TKO JE NAPISAO KOMPAJLER ZA LISP?

Povijest Lispa 13.



Razmjena vještina
Hacklab u mami
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McCarthy, History of Lisp, History of Programming Languages conference, 1978-81

"The first attempt at a compiler was made by **Robert Brayton**, but was unsuccessful. The first successful LISP compiler was programmed by **Timothy Hart** and **Michael Levin**. It was written in LISP and was claimed to be the first compiler written in the language to be compiled. "

ali ...

**Blair, F. , "The Structure of the LISP Compiler",
Unpublished paper, IBM Research Center, 1971 (?).**

“In the course of my work in algebraic symbol manipulation, I have had the pleasure to implement a Lisp system with compiler for several S/360 ... I had the opportunity to study the history and structure of the lisp compiler. It is my intention to pass along some of that information. The first Lisp compiler was written by **Robert Brayton** with the assistance of **David Park**, in SAP for the 704, That compiler was started in 1957 (?) and was working in 1960 by which time **Brayton** left MIT. During that interval of time a Lisp compiler written in Lisp was implemented by **Klim Maling** but that compiler was apparently dropped. The argument advanced was that , **Brayton's** being written in assembly language, would obviously be faster. Difficulties in maintenance developed when **Brayton** left...”

Brayton?



Robert K. Brayton

Diplomirao **1956**, nastavio studije na MIT, Radio u IBM, Berkeley University.

Nije u wikipediji.

Istraživao dizajn procesora.
Napisao velik broj knjiga i članaka.

*"The first attempt at a compiler was made by Robert Brayton, but was **unsuccessful**."*

I have seen this comment several times (in Wikipedia I think) but did not ever spend the time to address this. This is a quite unfair comment.

I entered MIT in Fall 1957 and got my PhD in June 1961, and from the Fall of 1958 til June 1961 I worked on the LISP compiler.

When I left in June 1961 it was fully working and compiled everything it was ever asked to do. I think the above comment was made because the code I left was not very well documented (if at all, since I can't really remember the details). It was written in assembly so it was probably very hard to maintain. It was unsuccessful in this sense only.

The second quote is much more accurate. I have added some corrections that make it more accurate (in italics).

"The first Lisp compiler was written by Robert Brayton with the assistance of David Park, in SAP for the 704, That compiler started in 1957 (*1958*) and was (fully) working in 1960 (*1961*) by which time Brayton left MIT. During that interval of time a lisp compiler written in Lisp was implemented by Klim Maling but that compiler was apparently dropped. (*I am not sure it ever worked fully*) The argument advanced was that, Brayton's being written in assembly language, would obviously be faster. Difficulties in maintenance developed when Brayton left the project. After Brayton and Maling, Timothy Hart and Michael Levin wrote a compiler in Lisp which was distributed with the 704 Lisp 1.5 system."

I worked in the AI group during all 4 years of my PhD work. I got my PhD in Mathematics in the area of ordinary differential equations - nothing to do with AI and LISP. In 1957 there was no LISP, which as far as I know was invented by McCarthy during the summer of 1958, since before then I had not heard of it.

In Fall 1958, when McCarthy came back from summer travels, he started everyone working on various pieces of implementing LISP.

Klim Maling and I undertook the writing of a LISP compiler - I in assembly language and Klim in LISP.

I don't think Klim's compiler was fully operative. If it was, then it could compile itself and thus exist in assembly. So the argument that it was abandoned because it was obviously slower than my compiler does not hold water. Actually, the idea of a LISP compiler written in LISP is a much more compelling idea than one written in assembly.

There is a chapter (appendix?), which I wrote for the LISP 1 programmer's manual. I remember looking at it a few years ago, but I can't find it now. As I remember, it gave a pretty good picture of the status of my compiler in March 1960.

Hope this information helps.

Bob

Poglavlje 4.6. Lisp I priručnika. (ožujak 1960.)

Kompajler je pseudo-funkcija *comdef* dostupna funkciji *apply*.
Primjerice,

```
comdef[EVAL,FF].
```

Rezultat poziva funkcije je lista uspješno kompajliranih funkcija.
Kompajliranje u tri koraka:

1. Kompajler stvara (“generira”) SAP u obliku liste

```
( ( ,LXD,0,4) , ( ,TXI,G0007,4,-1) , ( ,TRA,*+5) , ... )
```

Simbole koji počinju sa **G** stvorio je kompajler.

2. Kompajler prevodi SAP u binarni program

3. Mijenja se asocijacijska lista pridružena imenu funkcije.

Prilikom kompajliranja funkcija mora se voditi računa o redoslijedu kompajliranja. Ako se funkcije međusobno pozivaju, valja ih kompajlirati u istom pozivu funkcije `comdef`.

Verzija `comdef`, pseudofunkcija `compile` prihvaća i LABEL-izraze.

```
compile[(LABEL, name, (LAMBDA(...)))]
```

LISP I je podržavao `(GO, (COND, ...))` ali kompajler nije. Treba “ući” sa `GO` ispod `COND` ako je moguće. Bilo je još sličnih ograničenja.

Brayton, AIM-023, Trace-printing for compiled programs