Symbolic Computation in 1974–1976 in Japan

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First, this article surveys the beginning of symbolic computation in Japan which had been led by Prof. Eiich Goto with his paper "Monocopy and Associative Algorithms in an Extended Lisp" named HLISP (for Hash-LISP) written in 1974 (*we can get it from Web*) and the first application of the HLISP to the computation of so-called "Feynman graphs in the QED (= Quantum Electro-Dynamics)" by the speaker in 1975. Reading the Goto's paper, the readers will understand that the HLISP saves the memory as much as possible by avoiding the appearance of duplicated lists by hashing, and they will also think that Prof. Goto was stingy. However, if the readers know that the computer we had used at that time for "large computations" was very restricted in the memory (about 1 Mega-words memory), they will understand why Goto deviced to save the memory severly. In addition, we survey very brie y how the computer algebra had been popularized in 1980's in Japan.

Secondly, this article introduces that Prof. Goto is an unbelievably excellent and fantastic **inventor** (he often called himself not a researcher but an inventor). One influential example is a new electron-beam method to evolve the LSI (Large Scale Integrated-circuit) to the VLSI (V means Very), invented in 1975. The speaker will introduces several of such hardware invented by Goto, as well as a Lisp machine.