A Systematic Approach to Developing Web Virtual Programming language

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Preface

The progress of the IT innovation does not know that you stay, and advance by the force that was far beyond our expectation, consciousness.

Trial generally national as a ruler measuring an engineer, a researcher, the status of the school teacher including the writer.

There is men (national qualification). As the (IT connection) only national qualification about information Ministry of Economy, Trade and Industry independence administrative law.

There is person "information processing promotion mechanism" "National Examination for Information Processing Technicians".

While these national examinations that began by a revision of the National Examination for Information Processing Technicians improve both the level and the examinee numbers.

There is, However, so that, for the learner, understanding of significance and the positioning was slightly vague for the final examination seems. As guide of the information processing engineer particularly basic from a learner of the basic National Examination for Information Processing Technicians.

Tend to be placed; from the learner of information processing utilization ability test system. The qualification that advanced on the extension line includes a placed feeling. Ministry of Economy, Trade and Industry Japan information processing.

With association of development, the standard curriculum system of Institute for central information education (CAIT), it is High Engineer.

A thing equivalent to a practiced hand includes high National Examination for Information Processing Technicians, and the final examination is started; IT passport.

Recognition of the high National Examination for Information Processing Technicians

increases; and the corner of work front peculiar to an information processing technology examination.

It may be said that I am coming for a share injury. Receive such a reality; and a fruit case study like in these examinations.

Problems to ask knowledge increase, the learner practices it as well as the knowledge that accorded with CAIT curriculum.

For the purpose of experience and the intellectual power that can support the each situation being found, and meeting it.

We wrote this report around Web Programming.

As for the labor saving of duties, the times called the tool of the efficiency, the information processing technology becomes a thing of the past; is a fruit in a corporate strategy.

In late years duties targeted for the information processing increase, and speed of the processing comes to be required;

Person to accept a demand newly because there is a limit by a demand, the correspondence only in the next information system section.

The securing of materials is demanded. Therefore one which is an on-site section using the data which were really handled.

Of the demand the need that I design the information system, and user section builds as for the birth, the information processing engineer.

I become a promoter promoting information system in coping engineers from the situation of the user.

It is intended to make so-called program and system and is utilized the information system more in companies.

I promote and think about construction, use of new information system, and it is an information processing engineer to practice.

1.1 A storage device and register of Web Virtual Programming Language

Asembler languages are used well in NTT which is a person of telecommunications business of the first kind, a major carrier including KDDI.

It is language, and it may be said that it is the most basic language in every language. This language without even if it is said that it is impossible to understand structure such as a computer, the communication without it being understood, being exaggeration.

I carry it on my back. Asembler Web Virtual Programming language which was thought about

for National Examination for Information Processing Technicians there in our country, Ministry of Economy, Trade and Industry.

It is the origin which I developed. The Asembler language can say that it is usually a fault to vary according to the kind of the computer.

In addition, , Web Virtual Programming language is not a computer language peculiar to a certain maker. Therefore, which realizes it.

 there is not the pewter; but of the first kind information processing examination.

It is for basic training to become one of the words.

It is a language. where ,Web Virtual Programming language is really usable by duties.

There is not the pewter, but (Web Virtual Programming language simulator is excluded) is temporary.

I think about a thing named computer Web Virtual Programming language

is a majority like a computer of the normal.

I have the storage device (memory) consisting of cells.

A program and data are stored to this storage device.

In addition, be called the second from the zeroth to each cell most.

Address (address) is on and performs designation of the address.

I take the contents stored away by it.

I can start it. The concept of such a storage device is a train.

At the point where is greatly different from a conventional "abacus" in a child calculator.

There is it, and "firstly is memory, and come"; There will be it.

Because Web Virtual Programming language is a virtual computer ;This is program using Asemebler Web Virtual Programming language.

Trouble great at a point studying Web Virtual Programming language in this device (in this simulation) which therefore realize Web Virtual Programming language (on a real PC

the number of) to say is how many or is developed and calls this a simulator.

Ring to be able to use the PC.

If in the boundary, can learn Web Virtual Programming language for a feeling to make run Web Virtual Programming language and the interest is heated; as for the progress.

By the way, a kind of memory called the register is necessary by all means when I handle data in the memory.

 The data move from a cell in the memory to a cell through this register by all means,

 Such a register is five in Web Virtual Programming language; general register

Memory Map of Figure 1 Web Virtual Programming language.

Memory Map

0 adr	
1 adr	
2 adr	
FFFFFF$_H$ adr	
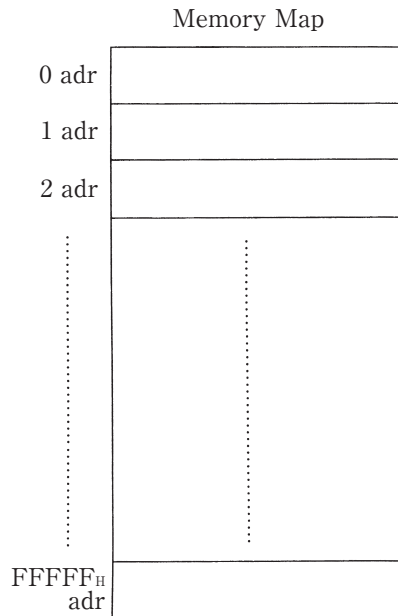
Figure 1   Memory Map

We are called (general register). These general register is 16 bits as well as a cell of the memory.

In other words, 16 bit which, Web Virtual Programming language.

 is the same as a PC, and are the most popular at the present.

It may be said that it is PC. Is FFFFFH, and the number of kinds of the information of 16 bits obeys it; and Web Virtual Programming language.

In the address that the memory consisted of cells, and was attached to the above-mentioned cell.

There will be it to the FFFFFH address.

Go back up ahead of a story; and from a cell of the memory to a register.

To move data; the mnemonic called the LD.

The LD is abbreviation of Load. Figure 3 is an LD life.

It is an example of the Web Virtual Programming language program including ordering.

LD GR 0,A expresses one order of Web Virtual Programming language.

The meaning is general register 0 by data at the A address.

It is copy for (the first register of the register who is five).

 At this chance the contents at the address,

I am careful about not changing (the one such as the copy is right not movement). The LD is a cash register from memory.

The objection is data copying from a register to memory. In other words, ST GR 0,

It mean that B stores away contents of GR 0 at the B address.

The register is a plan of GR 0,GR 1,GR 2GR 3,GR 4,GR 5,GR 6,GR 7 as described above

When is seven, but ,GR 4 is used as stack pointer (mention it later about the stack);

It becomes seven to be usable as a register then.

Structure picking up a certain orders in a cell sequentially is program counter (Program Counter:PC

It is in a kind of register who I abbreviate (and is said to be). A register of 16 bits can appear, and there is this, too.

It is Figure 3

It will return to program. This program is PGM START BEGIN
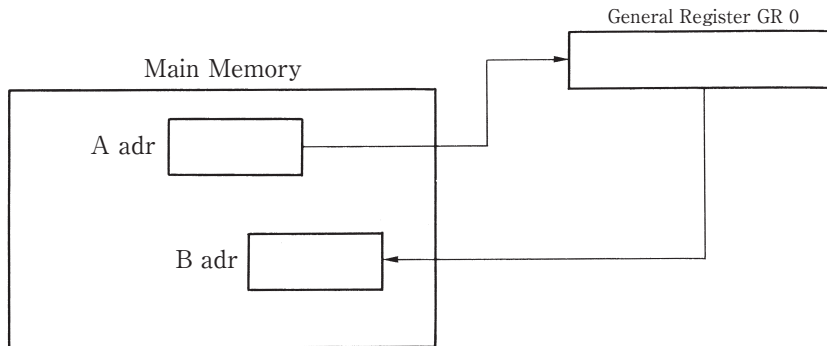
Figure 2 main memory and general register.

Figure 2   Main Memory and General Register

Example program including the Figure 3 LD Figure 4

```
PGM          START       BEGIN
BEGIN        LD          GR0,A
             LEA         GR1,A
             ST          GR0,B
             ST          GR1,C
             EXIT
A            DC          #0015
B            DS          1
C            DS          1
             END
```
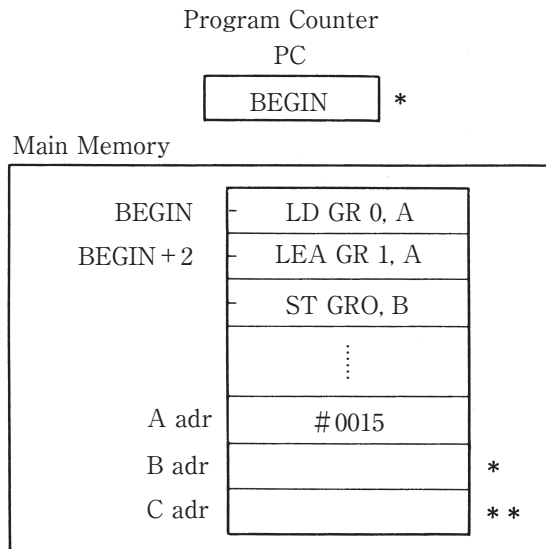
Figure 3   Program include LD command

Program Counter

PC

| BEGIN | *

Main Memory

BEGIN	LD GR 0, A	
BEGIN + 2	LEA GR 1, A	
	ST GRO, B	
	⋮	
A adr	#0015	
B adr		*
C adr		* *

Figure 4   Main Memory

The START is said to be pseudo-instruction not mnemonic. This is a practice start of the programs.

It is an order to order address to a computer. In the above example, practice begins in the BEGIN address.

By the way, the absolute address where it is assigned to if the practice start address of the order is BEGIN to PC.

When one order is executed (2 bytes grows as for 1 order), 2 is added to a PC automatically.

I know the place of the cell in the next order if I look in a PC in this way. Usually of the 2 bytes length.

Because there are many orders, the contents of the PC increase by 2. usually begin with PC = 0000.

Next Figure 5 is different.

It is the debug result by the Web Virtual Programming language.

It simulator to begin with PC = 0000; with 0002,0004.

I understand a changing state. However, for the divergence to a subroutine or the divergence with the condition.

The value of the PC may change discontinuously more vary from PC = 0016 to PC = 0060 in Figure 5.

```
COMET debug utility CMT Version 1.0  Copyright (c) 1989 T.Sugiyama

GR0=0020  GR1=009E  GR2=0000  GR3=0000  GR4=61A9  PC=0002  FR=0
0002  1100 004C   ST   GR0,004C                           004C=468B
GR0=0020  GR1=009E  GR2=0000  GR3=0000  GR4=61A9  PC=0004  FR=0
0004  1140 005F   ST   GR4,005F                           005F=D104
GR0=0020  GR1=009E  GR2=0000  GR3=0000  GR4=61A9  PC=0006  FR=0
0006  1020 0049   LD   GR2,0049                           0049=000A
GR0=0020  GR1=009E  GR2=000A  GR3=0000  GR4=61A9  PC=0008  FR=0
0008  1010 0048   LD   GR1,0048                           0048=FFEF
GR0=0020  GR1=FFEF  GR2=000A  GR3=0000  GR4=61A9  PC=000A  FR=0
000A  4010 004F   CPA  GR1,004F                           004F=0000
GR0=0020  GR1=FFEF  GR2=000A  GR3=0000  GR4=61A9  PC=000C  FR=2
000C  6000 0016   JPZ    0016
GR0=0020  GR1=FFEF  GR2=000A  GR3=0000  GR4=61A9  PC=000E  FR=2
000E  3210 0051   EOR  GR1,0051                           0051=FFFF
GR0=0020  GR1=0010  GR2=000A  GR3=0000  GR4=61A9  PC=0010  FR=0
0010  2010 0052   ADD  GR1,0052                           0052=0001
GR0=0020  GR1=0011  GR2=000A  GR3=0000  GR4=61A9  PC=0012  FR=0
0012  1000 004E   LD   GR0,004E                           004E=002D
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A9  PC=0014  FR=0
0014  1100 004C   ST   GR0,004C                           004C=0020
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A9  PC=0016  FR=0
0016  8000 0060   CALL   0060
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A8  PC=0060  FR=0
0060  4020 007F   CPA  GR2,007F                           007F=0000
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A8  PC=0062  FR=0
0062  6300 0074   JZE    0074
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A8  PC=0064  FR=0
0064  1120 007E   ST   GR2,007E                           007E=5D00
GR0=002D  GR1=0011  GR2=000A  GR3=0000  GR4=61A8  PC=0066  FR=0
0066  1220 0000   LEA  GR2,0000
GR0=002D  GR1=0011  GR2=0000  GR3=0000  GR4=61A8  PC=0068  FR=1
0068  4010 007E   CPA  GR1,007E                           007E=000A
GR0=002D  GR1=0011  GR2=0000  GR3=0000  GR4=61A8  PC=006A  FR=0
006A  6100 0072   JMI    0072
GR0=002D  GR1=0011  GR2=0000  GR3=0000  GR4=61A8  PC=006C  FR=0
```

Figure 5   Dump List

By PC = 0060,0062,0064 and 2 increase after having been contained in a subroutine.

The above is the structure of the outline of Web Virtual Programming language.

 There is not the thing equal to the input-output device (a virtual calculator).

There is IN (input), OUT (the output) in), macroinstruction (later description); is a keyboard and D each Web Programming.

Reference :Shibui Fumio "Fundation for Infermation prossecing" kyouritu limited