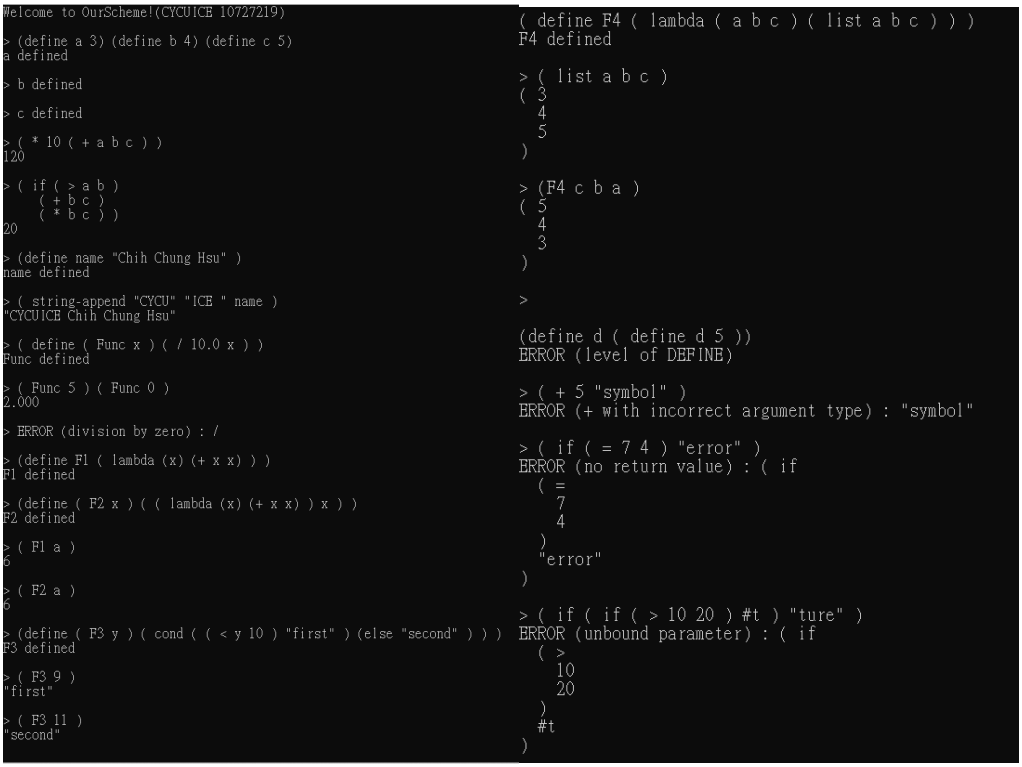
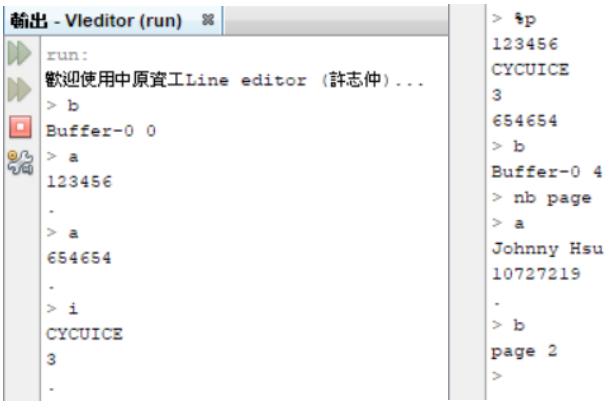
歷年作品

OurScheme(Scheme-Interpreter)



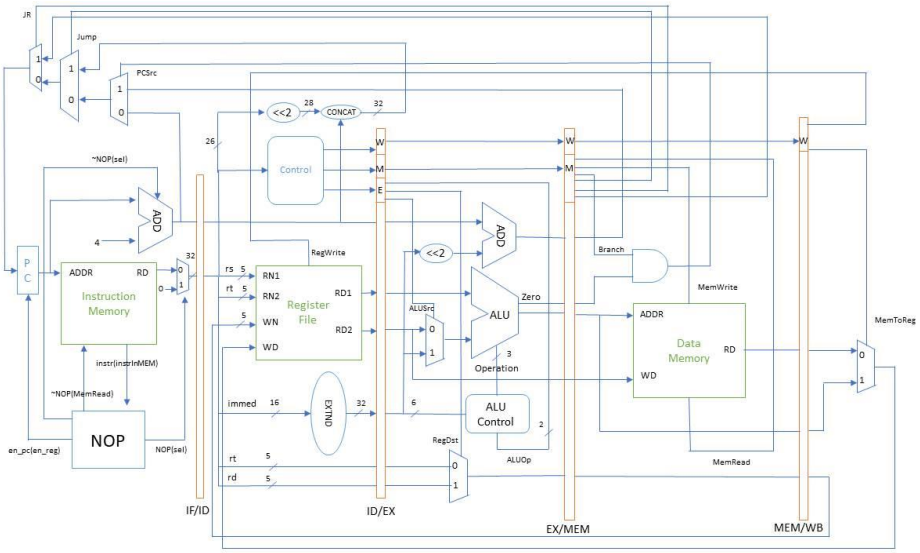
以 C/C++語言實作之 scheme 語言直譯器，除了能夠運行基本的 scheme 語言指令之外，也能處理複雜 function 呼叫、lambda 的宣告，並能針對錯誤語法之指令加以處理並輸出錯誤訊息。

VI-Editor

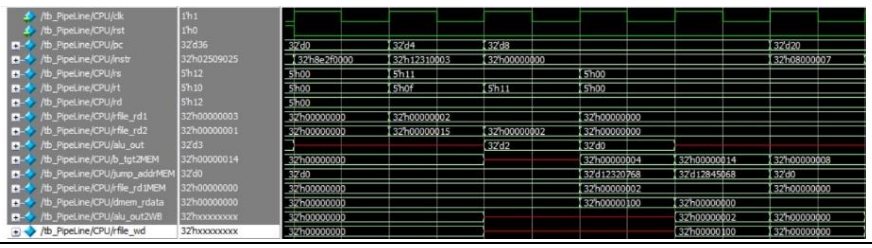


以 java 語言實作的 VI 純文字編輯器，能夠簡易執行新增(a)、插入(i)、新頁(b)、印出(p)等簡易指令。

5 STAGE PIPELINE CPU

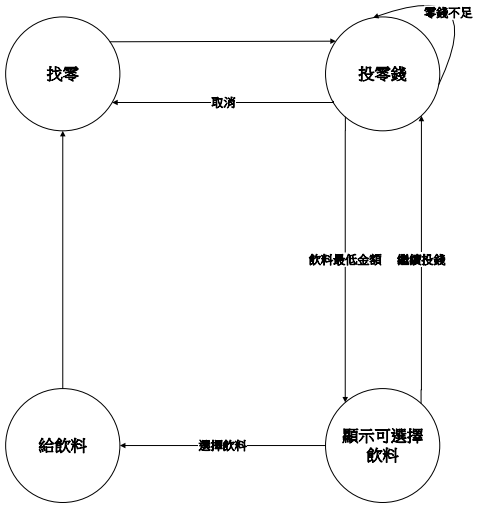



```
#                1, reading data: Mem[         0] => 2385444864
#                1, PC:          0
#                1, wd:          0
#                1, NOP
#
#                2, reg_file[15] =>         21 (Port 2)
#                2, reg_file[17] =>          2 (Port 1)
#                2, reading data: Mem[         4] =>  305201155
#                2, PC:          4
#                2, LW
#
#                3, reg_file[17] =>          2 (Port 2)
#                3, PC:          8
#                3, BEQ
#
#                4, reg_file[ 0] =>          0 (Port 2)
#                4, reg_file[ 0] =>          0 (Port 1)
#                4, reading data: Mem[         2] =>        256
#                4, PC:          8
#                4, wd:          x
#                4, NOP
#
#                6, reg_file[15] <=        256 (Write)
#                5, PC:          8
#                5, wd:        256
#                5, NOP
#
#                6, reading data: Mem[        20] =>  134217735
#                6, PC:         20
#                6, wd:          0
#                6, NOP
#
#                7, PC:         20
#                7, J
#
#                8, PC:         20
#                8, wd:          x
#                8, NOP
#
#                9, PC:         20
#                9, wd:          x
#                9, NOP
#
```



以 Verilog 語言實作模擬的 5 stage pipeline CPU，包含 32bit ALU、除法器、barrel shifter 等元件，可以執行 MIPS 指令。

自動販賣機



Result

CPU Time: sec(s), Memory: kilobyte(s)

```
exchange   0 dollars
coin   5,   total   5 dollars

coin  10,   total  15 dollars
tea(10) | coke(15)

exchange  15 dollars
coin  10,   total  10 dollars
tea(10)

coin  10,   total  20 dollars
tea(10) | coke(15) | coffee(20)

coke out
exchange   5 dollars
coin  10,   total  10 dollars
tea(10)

coin  10,   total  20 dollars
tea(10) | coke(15) | coffee(20)

not enough money
coin  10,   total  30 dollars
tea(10) | coke(15) | coffee(20) | milk(25)

tea out
exchange  20 dollars
coin  50,   total  50 dollars
tea(10) | coke(15) | coffee(20) | milk(25)

milk out
exchange  25 dollars
** VVP Stop(0) **
** Flushing output streams.
** Current simulation time is 230 ticks.
>
```

以 Verilog 語言實作，使用有限狀態機實踐的自動販賣機，共有投零錢、顯示、給飲料、找零等四階段功能。

SIC/XE Assembler

SICXE_input.txt - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明

```
COPY    START 0
        var1    RESW    1
        var2    RESB    12
        var3  EQU  12
add var1
+addf var2
addr a,b
+and var1
clear b
comp 0
+compf var3
compr b,a
.this is comment
div var1
divf var1
divr l,s
fix
float
END     FIRST
```

C:\Users\JohnnyHsu\Documents\GitHub\CYCUICE_SP\Cross Assembler\10727219.exe

```
SP Project2
Please choose
1. SIC, 2. SIC/XE, 0 quit
Input :2
1
Please enter FileName：SICXE_input.txt
f1

Line  Location  Source code                          Object code
----  --------  ------------------------             -----------
   5      0000    COPY    START       0
  10      0000    var1     RESW       1
  15      0003    var2     RESB      12
  20      000C    var3      EQU      12
  25      000F               add    var1                  1B2FEE
  30      0012         +    addf    var2                5B100003
  35      0016              addr       a,      b             9003
  40      0018         +     and    var1                43100000
  45      001C             clear       b                    B430
  50      001E              comp       0                  2B0000
  55      0021         +   compf    var3                8B10000C
  60      0025             compr       b,      a             A030
  65          .this is comment
  70      0027               div    var1                  272FD6
  75      002A              divf    var1                  672FD3
  80      002D              divr       l,      s             9C24
  85      002F               fix                             C4
  90      0030             float                             C0
  95              END   FIRST
Please choose
```

以 C/C++語言實作之 SIC/XE Assembler，以 2 Pass 的作法將 input 指令進行切 token、翻譯成 object code 的步驟。

Paging management

input1.txt - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明

```
3
123412512345
```

out_input1.txt - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明

```
-------------FIFO----------------------
1       1       F
2       21      F
3       321     F
4       432     F
1       143     F
2       214     F
5       521     F
1       521
2       521
3       352     F
4       435     F
5       435
Page Fault = 9  Page Replaces = 6  Page Frames = 3

-------------LRU-----------------------
1       1       F
2       21      F
3       321     F
4       432     F
1       143     F
2       214     F
5       521     F
1       152
2       215
3       321     F
4       432     F
5       543     F
Page Fault = 10  Page Replaces = 7  Page Frames = 3
```

以 C/C++語言實作 memory 中的六種分頁法包含 FIFO、LRU、LFU+FIFO、MFU+FIFO、LFU+LRU、MFU+LRU 等方法。

Show Hand

```
S4 S6 S8 S7 S5
-1
HQ DQ C2 S2 CQ
-1
Straight flush (Eight of Spades) wins over full house (Queen of Hearts).
--------------------------------
Process exited after 115 seconds with return value 0
請按任意鍵繼續 . . .
```

以 C/C++語言實作的簡易撲克牌遊戲，根據兩位玩家輸入的牌組進行比對，根據擁有的組合和點數大小分出勝負。

CPU Scheduling

input1.txt - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明

```
6        1
ID      CPU Burst   Arrival Time    Priority
5        6          26          13
13       1          7           2
6        5          1           7
27       6          3           7
2        3          30          13
1        2          13          5
9        4          1           6
10       8          2           13
0        4          36          1
8        2          23          12
7        1          3           16
29       6          20          8
4        3          18          10
20       3          15          14
3        4          22          3
```

out_input1.txt - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明

```
-997996D6666R11KKK444RR88RRR3333222T0000TTTTT555555AAAAAAAA
==          PPRR==
-99996RD6R6R611R6RR4TT3333TTTT4488A500002A52A52A5A5A5AAKKK7
==          HRRN==
-6666679999DRRRRRR11AAAAAAAAKKK444883333TTTTTT2225555550000
============================================================

waiting
ID      FCFS    RR      SRTF    PPRR    HRRN
============================================================
0       19      18      0       0       19
1       13      8       0       0       5
2       22      19      2       14      16
3       18      25      6       0       14
4       13      19      0       11      13
5       20      27      19      21      23
6       0       15      6       11      0
7       15      2       0       55      3
8       21      14      0       9       11
9       5       13      1       0       6
10      8       37      49      45      18
13      18      3       0       0       4
20      13      17      0       40      13
27      16      28      19      10      9
29      14      31      19      4       20
============================================================
```

以 C/C++語言實作模擬 CPU 排成演算法，包括 FCFS、Round Robin、SRTF、PPRR、HRRN 等五種 method。