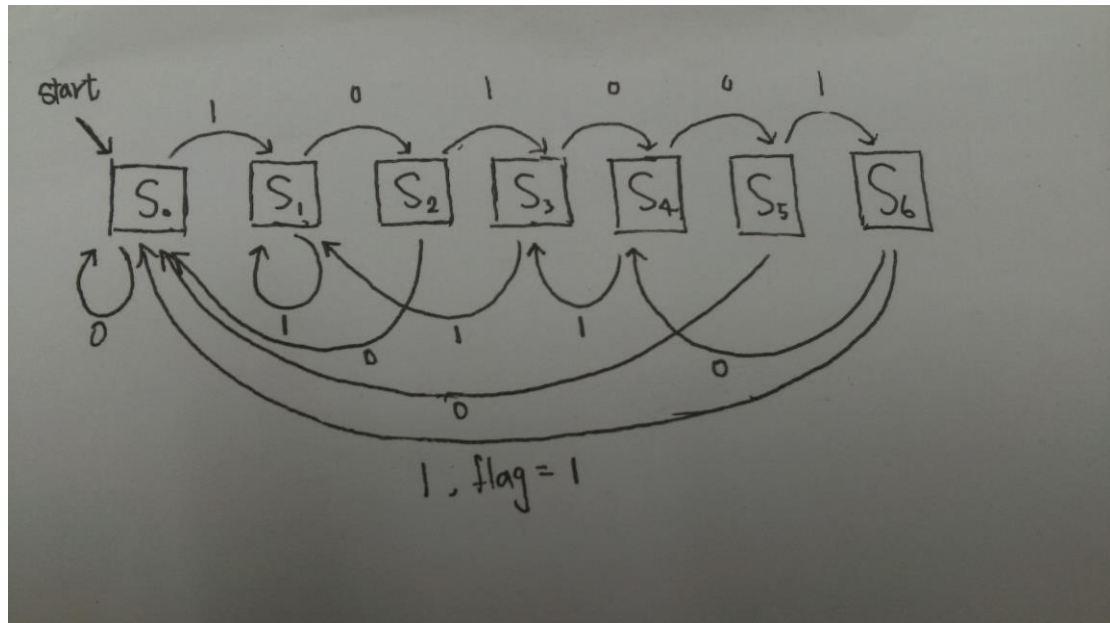


State Transition Graph:



由 S_0 開始，若符合 10 100 11 可不經過重複的 state 回到 S_0 並豎起 flag。

S_1 、 S_3 失敗時回到 S_1 因為 1 即是數列的開頭。

S_0 、 S_2 、 S_5 失敗即得重頭。

S_4 較特殊，10101 可視為 101，即回到 S_3 。

S_6 時 data 為 1 即為偵測到，故豎起 flag，而為 0 時，有機會在循環一個(100)回到 S_6 。

Ncverilog 模擬結果 (sim + syn):

Sim:

```

[dld0110@ic53 ~/lab3_student]$ ncverilog PTM.v PTM_tb.v +access+r
ncverilog: 14.10-s005: (c) Copyright 1995-2014 Cadence Design Systems, Inc.
Caching library 'worklib' ..... Done
Elaborating the design hierarchy:
Building instance overlay tables: ..... Done
Generating native compiled code:
worklib.PTM.v <0x538ebbb0>
streams: 5, words: 3257
worklib.PTM_tb.v <0x161e94ff>
streams: 7, words: 8943
Building instance specific data structures.
Loading native compiled code: ..... Done
Design hierarchy summary:
          Instances  Unique
Modules:         2       2
Registers:       15      15
Scalar wires:    6       -
Vectored wires:  3       -
Always blocks:   3       3
Initial blocks:  4       4
Cont. assignments: 3       4
Pseudo assignments: 2      2
Writing initial simulation snapshot: worklib.PTM_tb.v
Loading snapshot worklib.PTM_tb.v ..... Done
*Verdi3* Loading libsscore_ius141.so
*Verdi3* : Enable Parallel Dumping.
ncsim> source /usr/cad/cadence/INCISIV/cur/tools/inca/files/ncsimrc
ncsim> run
  
```

```

FSDB Dumper for IUS, Release Verdi3_J-2014.12-SP3, Linux, 07/05/2015
(C) 1996 - 2015 by Synopsys, Inc.
*Verdi3* FSDB WARNING: The FSDB file already exists. Overwriting the FSDB file may crash the programs that are using this file
*Verdi3* : Create FSDB file 'PTM.fsdb'
*Verdi3* : Begin traversing the scopes, layer (0).
*Verdi3* : End of traversing.

*Verdi3* WARNING: fsdbDumpfile - One FSDB file has already opened for dumping.
*Verdi3* : Begin traversing the scopes, layer (0).
*Verdi3* : End of traversing.
GET ! addr = 18 , your_flag = 1 , ans_flag = 1
GET ! addr = 32 , your_flag = 1 , ans_flag = 1
GET ! addr = 45 , your_flag = 1 , ans_flag = 1
GET ! addr = 58 , your_flag = 1 , ans_flag = 1
GET ! addr = 70 , your_flag = 1 , ans_flag = 1
GET ! addr = 86 , your_flag = 1 , ans_flag = 1
GET ! addr = 120 , your_flag = 1 , ans_flag = 1
GET ! addr = 159 , your_flag = 1 , ans_flag = 1
GET ! addr = 199 , your_flag = 1 , ans_flag = 1

Result = 9 , Answer = 9
!!!! ACCEPTED !!!!!

Simulation complete via $finish(1) at time 30780 NS + 0
./PTM_tb.v:97 $finish;
ncsim> exit

```

Syn:(many warning..)

```

[jld0110@ic53 ~/Lab3 student#]$ ncverilog PTM.v PTM_tb.v
ncverilog: 14.10-s005: (c) Copyright 1995-2014 Cadence Design Systems, Inc.
Loading snapshot worklib.PTM_tb.v ..... Done
*Verdi3* Loading libsscore_ius141.so
*Verdi3* : Enable Parallel Dumping.
ncsim> source /usr/cad/cadence/INCISIV/cur/tools/inca/files/ncsimrc
ncsim> run
FSDB Dumper for IUS, Release Verdi3_J-2014.12-SP3, Linux, 07/05/2015
(C) 1996 - 2015 by Synopsys, Inc.

```

```

GET ! addr = 18 , your_flag = 1 , ans_flag = 1
GET ! addr = 32 , your_flag = 1 , ans_flag = 1
GET ! addr = 45 , your_flag = 1 , ans_flag = 1
GET ! addr = 58 , your_flag = 1 , ans_flag = 1
GET ! addr = 70 , your_flag = 1 , ans_flag = 1
GET ! addr = 86 , your_flag = 1 , ans_flag = 1
GET ! addr = 120 , your_flag = 1 , ans_flag = 1
GET ! addr = 159 , your_flag = 1 , ans_flag = 1
GET ! addr = 199 , your_flag = 1 , ans_flag = 1

Result = 9 , Answer = 9
!!!! ACCEPTED !!!!!

Simulation complete via $finish(1) at time 30780 NS + 0
./PTM_tb.v:97 $finish;
ncsim> exit

```

```

*Verdi3* WARNING: fsdbDumpfile - One FSDB file has already opened for dumping.
*Verdi3* : Begin traversing the scopes, layer (0).
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.wrong_flag(25)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.maxSize(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.clk(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.rst(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.start(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.tf(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.data(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.fin(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.en(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.flag(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.result(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.addr(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_flag(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_state(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_state(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_sum(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_sum(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_num(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_num(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_clk(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_rst(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_start(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_data(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_en(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_fin(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_addr(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_result(36)
*Verdi3* : End of traversing.

```

```

*Verdi3* FSDB WARNING: The FSDB file already exists. Overwriting the FSDB file may crash the programs that are using this file.
*Verdi3* : Create FSDB file 'PTM.fsdb'
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*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.wrong_flag(25)
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*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.data(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.fin(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.en(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.flag(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.result(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.addr(36)
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*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_state(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_sum(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_sum(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_num(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_next_num(48)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_clk(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_rst(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_start(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_data(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_en(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_fin(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_addr(36)
*Verdi3* WARNING: [NoReadAccess][FilterOut]Name:PTM_tb.ptm_result(36)
*Verdi3* : End of traversing.

*Verdi3* WARNING: fsdbDumpfile - One FSDB file has already opened for dumping.
*Verdi3* : Begin traversing the scopes, layer (0).

```

Block Diagram:

