

B10815013

范恩琪

四資工二甲

Digital Logic Design Project 4 – State Minimization

In this project, we are required to write a program for state minimization. I will list down all my .kiss file (input and output).

4 states, 1 input, 1 output:

input4.kiss :

```
.start_kiss
.i 1
.o 1
.p 9
.s 4
.r a
0 a d 0
1 a a 0
0 b d 0
1 b a 0
0 c d 0
1 c b 1
0 d a 1
1 d d 0
0 c a 1
.end_kiss
```

output4.kiss :

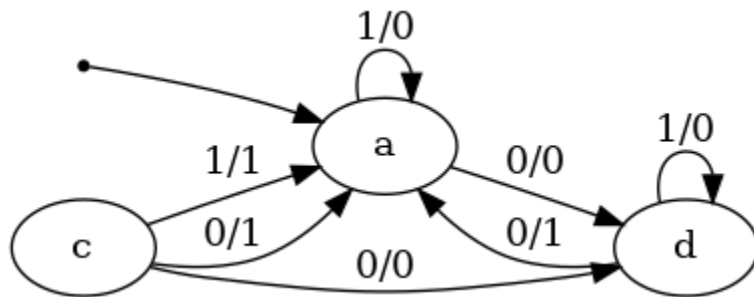
```
.start_kiss
.i 1
.o 1
.p 7
.s 3
.r a
0 a d 0
1 a a 0
0 c d 0
1 c a 1
0 c a 1
0 d a 1
1 d d 0
.end_kiss
```

output4.dot :

```
graph LR
    INIT(( )) --> a((a))
    a -- "1/0" --> a
    a -- "0/0" --> d((d))
    a -- "1/1" --> a
    c((c)) -- "1/1" --> a
    c -- "0/1" --> a
    c -- "0/0" --> d
    d -- "0/1" --> a
    d -- "1/0" --> d
```

graph LR; INIT(()) --> a((a)); a -- "1/0" --> a; a -- "0/0" --> d((d)); a -- "1/1" --> a; c((c)) -- "1/1" --> a; c -- "0/1" --> a; c -- "0/0" --> d; d -- "0/1" --> a; d -- "1/0" --> d;

output4.png :



5 states, 1 input, 1 output:

input5.kiss :

```
.start_kiss
.i 1
.o 1
.p 10
.s 5
.r a
0 a d 0
1 a a 0
0 b e 0
1 b a 0
0 c e 0
1 c b 1
0 d a 1
1 d d 0
0 e a 1
1 e d 0
.end_kiss
```

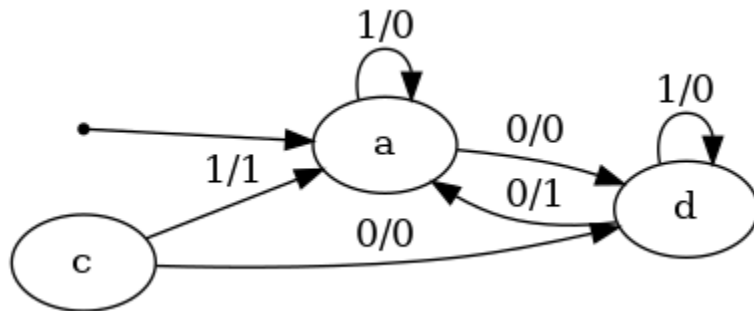
output5.kiss :

```
.start_kiss
.i 1
.o 1
.p 6
.s 3
.r a
0 a d 0
1 a a 0
0 c d 0
1 c a 1
0 d a 1
1 d d 0
.end_kiss
```

output5.dot :

```
graph LR
    subgraph STG
        direction LR
        INIT((INIT)) --> a((a))
        a -- "0/0" --> d((d))
        a -- "1/0" --> a
        c((c)) -- "0/0" --> d
        c -- "1/1" --> a
        d -- "0/1" --> a
        d -- "1/0" --> d
    end
```

output5.png :



6 states, 1 input, 1 output:

input3.kiss :

```
.start_kiss
.i 1
.o 1
.p 12
.s 6
.r a
0 a b 1
1 a c 0
0 b f 0
1 b d 0
0 c d 1
1 c e 1
0 d f 0
1 d e 1
0 e a 0
1 e d 0
0 f b 1
1 f c 0
.end_kiss
```

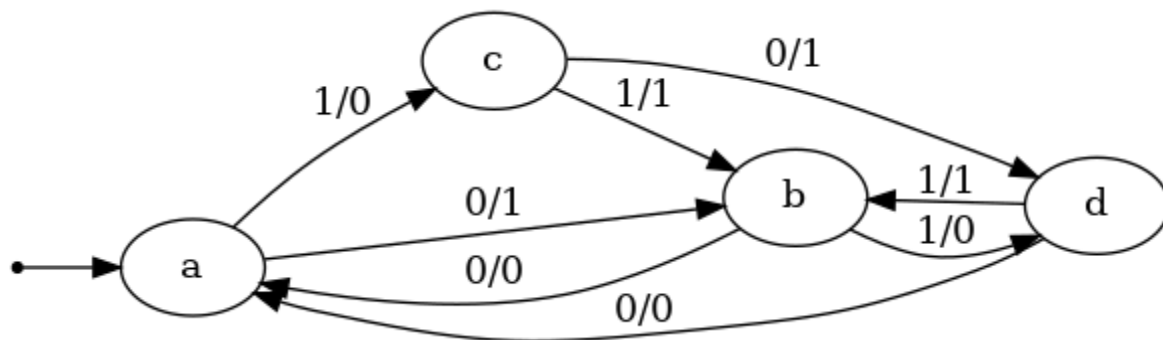
output3.kiss :

```
.start_kiss
.i 1
.o 1
.p 8
.s 4
.r a
0 a b 1
1 a c 0
0 b a 0
1 b d 0
0 c d 1
1 c b 1
0 d a 0
1 d b 1
.end_kiss
```

output3.dot :

```
graph LR
    INIT((INIT)) --> a((a));
    a -- "0/1" --> b((b));
    a -- "1/0" --> c((c));
    b -- "0/0" --> a;
    b -- "1/0" --> d((d));
    c -- "0/1" --> d;
    c -- "1/1" --> b;
    d -- "0/0" --> a;
    d -- "1/1" --> b;
```

output3.png :



6 states, 2 inputs, 1 output:

(This state is the minimal state)

input1.kiss :

```
.start_kiss
.i 2
.o 1
.p 24
.s 6
.r a
00 a a 0
01 a c 0
11 a e 0
10 a d 0
00 b d 0
01 b e 0
11 b e 0
10 b a 0
00 c e 1
01 c a 1
11 c f 1
10 c b 1
00 d b 0
01 d c 0
11 d c 0
10 d b 0
00 e c 1
01 e d 1
11 e f 1
10 e a 1
00 f f 1
01 f b 1
11 f a 1
10 f d 1
.end_kiss
```

output1.kiss :

```
.start_kiss
.i 2
.o 1
.p 24
.s 6
.r a
00 a a 0
01 a c 0
11 a e 0
10 a d 0
00 b d 0
01 b e 0
11 b e 0
10 b a 0
00 c e 1
01 c a 1
11 c f 1
10 c b 1
00 d b 0
01 d c 0
11 d c 0
10 d b 0
00 e c 1
01 e d 1
11 e f 1
10 e a 1
00 f f 1
01 f b 1
11 f a 1
10 f d 1
.end_kiss
```

output1.dot :

```
graph LR
    a((a)) -- "00/0" --> a
    a -- "01/0" --> c((c))
    a -- "11/0" --> e((e))
    a -- "10/0" --> d((d))
    b((b)) -- "00/0" --> d
    b -- "01/0" --> e
    b -- "11/0" --> e
    b -- "10/0" --> a
    c -- "00/1" --> e
    c -- "01/1" --> a
    c -- "11/1" --> f((f))
    c -- "10/1" --> b
    d -- "00/0" --> b
    d -- "01/0" --> c
    d -- "11/0" --> c
    d -- "10/0" --> b
    e -- "00/1" --> c
    e -- "01/1" --> d
    e -- "11/1" --> f
    e -- "10/1" --> a
    f -- "00/1" --> f
    f -- "01/1" --> b
    f -- "11/1" --> a
    f -- "10/1" --> d
```


output1.png :

