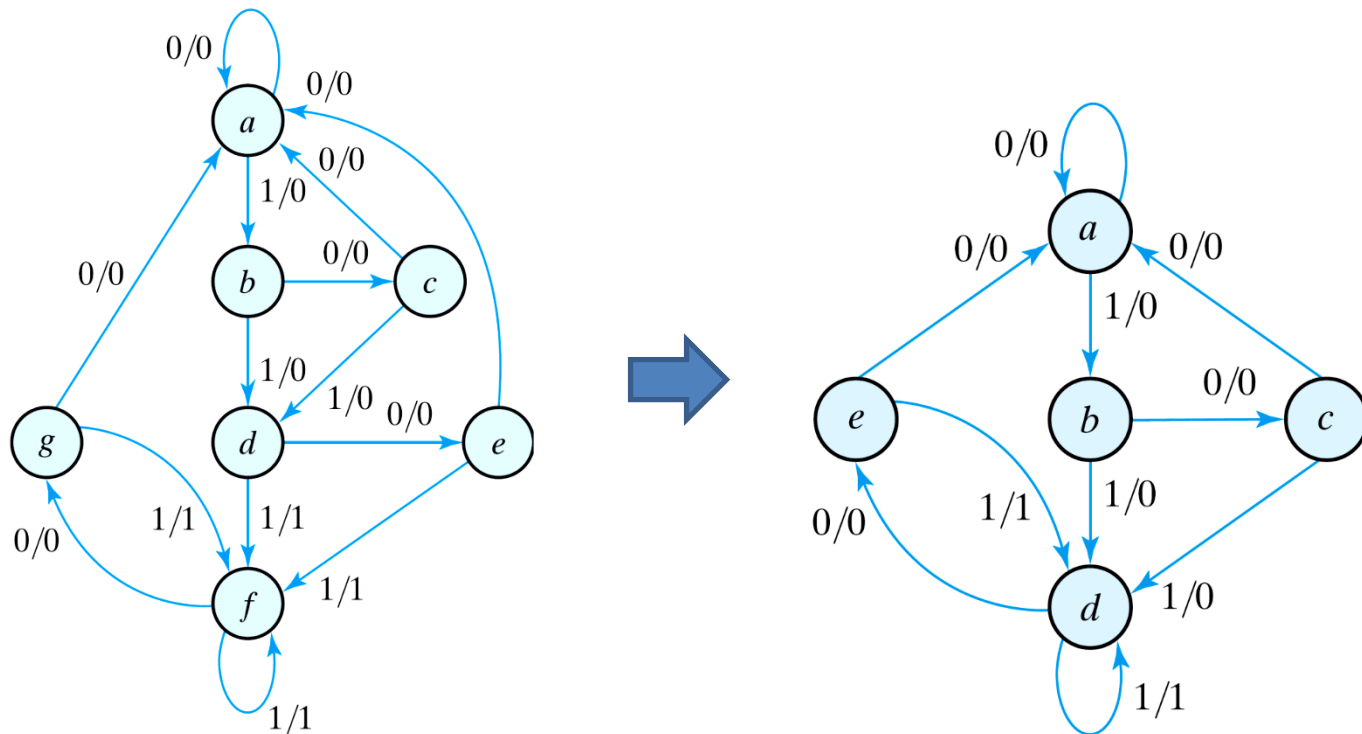


Programming Assignment 3

State Reduction for Sequential Circuits

State reduction

- **State reduction** is a technique to reduce the state count in a state diagram



Objective

- Develop a state reduction approach to optimize a state diagram/sequential circuit
- Input
 - A state diagram S in the **KISS** format
- Output
 - An optimized state diagram S' in the KISS format
- Requirement
 - $S \equiv S'$

KISS format

.i <num-inputs>

.o <num-outputs>

.s <num-states>

.p <num-terms>

.r <reset-state>

<input> <current-state> <next-state> <output>

...

<input> <current-state> <next-state> <output>

.e

```
.i 2
.o 1
.s 6
.p 11
.r s0
00 s0 s1 0
01 s0 s2 1
10 s0 s3 1
11 s1 s2 0
01 s1 s5 0
10 s2 s4 0
00 s2 s3 0
01 s3 s4 1
11 s3 s5 1
01 s4 s5 0
11 s5 s0 0
.e
```

Comments

- In the beginning of the file, a “#” begins a comment that extends to the **end** of the current line
- Comments give a brief description of the circuit

```
# This is a comment  
# Testcase #1
```

```
...
```

Example

This is a comment

.i 2

.o 1

.s 6

.p 11

.r s0

00 s0 s1 0

01 s0 s2 1

10 s0 s3 1

11 s1 s2 0

01 s1 s5 0

10 s2 s4 0

00 s2 s3 0

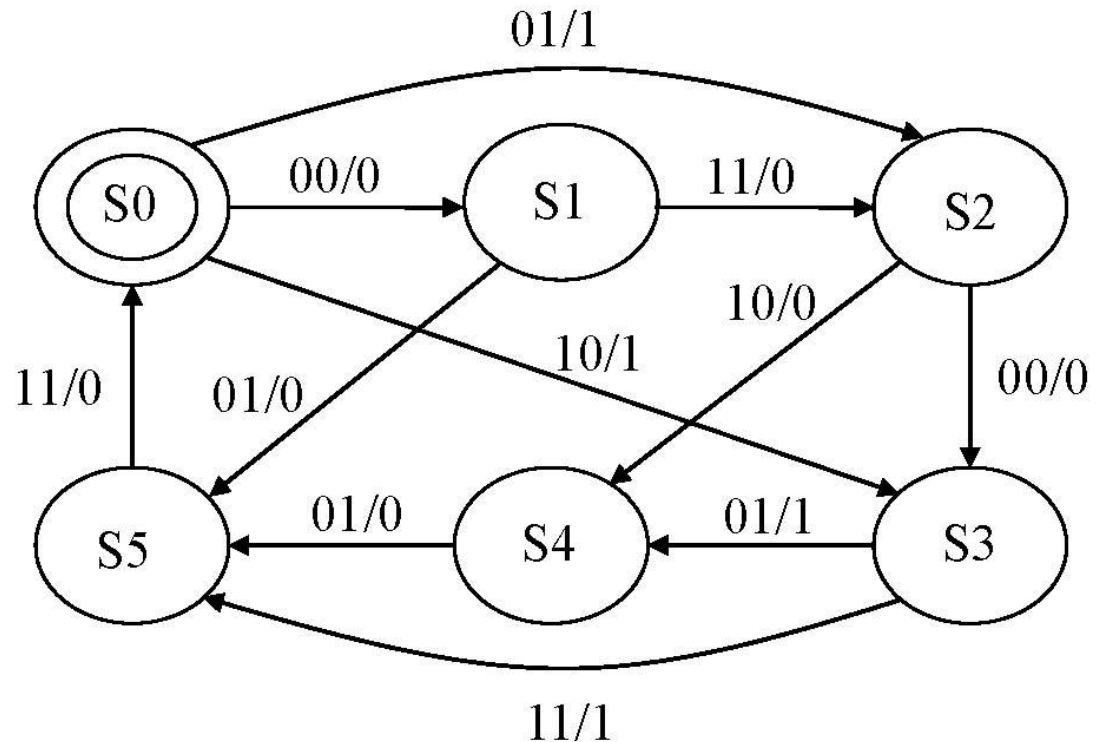
01 s3 s4 1

11 s3 s5 1

01 s4 s5 0

11 s5 s0 0

.e



Notice

- For a state diagram, some state transitions may not be specified
 - i.e., don't cares
- **Two states can be merged, if their specified transitions have no conflict**
 - e.g., S5 and S0, S5 and S2, S5 and S4

Requirements

- Your program should work correctly
- Your program should be executable compiled by Dev C++ or other legally licensed compliers

Grading

- You will get a full score, if you program reports the best result among all the students
 - Summation of the state counts of all benchmarks
- **YOU WILL GET A VERY LOW SCORE, IF YOUR SOURCE CODE IS SIMILAR TO OTHERS**

Delivery

- Due date
 - 12/24(Thu.) (two weeks)
 - Fixed due date, no late delivery is allowed
- Deliveries
 - Your source code(s)
 - A readme to describe how to run your program
 - Pictures show your execution results for the given testbenches by PrintScr