

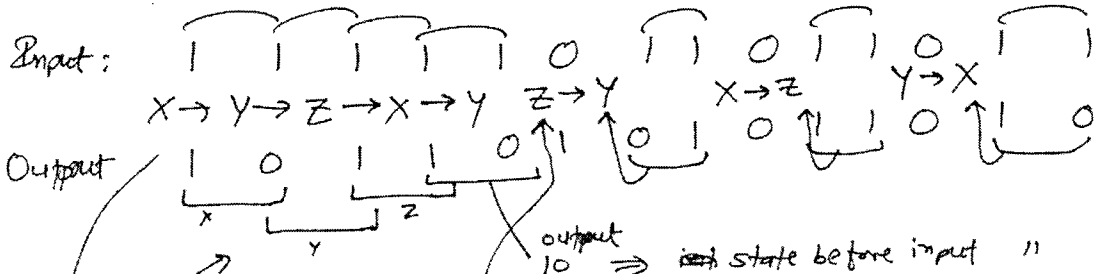
Constructing a state table from checking sequences

Input: 1111, 1011, 0110, 11

Output: 1011, 0101, 0110, 10

Given: no more than 3 states

11 distinguishing sequence.



three unique responses to input 11
 \Rightarrow 3 different states
 \Rightarrow 11 is a distinguishing sequence

output 10 \Rightarrow state before input must be X
 $\Rightarrow Z \xrightarrow{1} X$

We know that
 $X \xrightarrow{1} Z$
 and $Y \xrightarrow{1} X$
 and $X \xrightarrow{0} Y$
 $Z \xrightarrow{0} X$
 $Y \xrightarrow{0} Z$

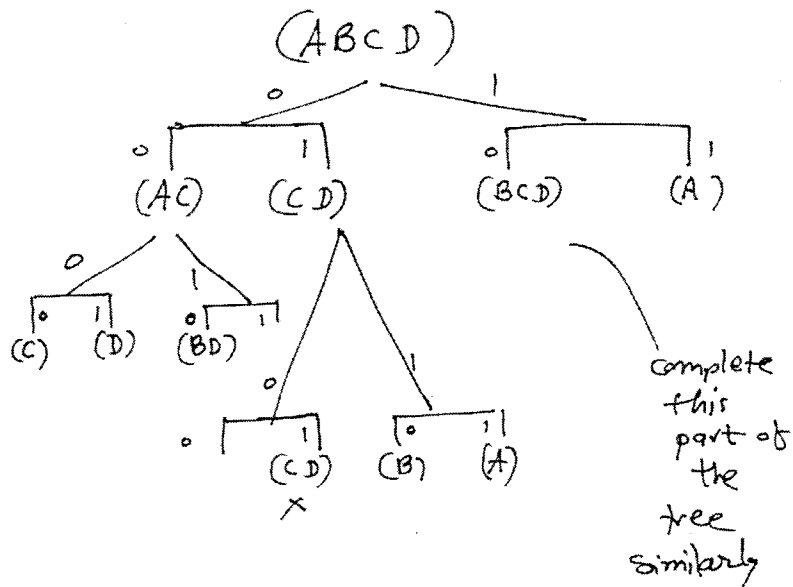
Goal: given the maximum number of states, and output sequence corresponding to an input sequence, determine transition table.

| | 0 | 1 |
|---|------|------|
| X | Z, 0 | Y, 1 |
| Y | X, 0 | Z, 0 |
| Z | Y, 1 | X, 1 |

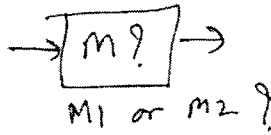
Adaptive Homing Experiment:

Inputs may depend on observed outputs.
 Goal is to uniquely identify final state.

| | 0 | 1 |
|---|------|------|
| A | C, 0 | D, 0 |
| B | A, 0 | C, 0 |
| C | D, 1 | B, 0 |
| D | C, 1 | A, 1 |



Machine Identification : Distinguishing two machines

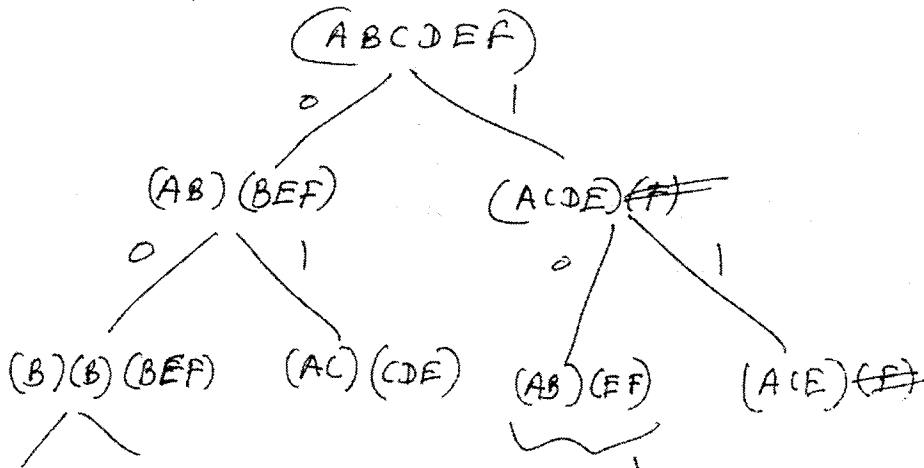


| | 0 | 1 |
|---|----------------|-----|
| A | B 0 | A 0 |
| B | B 0 | C 0 |
| C | A 1 | C 0 |

M1

| | 0 | 1 |
|---|-----|-----|
| D | E 0 | F 1 |
| E | F 0 | E 0 |
| F | E 0 | D 0 |

M2



Since
 state of
 M1 and M2
 are distinguishable
 from each other

