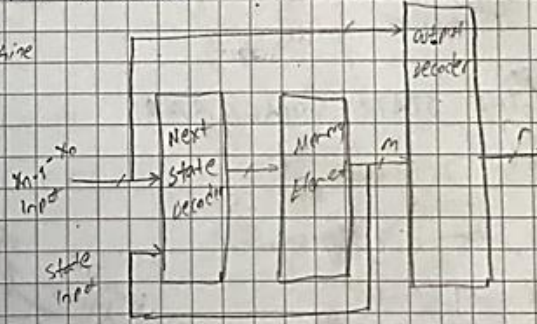


Models for Sequential Machines

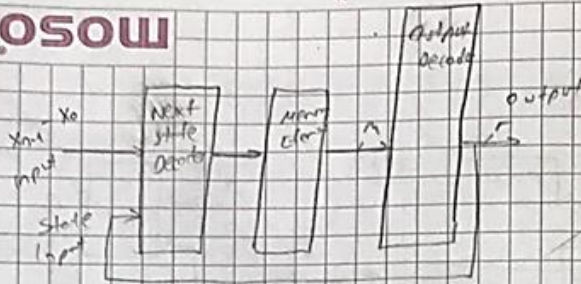
- 1) A type Machine = Mealy Machine
- 2) B
- 3) C
- 4) D → look-up Memory
- 5) E



A Machine: Mealy Machine

↓
Çıkış değerleri, hem mevcut durum hem de giriş değerleri tarafından belirlenir.

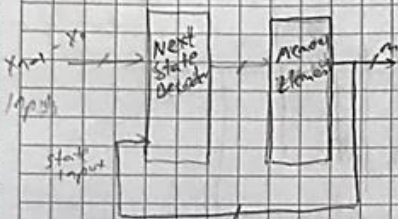
MOSE



B Machine: Moore Machine

Input bir sonraki durumu etkiler

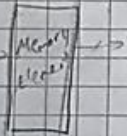
Mevcut çıkış değerleri yalnızca mevcut durum tarafından belirlenen bir sonraki durumla değişir.



C Machine: Moore Machine



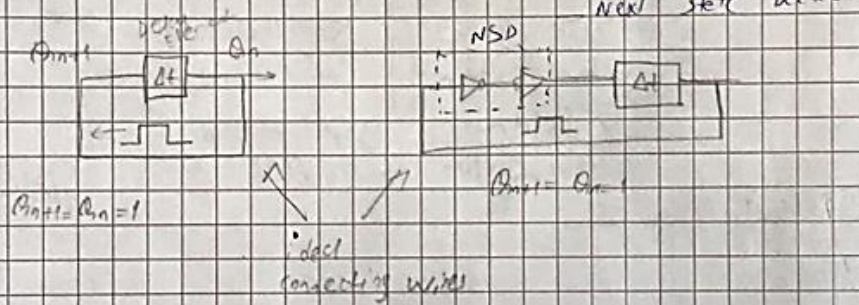
D Machine



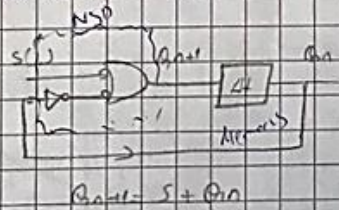
E Machine

Basic Memory Cell

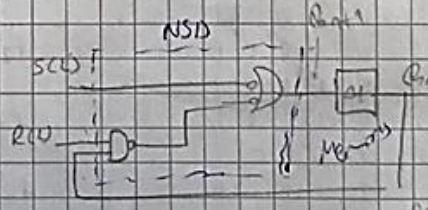
Heuristic Development of the Basic Cell



A) NAND-CENTERED BASIC CELL



| S | Q_{n+1} |
|---|------------|
| 0 | Q_n Hold |
| 1 | 1 SET |



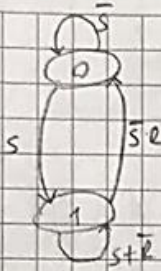
| S | R | Q_{n+1} |
|---|---|------------|
| 0 | 0 | Q_n Hold |
| 0 | 1 | 0 Reset |
| 1 | 0 | 1 Set |
| 1 | 1 | 1 Set * |

| $Q_n \rightarrow Q_{n+1}$ | S | R |
|---------------------------|---|---|
| 0 0 | 0 | 0 |
| 0 1 | 0 | 1 |
| 1 0 | 1 | 0 |
| 1 1 | 1 | 1 |

Operation Table
Truth Table

State Transition Table
Excitation

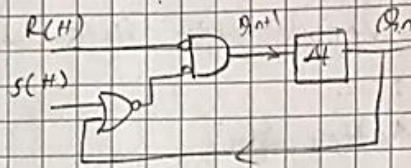
OSOW



NAND-CENTERED
BASIC CELL is
SET DOMINANT

bu diagram
set/reset
geliş
çerçevesi

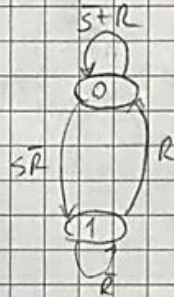
3) NOR-CENTERED BASIC CELL



$$Q_{n+1} = R(S + Q_n)$$

| S | R | Q_{n+1} |
|---|---|------------|
| 0 | 0 | Q_n Hold |
| 0 | 1 | 0 Reset |
| 1 | 0 | 1 Set |
| 1 | 1 | 0 Reset x |

| $Q_n \rightarrow Q_{n+1}$ | S | R |
|---------------------------|-----|---|
| 0 0 | 0 0 | |
| 0 1 | 0 1 | |
| 1 0 | 1 0 | |
| 1 1 | 0 1 | |
| | 0 0 | |

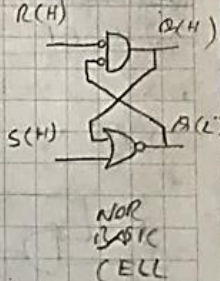
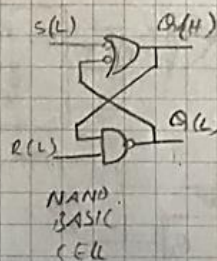


THE NOR-CENTERED
BASIC CELL is
RESET DOMINANT

Basic Cell : Generic form

| S | R | Q_{n+1} |
|---|---|-----------|
| 0 | 0 | Q_n |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 x |

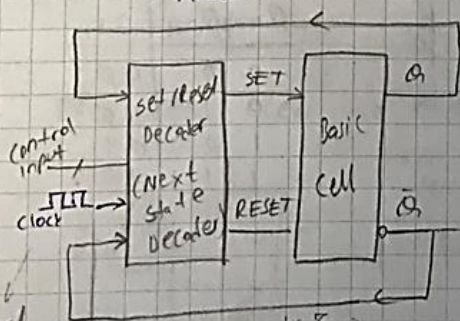
| $Q_n \rightarrow Q_{n+1}$ | S | R |
|---------------------------|---|---|
| 0 0 | 0 | 0 |
| 0 1 | 1 | 0 |
| 1 0 | 0 | 1 |
| 1 1 | 0 | 0 |



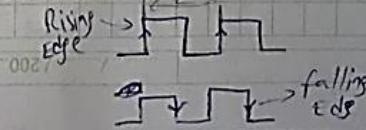
Constraint : $SR = 0$

Çıktıları

FLIP-flops



her bir
flip-flop'da
set/reset
bölümü
var

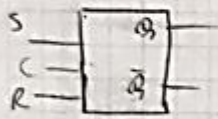


Types of Flip-flops (FF)

- 1) SR FF
 - 2) XYVW FF - bu flip-flop bir flip-flop değildir.
 - 3) JK
 - 4) D
 - 5) T
 - 6) Master-slope FF
- JK, D, ve T flip-flop'ların elde etme
kodu gelmiştir.
teorik bir flip-flop
fl

OSOW

SR FF



| S | R | Q_n | Q_{n+1} |
|---|---|-------|-----------|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | ϕ |
| 1 | 1 | 1 | ϕ |

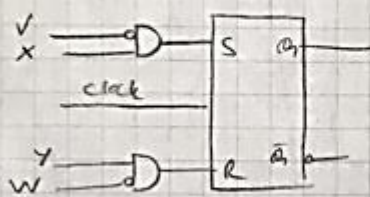
| S | R | Q_{n+1} |
|---|---|-----------|
| 0 | 0 | Q_n |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | ϕ |

| $Q_n - Q_{n+1}$ | S | R |
|-----------------|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

$$Q_{n+1} = S + \bar{R}Q_n$$

$$SR = 0$$

XYVW FF



$$S = XV$$

$$R = YW$$

$$Q_{n+1} = S + \bar{R}Q_n$$

$$= XV + \bar{Y}\bar{W}Q_n$$

(constraints)

$$SR = 0$$

$$XY\bar{V}\bar{W} = 0$$