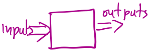
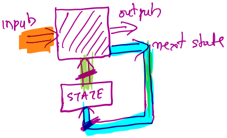
Logic Design 7/12/21

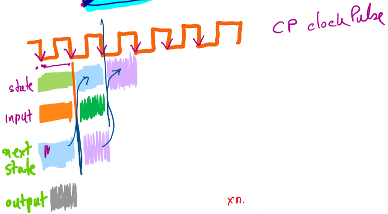
Τρίτη, 7 Δεκεμβρίου 2021 16:58

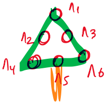
Καλησπέρα!


inputs
outputs

∄ feedback loop


inputs
outputs
next state
STATE


CP clock Pulse
state
input
next state
output


Λ1
Λ2
Λ3
Λ4
Λ5
Λ6

χ.π.

1) Λ1
2) Λ2 Λ3
3) Λ4 Λ5 Λ6
4) Λ1 Λ2 Λ3 Λ4 Λ5 Λ6
5) Λ1

Ασορνδιακό

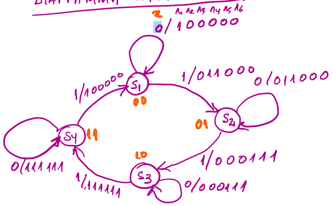
inputs : x
states : S1, S2 S3 S4
outputs : Λ1 Λ2 Λ3 Λ4 Λ5 Λ6

x = 0 παραμένει το δέντρο ως έχει

x = 1 το δέντρο προχωρά στην επόμενη κατάσταση

S1 :→ είναι αναμμένο το Λ1
S2 → " " " Λ2 Λ3
S3 → " " " Λ4 Λ5 Λ6
S4 → " " όλα

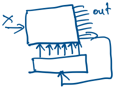
ΔΙΑΓΡΑΜΜΑ ΚΑΤΑΣΤΑΣΗΣ


x
Λ1 Λ2 Λ3 Λ4 Λ5 Λ6
0/100000
1/011000
0/011000
1/100000
00
01
11
10
S1
S2
S3
S4
1/000111
0/000111
1/111111
0/111111

ΚΩΔΙΚΟΠΟΙΗΣΕ ΤΑ S1 S2 S3 S4

Ιωαννα:

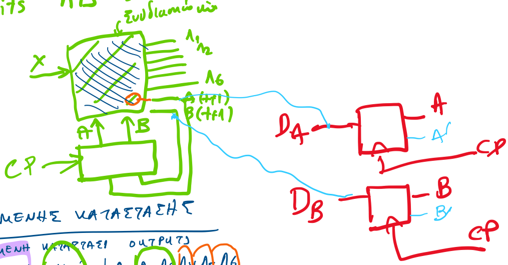
S_1 100000
S_2 011000
S_3 000111
S_4 111111



ΔΥΟ BITs ΑΡΚΟΥΝ ΓΙΑ ΝΑ ΑΝΑΠΑΡΑΣΤΗΣΕΣ: 4 states

επιλέγω τα bits AB state

AB
00 → S_1
01 → S_2
10 → S_3
11 → S_4


συνδυαστικό
X
Λ1
Λ2
Λ6
A(t+1)
B(t+1)
A
B
CP
D_A
A
A'
CP
D_B
B
B'
CP

ΠΙΝΑΚΑΣ ΕΠΟΜΕΝΗΣ ΚΑΤΑΣΤΑΣΗΣ

			ΕΠΟΜΕΝΗ ΚΑΤΑΣΤΑΣΗ		OUTPUTS					
A	B	X	A(t+1)	B(t+1)	Λ1	Λ2	Λ3	Λ4	Λ5	Λ6
0	0	0	0	0	1	0	0	0	0	0
0	0	1	0	1	0	1	1	0	0	0
0	1	0	0	1	0	1	1	0	0	0
0	1	1	1	0	0	0	0	1	1	1
1	0	0	1	0	0	0	0	1	1	1
1	0	1	1	1	1	1	1	1	1	1
1	1	0	1	1	1	1	1	1	1	1
1	1	1	0	0	1	0	0	0	0	0

ΦΤΙΑΧΝΩ ΤΟ ΣΥΝΔΙΑΣΤΙΚΟ ΚΥΚΛΩΜΑ ΠΟΥ ΠΑΙΡΝΕΙ ΣΑΝ INPUT A B X κ' δίνει 8 outputs

A(t+1), B(t+1), Λ1, Λ2. . . . Λ6

A(t+1)

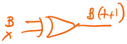
A \ BX	00	01	11	10
0	0	0	1	0
1	1	1	0	1

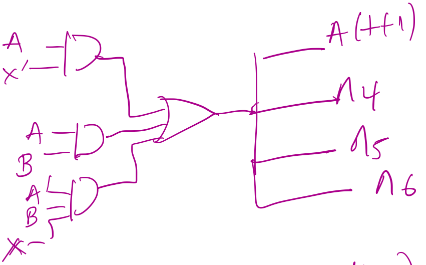
$A(t+1) = AX' + AB' + A'BX$

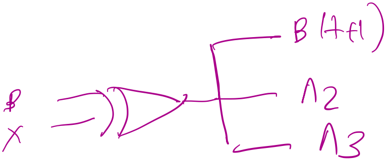
B(t+1)

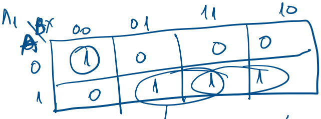
A \ BX	00	01	11	10
0	0	1	0	1
1	0	1	0	1

$B(t+1) = B'X + BX'$

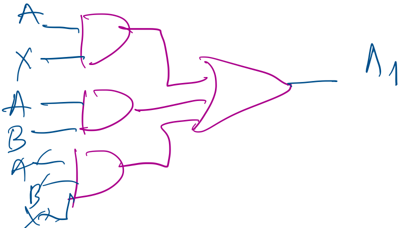



A
X'
A
B
A
B
X'
A(t+1)
Λ4
Λ5
Λ6




A1
AB
X
00
01
11
10
0
1
1 0 0 0
0 1 1 1

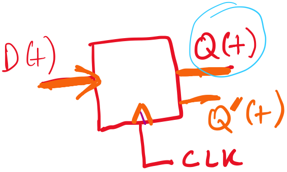
$A_1 = AX + AB + A'B'X'$



ΝΑ ΦΤΙΑΞΕΤΕ ΤΟ ΚΥΚΛΩΜΑ ΑΥΤΟ ΜΕ ROM ελάχιστων διαστάσεων

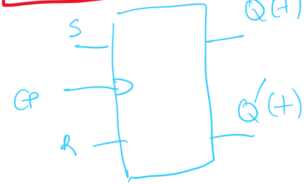
FLIP - FLOPS

D- Flip Flop



$Q(t)$	$D(t)$	$Q(t+1)$
0	0	0
0	1	1
1	0	0
1	1	1

RS Flip Flop



S=1 R=0 Q(t+1)=1

S=0 R=1 Q(t+1)=0

S=0 R=0 Q(t+1)=Q(t)

S=1 R=1 απροσδιόριστο

$Q^{(t)}$	$S^{(t)}$	$R^{(t)}$		$Q(t+1)$
0	0	0	–	0
0	0	1	•	0
0	1	0		1
0	1	1		απρδο
1	0	0	–	1
1	0	1	•	0
1	1	0		1
1	1	1		απροσδιόριστο

JK Flip-Flop

$J=0 \quad K=1 \rightarrow Q(t+1)=0$

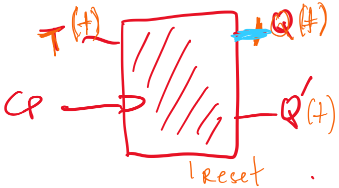
$J=1 \quad K=0 \rightarrow Q(t+1)=1$

$J=0 \quad K=0 \rightarrow Q(t+1)=Q(t)$

$J=1 \quad K=1 \rightarrow Q(t+1)=Q'(t)$

$Q^{(t)}$	$J^{(t)}$	$K^{(t)}$	$Q(t+1)$
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

T Flip Flop


T(t)
CP
Q(t)
Q'(t)
Reset

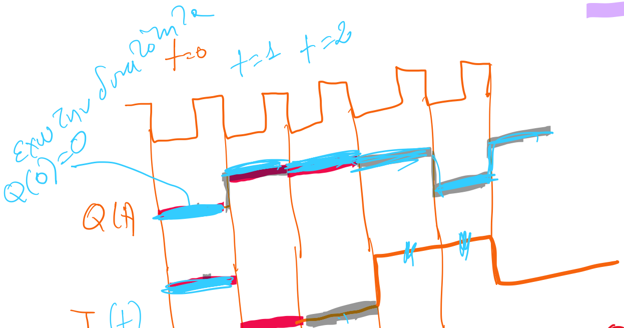
Q(t)	T(t)	Q(t+1)
0	0	0
0	1	1
1	0	1
1	1	0

T=0 μην αλλάξεις το Q

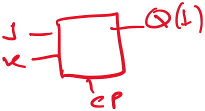
T=1 άλλαξε το Q

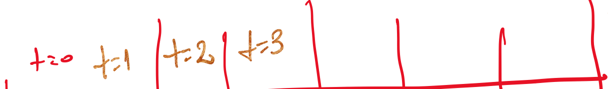
1) Πως φτιάχνονται FF.

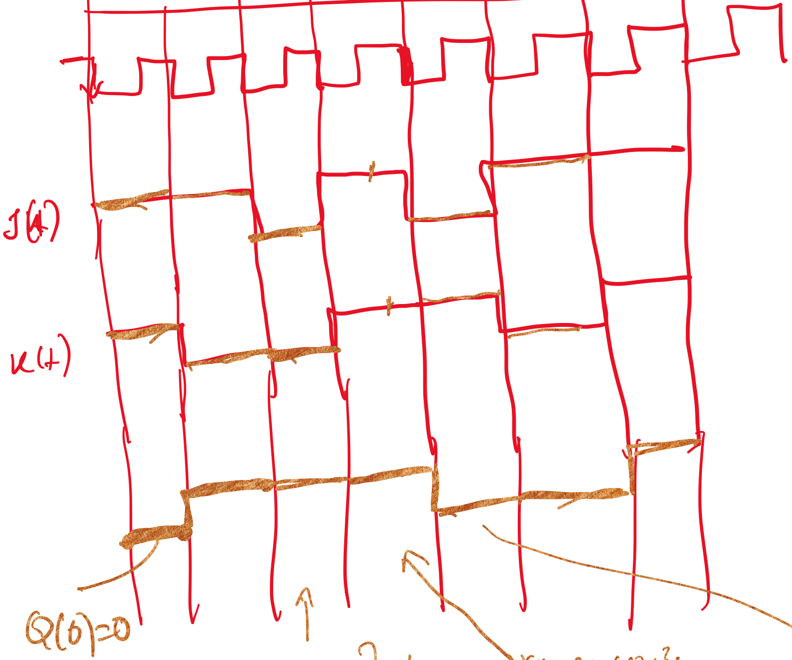
2) Πως χρησιμοποιούνται σαν ακολουθιακά κυκλώματα


Έχω την δυνατότητα
Q(0)=0
t=0
t=1
t=2
Q(t)
T(t)

επίλεξε τυχαία είσοδο για κάθε παράμετρο





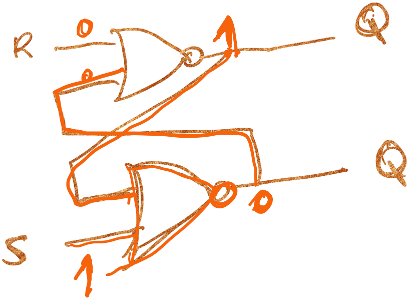


όχι ήταν να το αφήσει

να το αλλάξει

να το κάνει
0

RS latch

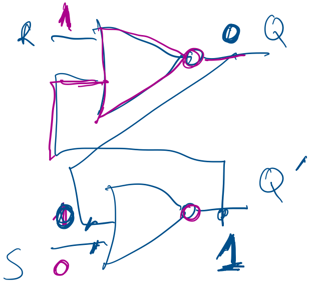


S	R	Q	Q'
1	0	1	0

✓

Εχει feedback

S	R	Q	Q'



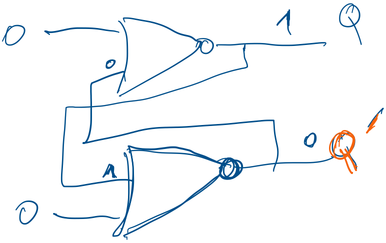
0 1 0 1

✓

S R

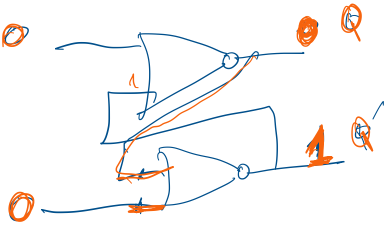
0 0

Q = 1 ⇒ Q = 1



S R
0 0

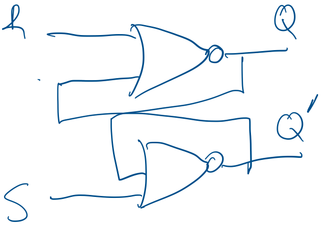
Q = 0 ⇒ Q = 0



S R

1 1

Q = Q' → 0 απαγορεύεται



S R	Q Q'	
1 0	1 0	εαν ηταν
0 0	1 0	Q = 1
0 0	0 1	Q = 0
0 1	0 1	
1 1	απαγορεύεται	