8.00

9.00 31/05 :- Finite Cellular Automata

10.00

$A = (\alpha, S, N, f)$

11.00

12.00 $\alpha \subseteq Z^D$; α is finite

13.00

14.00

8.00 # Boundary Condition

9.00 - Open boundary condition

10.00 - Periodic boundary condition.

11.00

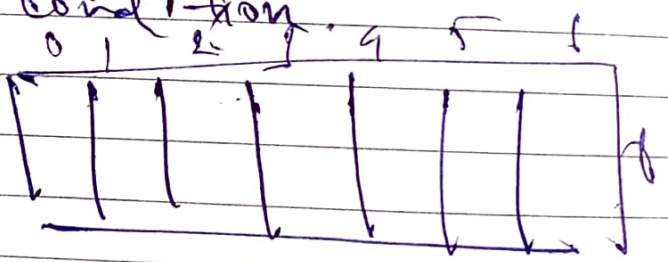
12.00 $\Sigma = \{0, 1, 2\}$

13.00

14.00

15.00 ## Open Boundary Condition

16.00 Null boundary condition.



17.00

18.00

Eve. 111 110 101 100 011 010 001 000 [Domain]

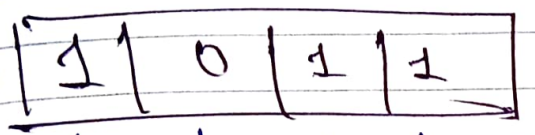
0 0 0 1 1 1 1 0 [Co-domain]

= 30

Appointments

8.00 $n = 4$

9.00 1)



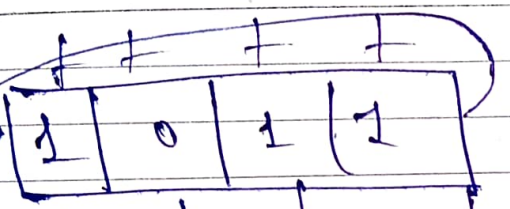
IC [Initial]

10.00

11.00 1 0 1 0

NC [Next ~~Null~~ B. cond]

12.00 2)



[Periodic Boundary]

13.00

14.00 [110] [101] [011] [111]

15.00 0 0 1 0

16.00 * Boundary Condition does matter.

17.00

18.00

Eve.

14 THURSDAY

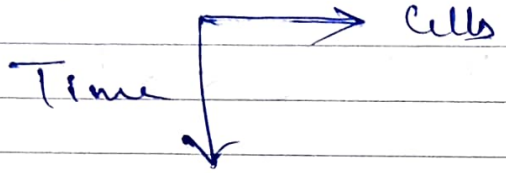
CA can be Moore Machine

Appointments

8.00

Space - Time Diagrams

9.00



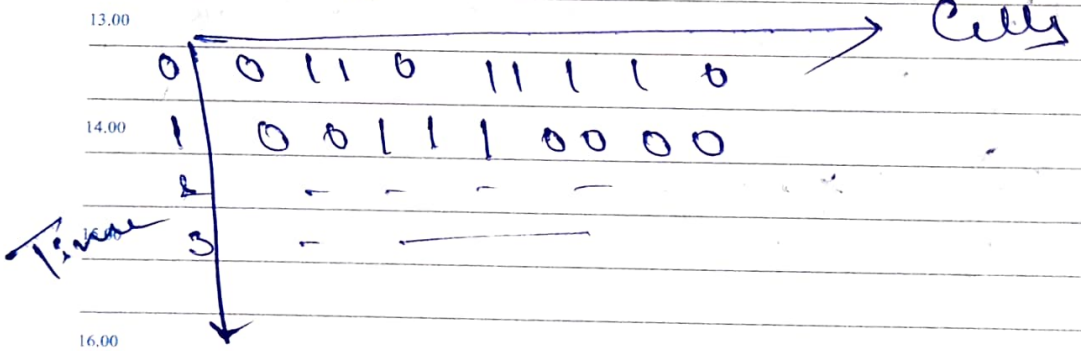
10.00

11.00 D - dimensional CA

Space Time diagram is a (D+1) dimensional diagram.

12.00

13.00



14.00

16.00

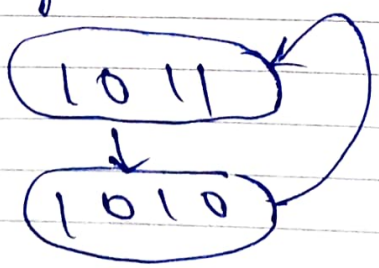
17.00

→ Transition diagram

18.00

Prof. Pal Chowdhury considered CA as FSM. even though it is as powerful as TM.

Eve.



JAN 2021 F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

8.00

Global Behaviour

9.00 ① Reversibility - Time Reversibility

10.00

Bijective

11.00

12.00 $y = F(x)$

13.00 $x = G(y)$ $G = F^{-1}$

14.00 $x = F^{-1}(y)$

15.00

If F is bijective then only F^{-1} exists.

16.00

17.00

A CA is reversible iff its global transition function G is bijective.

18.00

Eve.

Th: If a CA G is bijective then G^{-1} is also a CA

2021

16 SATURDAY

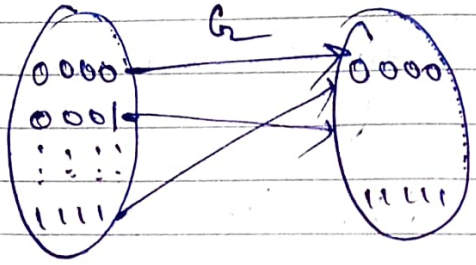
Is the universe a CA?

Week - 3rd • 016/3

Appointments

8.00 $G_R : C \to C$ $\quad G_R = \{0,1\}^n \to \{0,1\}^n$

9.00 $n = 1$



10.00

11.00

12.00

$y = G_R(x) \quad x = (x_i) ; i \in \alpha$

13.00

$y = y_i ; i \in \alpha$

14.00

15.00 $G_R(x)|_i = y_i = f(x_{i-1}, x_i, x_{i+1})$

16.00

Evolution between ECA 30 with null boundary

17.00

18.00

0 | 0 1 1 0 | 0

Eve.

17 SUNDAY

1 1 0 1
1 0 0 1
1 1 1 1
1 0 0 0
1 1 0 0
1 0 1 0
1 0 1 1

Rule 30 not bijective

JANUARY 2021

Week - 4th • 018-347

MONDAY 18

Appointments

8.00 Using rule 30 we are climbing from

9.00 one configuration to another.

10.00

Or on the other hand maps the domain

11.00 and the co domain of the configuration.

for any n.

12.00

13.00 If G_r is bijective then G_r^{-1} exists.

14.00