Discrete Maths

State in Fsm

state represents a summary of the history of the machine.

Two states are equivalent of they represent summaries that one equivalent cidentical) as for as the terminal behaviour of the machine is concerned.

Surp in grafly Equivalent states within agricen machine can be combined situal changing the terminal behaviour of the machine. less tue number of Moveover, States, loss is going to Ge implementation a maintenance

con so proved mationatically.

How do we find states (2 or more)
one equivalent?

can we say anything based on their output?

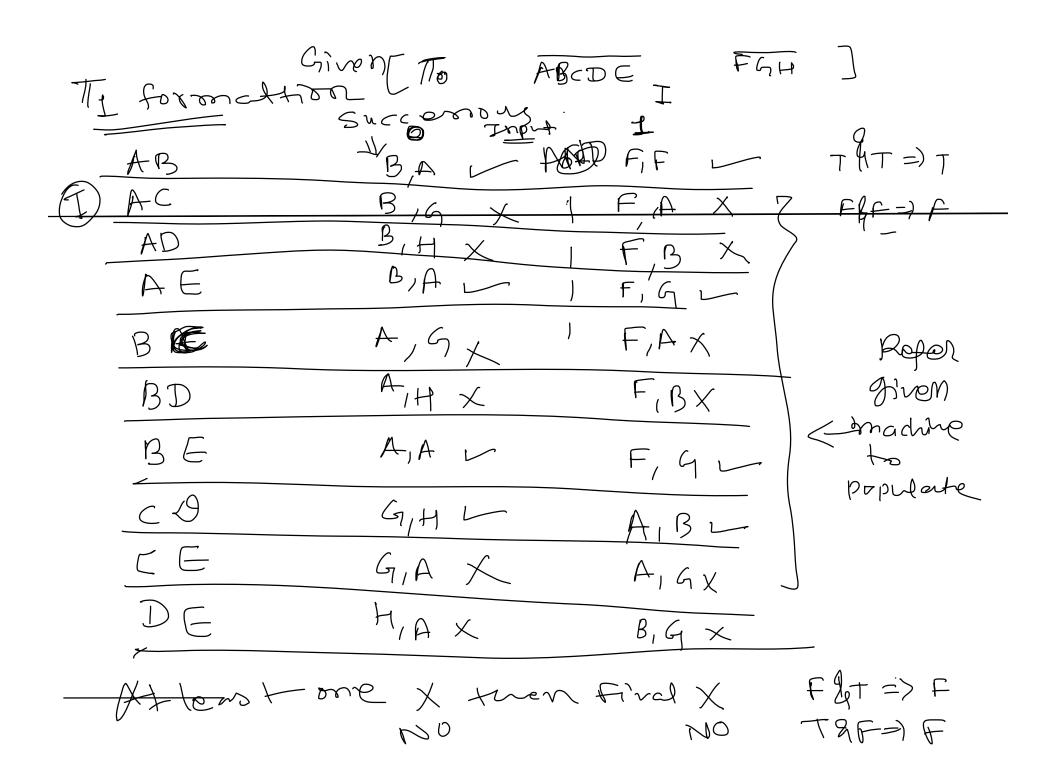
Ideally, an exhaustive examination of all possible input sequences of additnary length is required.

what can we do to avoid extraustive? Two finite state machines are said to be equivalent If, Stanting from their respective initial states, they will produce the same ontput sequence when they are given fine same input 5 eg vonce

In steen words, equivalent machines bave identical terminal behaviors eventlying their internal structures might be different. Petrol or CNG or LPG all drive car engine 60 motion.

	Input 0 1			TT0
State	В	F	0	- EABCDE FAH)
B	A	AF	\bigcirc	T 1
	G	FA		<u>ــــــــــــــــــــــــــــــــــــ</u>
D	<i>⊢</i> ₹	В	0	S ABE CD F GIH]
E	\land	G		
	H		1	$T_2 =$
9	A	- D	1	E E
H	A		1	F GRZ

Two steets are in the same block in The it and only it they one in the same block in TIK-1 and Efor Cenery) input hetter teen successors are in the same block in That is it there exist at least one input letter, it the successor is not in same block then currently they can not be together.



HAX

NO

FH

HAX

NO

GH

AA V

YES

AB E

 \overline{CD}

GH

Given TonTI In TI, Will be together ABE Input 0 Yes No F, G 00 BC machine CD A,B

The FAB E CD F GH

When should we stop?

A B E C D F G H

Exhaustive?

when there is no difference From Tk to Tky Stop Vory much like Improved Bubble sort Whore two iterations do not have further exchange we don't go all iterations. As data is already sorted.

TIZ calculare TI3 Will stay hypethe 29 AB 6 *f* CILI TTI A same as T3. Stop What is judgement 9

Instead of 8 original states (A-H) tre same machine can be developed using 5 states.

Aneas O Given a single machine tom to reduce states Emachine with more of leen steeles both are equivalent mattines 2) Given two different machines find out teney are same Or NO+ 8 MA => MA reduced Compare. mB => mB reduced ma and ms are equivalent.

State of 1 output

AB (A') AB (A') FF (D') O

CD (B') GH (E') AB (A') O

E (C')
$$AB$$
 (A') GH (E') GH