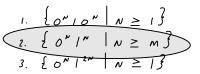
EECS SIO INTRO TO THEORY OF COMPUTATION ASSIGNMENT OF

MONDAY SEPT 19 2022

PROVE THAT ONE OF THE FOLLOWING LANGUAGES IS NOT REGULAR



REGULAR MEANS THERE A DFA FOR THE LANGUAGE.

PROOF BY CONTRADICTION:

DE.

SUPPOSE THE LANGUAGE L := { O" |" | N = M } IS REGULAR, AND THUS = D := { DEA} FOR L.

SUPPOSE THAT D HAS N STATES

LET WEL, W= O"1": D ACCEPTS THE STRING W

THUS THERE MUST BE A REPITITION IN THE PREFIX "O", BECAUSE THERE ARE NO. 2 N STATES

READING N TRANSITIONS LAUSES N+1 STATES YISITED

REPETION IS AS FOLLOWS

00000001 = W

IF YOU TAKE STRING W AND REPEAT Y THICE THEN $y \neq e$ 1 $y \geq |$ OS IN IT, HOWEVER THIS MEANS THAT THERE ARE GREATER THAN N+1 OS IN THE STRING, AND ONLY M | S. WHICH CAUSES A CONTRADICTION.

THEREFORE L IS NOT REGULAR

EECS 510 INTRO TO THEORY OF COMPUTING

ASSIGNMENT OZ

MORGAN BERGEN

2. GIVE A REG EXP FOR THE BINARY STRINGS WHOSE NUMBER OF OS IS DIVISIBLE BY S

DFA WHERE N=5

Jo: Qo x \sum Q

DESIGNING A DFA WHERE ω mod S=O , ω %. N=>R CAN LEAD US TO THE EXP. T

3. GIVE AN ENGLISH LANGUAGE DESCRIPTION OF THE REGULAR EXPRESSION (0 + 1 +) +000 (0+1) +

THIS IS A REGEXP FOR STRINGS CONTAINING AT LEAST THREE Os L = { 000, 0000, 0001, 00000, 00001, 0100, 1000, 0010, ... }