N=0 X LUJ HNUX July 12 ying DFT & Gam + byens 30/10/20 20 Friday P,NP, NP-complete Problems: - An algorithm solver is whothern in polyneme Introduction time if its worst case time efficiency belongs loney there to O(pon) where pon is a polynomial of the are few wife phoblemis input styl in. Example - n, logn algorithm, m have day > \$] Lo Problems that can be solved in polynomia Note :time use called tradable and problems that Even though cannot be solved in polynomial time we will knapsack (nw) Looks like tractable intractable. When I now both Decision problems - problems which que microsce, it take YOU (NO (T/F) OS SOLUTION P- class :be lidved in polynomial time be Informally, we can think subout > non-tractable problems that can be solved in polynomial combinatora) time as the set that "compelet science PROBLEM] theoreticians call P. If a problem Count be so Ived L, All decision problems front conte solved in Polynomiat extensitionly variet for polynomial time) are in P. b'class P'us a class of desussion that can be solved in polynomial time by Cathemenitic) algorithms. This class of prostems is called to hynomial. 1) Decidable and underidable Problems → Deterministic algorithm: Giren an valgorithm hand a particular i/p, what it aways produces the same couldn't is call ers a deterministre algorithm. Jalsorten > (voru) -> Non - deterministre algorithm: (Eg: Randomiyed algorithm) given an algorithm and a particular it. even the Mp same everytime, it gives tifficent outputs.

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Bloking factor からずの一 all indies -> Randomised Algorithm: [Rando mised 190 + a particular olynoma Index fix 8.1 Here in Additional to 1/p, a let of handom notabity give a Longs proper output] numbers are taken, do the instructions exceeded gets valy thence ofprasies too. The During execution, the \$45 behaviour can vary if the est takes random choices depending on those algorithm sums sandom number.] multible times Inon 16 on same input. alled Even though some problems can't be number solved in polynomical time, it may have a edecesion western Fggive All optimisation can't be solved in poly nomical. But if it can be reduced to decision problem then it can be solved in polynomial eg. Travel salesman problem -m+ N-1 I Hs decesion version can be solved in Folynomial + the] X(2) NN adl 31/14 2020 Delaton Arobiem Soturday. 2(4)WN undecidoble. Decidable DET forcessy. D. PRoblems than Deuston Problems that can be solved by can't be solved by an an algorithm in algorithm in a periodic sequen polynomical time. polynomial time fains DET fying -> rant he solved using del-algo in PT NP PROBLEM > (1) Hamiltonion d'Rouit Problem : Decesion counterpeut commissional & Decesion Counterpart (3) Knapsack problem: Decision counterpart @ : factition problem: - aron'n' + re integers, determine whelker H is possible to partition them called into a disjoint isubsets with the same sam. anew) Eg: - {1,2,3,43 Hmm? 81,43 {2,33 sum should be same 4 (5 = 5) Lule

m no ferrent quenza counter part EVIER CIRCUIT com be solved in polynamical time :00 of Euter cercuit Latast from a vista , visit every edge exactly once and Whether Euler return back to the same vister] - (EULER circuit) curcuit exists in a graph (a) nut Shortcut . If degree is even for all vertices, then we In a giron graph can conclude, that the graph has Euler concluit. CLOSS NP 4 non-deterministic algorithm is a Boms ar 2-stage proceduce that takes as its input an 1/0-graph instance I of a decision problem and does (i) Bling S المتعا مر العباد the bobboaring :is - Nondeterministic ("guessing") stage: - An abbitrary story s is generaled that can be thought of as a candidate solution to the given instance I. 40 0 15/N (in - Deterministre (" Verification) stage: - A deterministic algorithm takes both I and I as 1/P 111 This gar Ma odn and outputt yes if I supresents a solution to an Instance I - Corgo wed here is in P) bolt A 2nd Hale by A hondeterministic algorithm solves a DINOL H idectsion problem if and only if you every yet MIGO instance of the problem ut settlern & yes on some execution. o nondeterministic algorithm to be rapable of " guessing " a solution at least and and to be able to verify its validity. 4 A nondeterministre algorithm is said to be non-determinister polynomial of the firme effectioney of its vaitreation stage is polynomial

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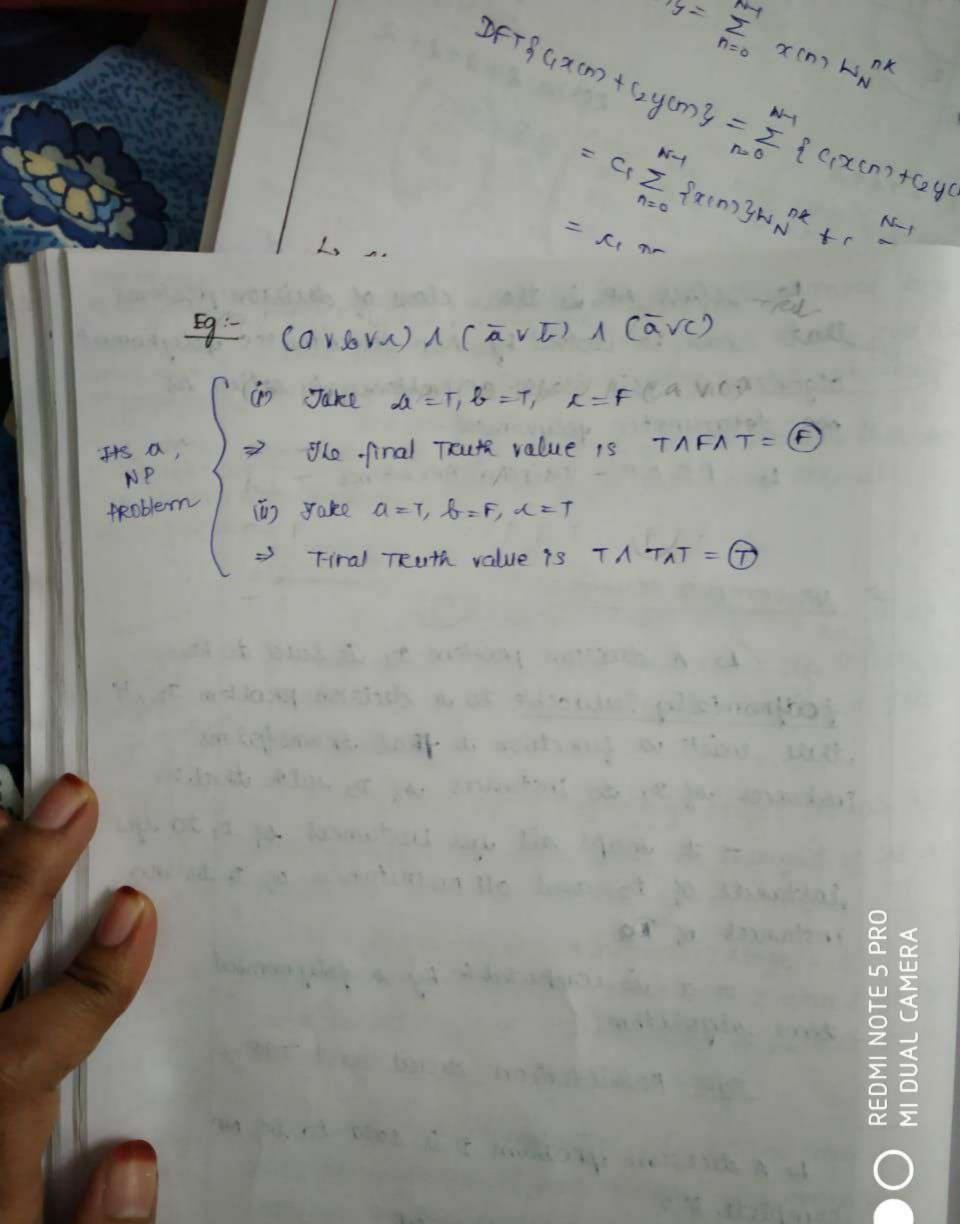
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Course !