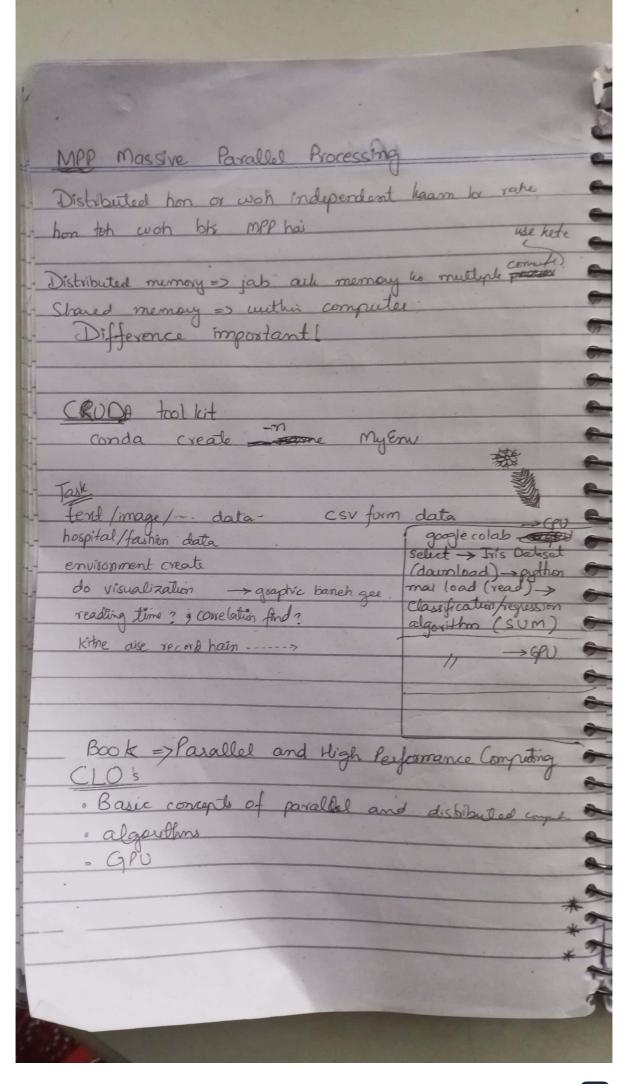
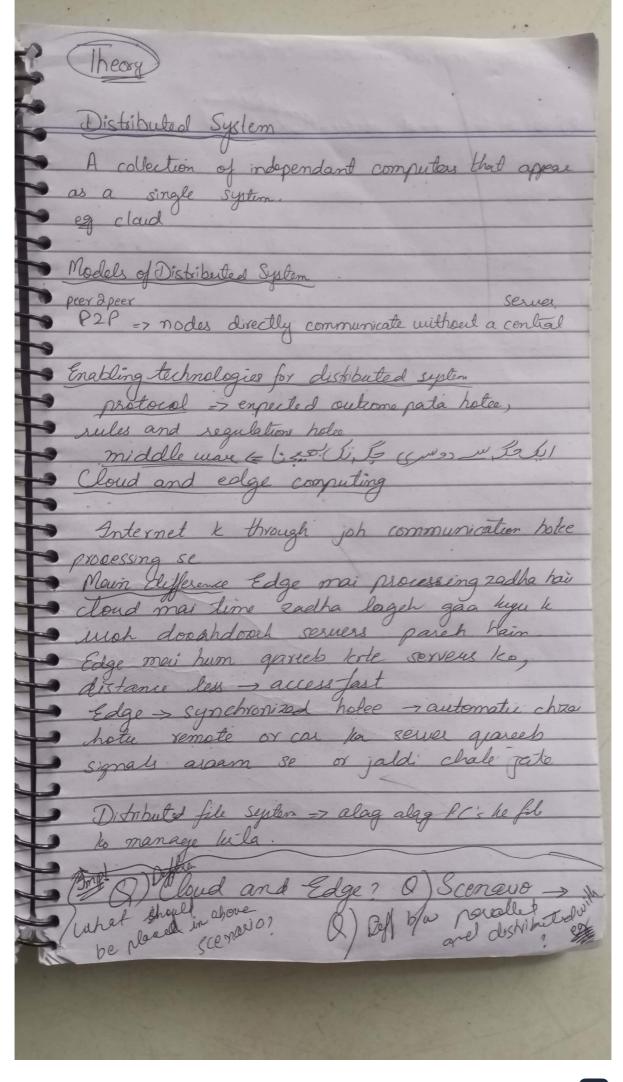


Parallel - los cost, slow Destibuted = expensive, management required, by Two by multiple Parallelism =7 need + 1. task (set of instructions) (vaw for of information) Bet - level =7 lax Parallelism independent tasks Heterogenore week load & 6 (Sol) load 6 task Communication (independent) . (320 f controls (always Advantages and Challenges can handle heterogenous morkload Challenges managing intertest and synchronization task scheduling complen with fort pur plan when table depend on each other 5 baskers task scheduling is good when tasks are integented

Thread => subprocess Multiple thread => process is divided into multiple news and enecute after combing void main () Threading Mulliple threading Task scheduling void get data (Clock related / instruction get data () Data Parallelism on distributing data and responsing same De same operation (calculate op) Distributed - joh duse PC's ho josh her her there Shared - ail he to hum share lite apas moi Challenges Dates depend he raha parallelin nahi hogee Synchronization nahi hogee Hybrid = 7 pb donah mil kr kaam Conclusion Data => large data sets Task -> different tasks

eveny => multiple instructions at some NXN 2 matrin threas, process Cstibrary. 2 x5 + 4 x6 ONXN (2) random. Thungy library 3 dot1 for memorizing the code se time um aya algorithm rai theading rahi Data barka hona chahiye for Best Result





LAB -> OUR concern is performance (how to imposite) not to learn the cade of Classifich Commands 3 · conda create -- name env python = 3 to · conda aictivato env o conda install -c conda CPV or GPV to performance dekhni Library - Tensor flow CPU or GPU la aile dusse le sath supportue ho training (feed lite boar boar) => use training ophnization algorithm X 2 Comparison of OPV and GPV Engeriment 6. 6 performance pre explaised « CPU per kitna time lota synchronize (PV or GPV to be he Assignment any algorithm and synchronistor was (hyberd)

HEORY Why Parallel Computing? is played in challege of -> computational pourer jab zadha chahiye hoter Parallel Computy execution of many operations at a same time - Maximum computational piour Handle large problem > Simulation speed barka salte Social =7 problem hoter has or processor hote Parallel - bare problem ko chote tukeon mou forhna or phr solve he The fold smultaneously of wals fasts will parallel & a dependent is a postaske Cus fil (iden of computing Application and Result less pourer consumption large data set per time sadha lagta toh energy sadha lagter is se si s energy effroery so) problem sine Why learn parallel computing? o progress operformance ashi nati these o clock filquency back gays hya I processors. bhi borsh gaye

Clock : instruction enecute per second. -> Computational pourer agai hum sahi se nahi leh rahe or hardware bot acha hai toh is ka koi faida nahi hati Sevial do-payrol() data aya - instruction mai split hera - processor Parallel teshs ho divide kella => Definition imp! Amdahlis law Speedup (N) = 1 /(S+P/N) fined problem => depends of no of processors P=7 parallel, S=7 seval N=700 of processor l'instation serial to Spaulld on to in speed Cor jus of respondence per farg parta seval part se Stong staling Q) Refination? Limitations? Impli Guast afson - Barss -7 N = N - S* (N-1) problem \$ -> processes 1 -> wording

Benefits Sine 1 -> divide -> different processors -> time T -> This improved scalability weak scaling => time radha lagoda eneration of processors mai joh time lagta with no of processors mai lagta. Strong: - problem divided - fored across processor · speed up calculation. Pasallal computy July o is to (3 is to c) is in formatione · source code · Compiler manages execution on hardware Data vectorization aisa koi jaam heen joh sab data per apply hagaye Expraction = 7 3 x 3 => overall matrin + 1 km Benefits Ofaster computation @ optimized for array operation (eg NumPy)

Categořing Parallel approaches kese categoroze le sabte of enute date of his time Is SIMD => GPU & mai hotel Zadho MISD =7 Space craft mai thate.
fault-tolerant => & cr/ as 20 7-fault 39 MIMD -> data or instaution ke parallelien SIMI -> different data per operations hele Parallel speadup vs Comparative Speedup Content Problem ha puta hona chaige, toh usi se hum achi performance hir salte. Assignment -> steam processing - (3) ruse (5" (1) - 1