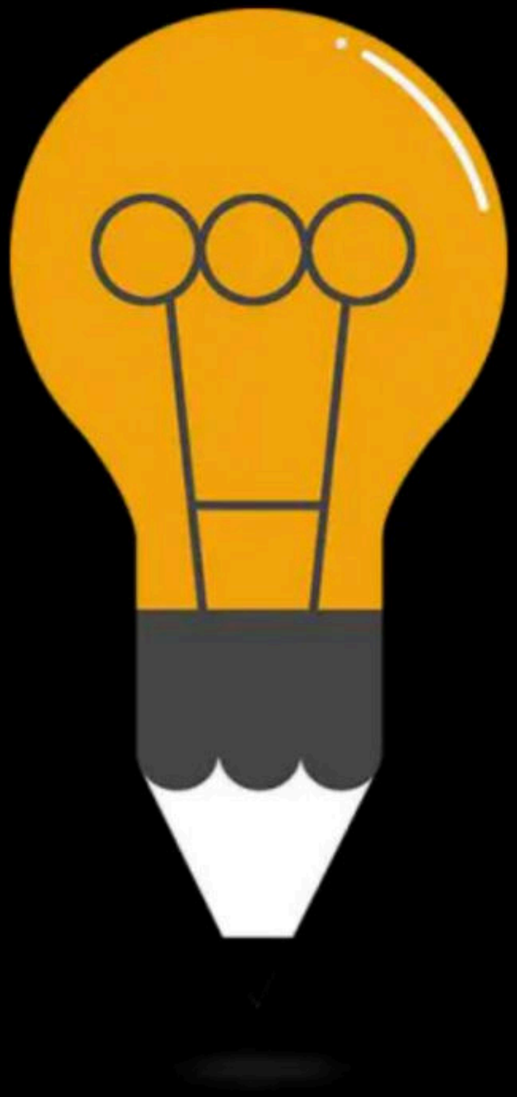
Introduction to DBMS

Complete Course on Database Management System

Vishvadeep Gothi • Lesson 1 • July 28, 2022



DBMS
Basics

By: Vishvadeep Gothi

Vishvadeep Gothi

- **GATE Ranks:**
  - 682 (2009) – 3rd year
  - 19 (2010) – 4th year
  - 119, 440 etc.
- **Education:**
  - ME from IISc Bangalore
  - Mtech from BITS-pilani in Data Science
- **Work:**
  - 15+ Year Teaching Experience
  - 11+ in GATE/IES (GateForum, Gate Academy, ACE)
  - Worked in Cisco, Audience Communication
- **Professions:**
  - Freelance S/W developer
  - Educator
  - CrossFit Trainer

→ Teach (mon- fri)

→ self-study (revise, make notes)

→ dpp (homework Questns)

→ solve in self-study

→ 4th class only doubt

→ All dpp Questn + doubts

→ weekend Quiz

→ Revise & attempt

→ After every chapter i will give PYQ

→ PYQ discussion

→ End

↳ Mega Quiz

Course Structure

Topics
Basics
DBMS Designing
E-R Modelling
Relational Database Design
SQL
Relational Algebra

Data

✓✓ Data is everything

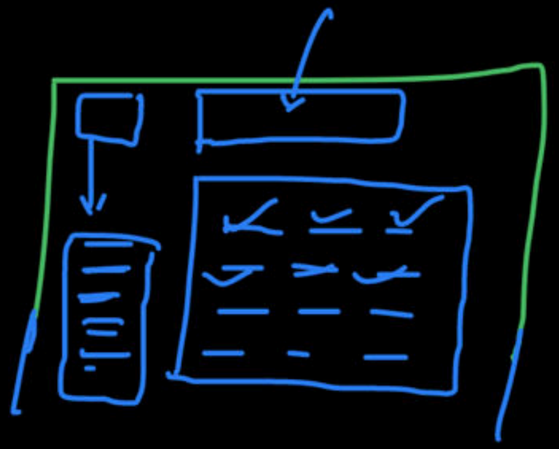
current ⇒ data processing is everything

Database

The collection of data, usually referred to as the database, contains information relevant to an enterprise.

DBMS

A database-management system (DBMS) is a collection of interrelated data and a set of programs to access those data.



DBMS

Goal of DBMS:

1. Providing a way to store and retrieve database information that is both convenient and efficient.
2. Ensuring the safety of the information (providing security)

DBMS

“Information is important for most organization”

DBMS

“Information is important for most organization”

What should we do as CS experts??

DBMS

“Information is important for most organization”

What should we do as CS experts??

Develop a large body of concepts and techniques for managing data

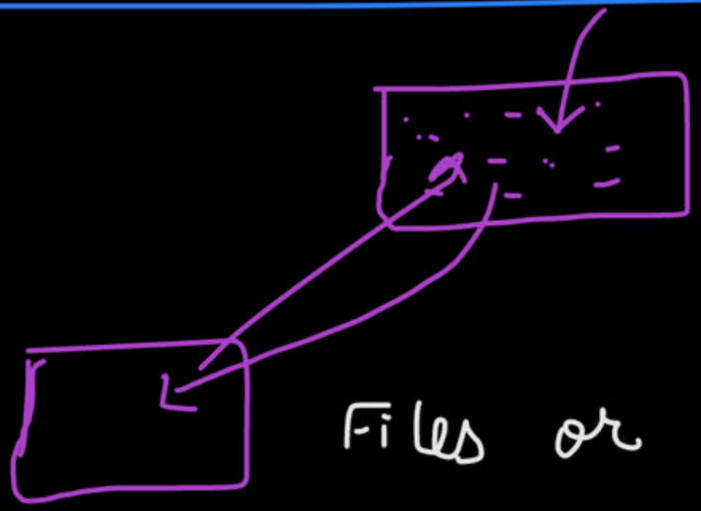
DBMS Applications

Needed for Data science and machine learning also

- Unacademy (Ed-tech)
- social-medias
- E-commerce websites
- weather infⁿ
- Banking
- sports infⁿ web
- OTT
- stock market
- schools, hospitals ...
- News portals
- Railways
- Govt. offices
- Ticket Reservations

But Why DBMS?

it has many-many advantages over conventional data-storage techniques (in files)



Files or Database

But Why DBMS?

Disadvantages of File System:

1. Data Redundancy and Inconsistency
2. Difficulty in Accessing Data
3. Data Isolation
4. Integrity Problems
5. Atomicity Problems
6. Concurrent-Access Anomalies
7. Security Problems

Redundancy & Inconsistency

customers

- → ID
- → name ✓
- → add.
- → country
- → phone no.

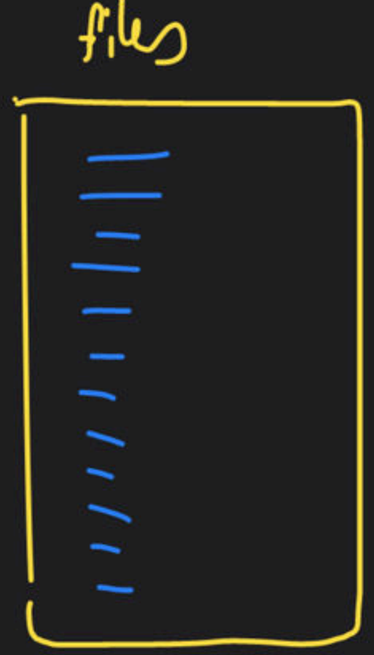
Suppliers

- → ID
- → name
- → product
- → price
- ⋮

order

- → customer ID
- → customer name ✓
- → product
- → supplier

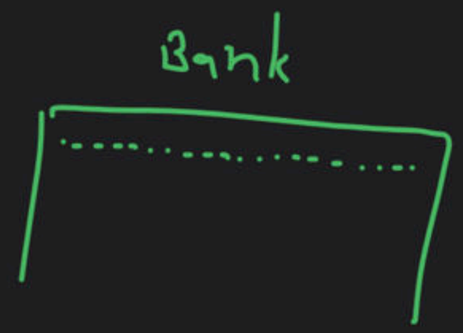
Difficulty in accessing Data ✓

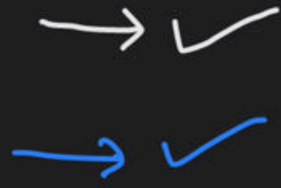


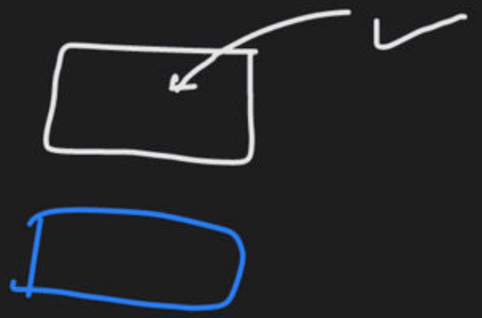
To access any specific content

⇓

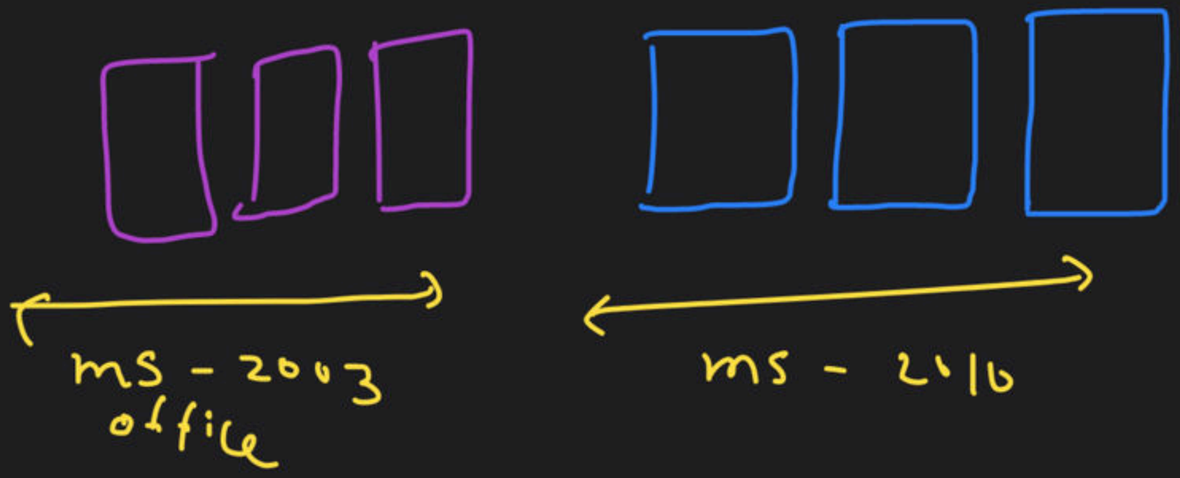
write a program







Data Isolation



Data into diff. types of files

⇓

Collecting Data from them

Integrity problem

files

↓

for each constraint

⇓

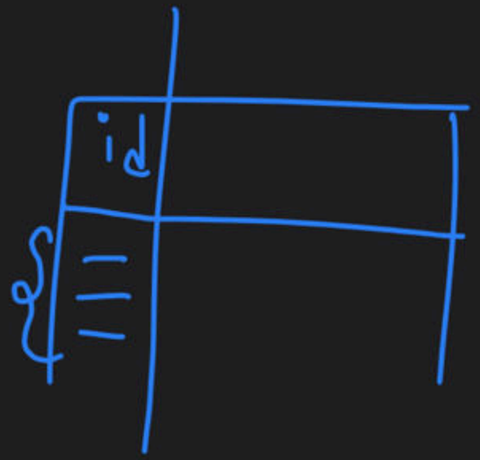
code or prog.

Account

Database

↓

DBMS handles automatically



Atomicity

word meaning ⇒ " all or none "

Acc :- ~~5000~~
3500

Company = 100000

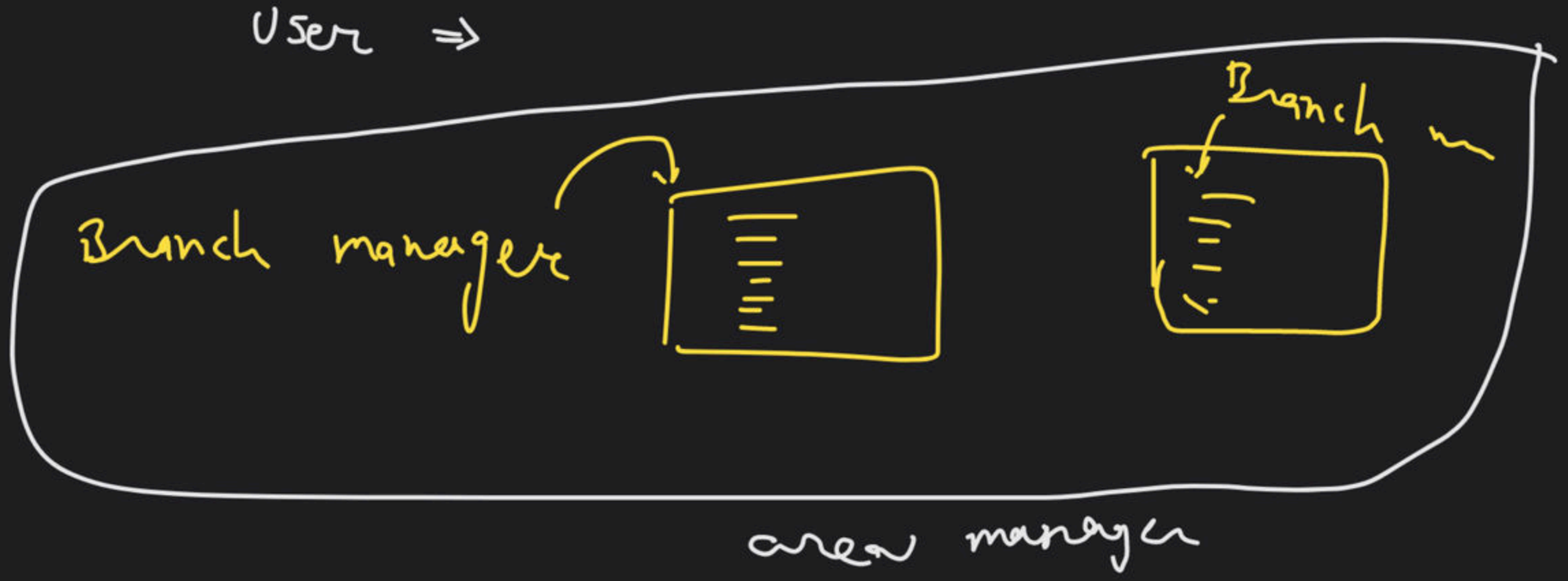
Concurrent Access Anomalies

final => 20000

or

15000

Security



Instance and Schema

Database Languages

1. Data-Definition Language (DDL)
2. Data-Manipulation Language (DML)

Database Languages

1. Data-Definition Language (DDL)
2. Data-Manipulation Language (DML)
    I. Procedural DMLs
    II. Non-procedurals (Declarative) DMLs

Database Languages

1. Procedural DMLs:

   Require a user to specify what data are needed and how to get those data

2. Non-procedurals (Declarative) DMLs

   Require a user to specify what data are needed without specifying how to get those data

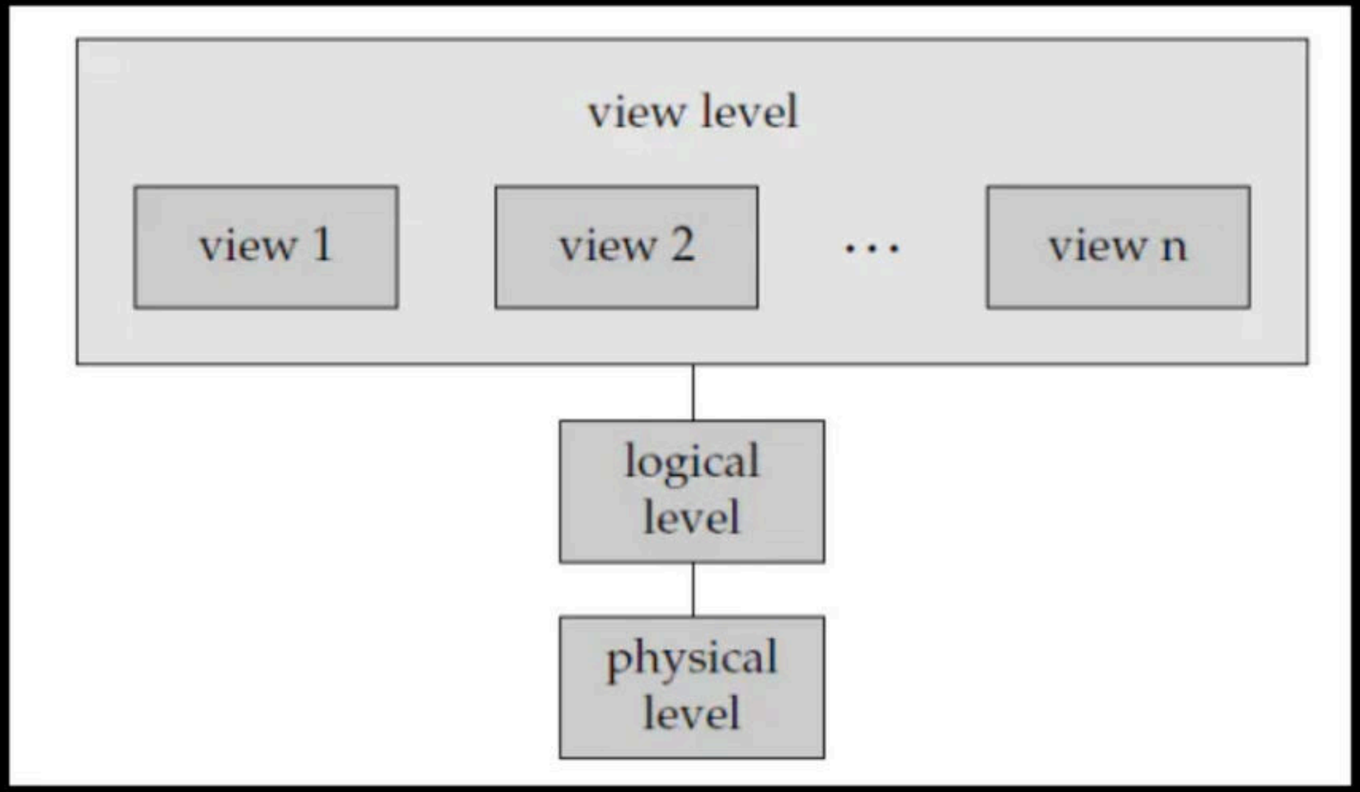
Database Users and Admins

1. Naive users
2. Application programmers
3. Sophisticated users
4. Specialized users
5. Database Administrator

View of Data

1. Physical Level
2. Logical Level
3. View Level

View of Data

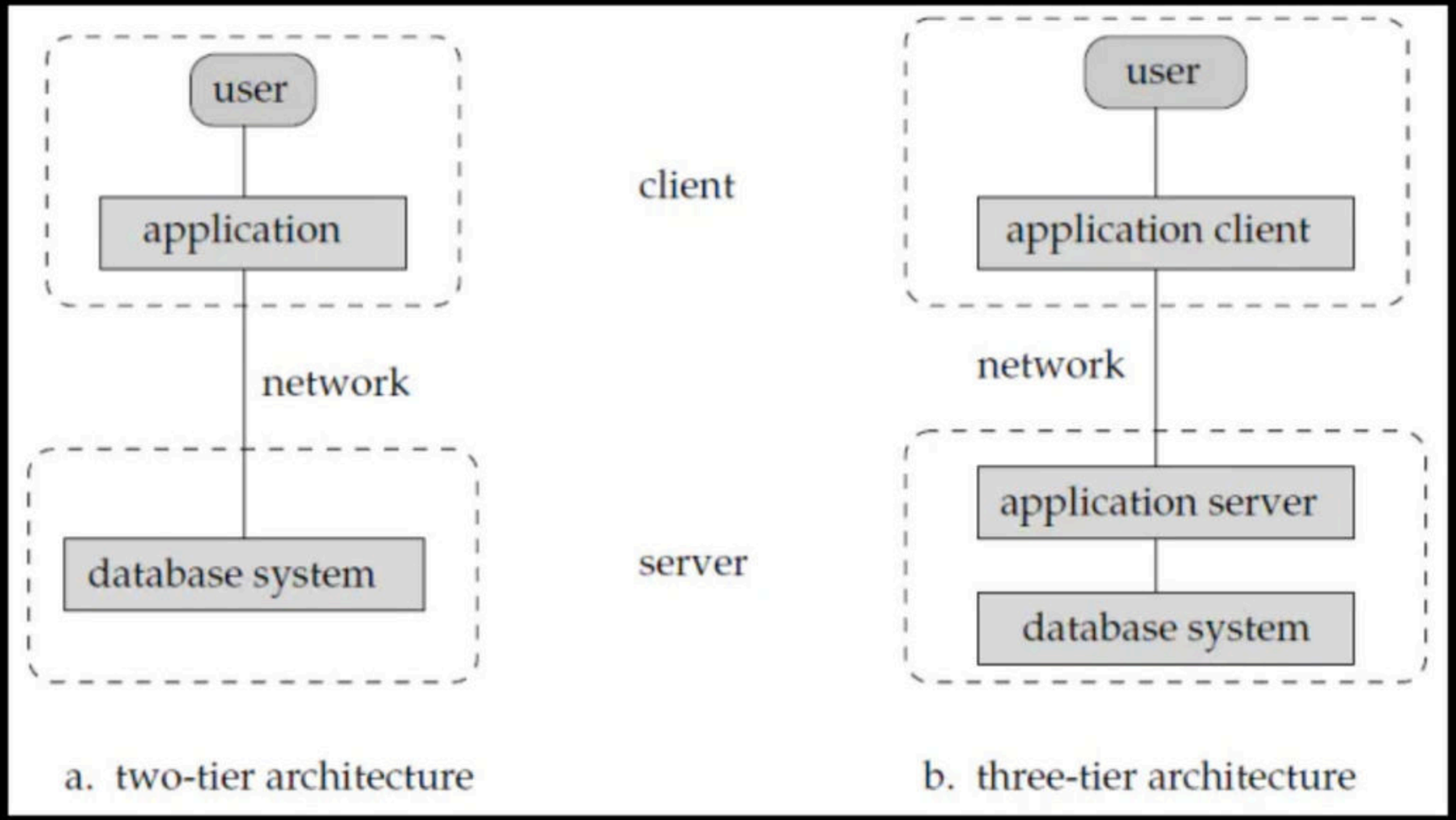


Database System Structure

The functional components of a database system

1. Storage manager
2. Query processor components

2-Tier & 3-Tier Architecture



Happy Learning.!

→ BV Reddy sir – digital

→ Subbarao sir – ToC, CD, algo, Prog, DS, CN, D.M.

→ Uma sir – EM, X, DM

→ Few live, Recorded

C-DS, → malleshm

CoA, OS, DS