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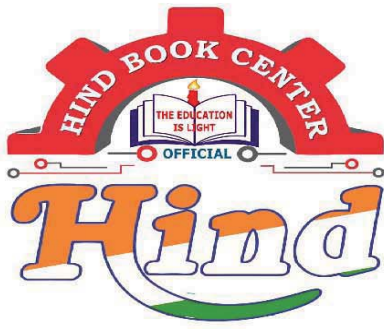
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By-Ravi Sir

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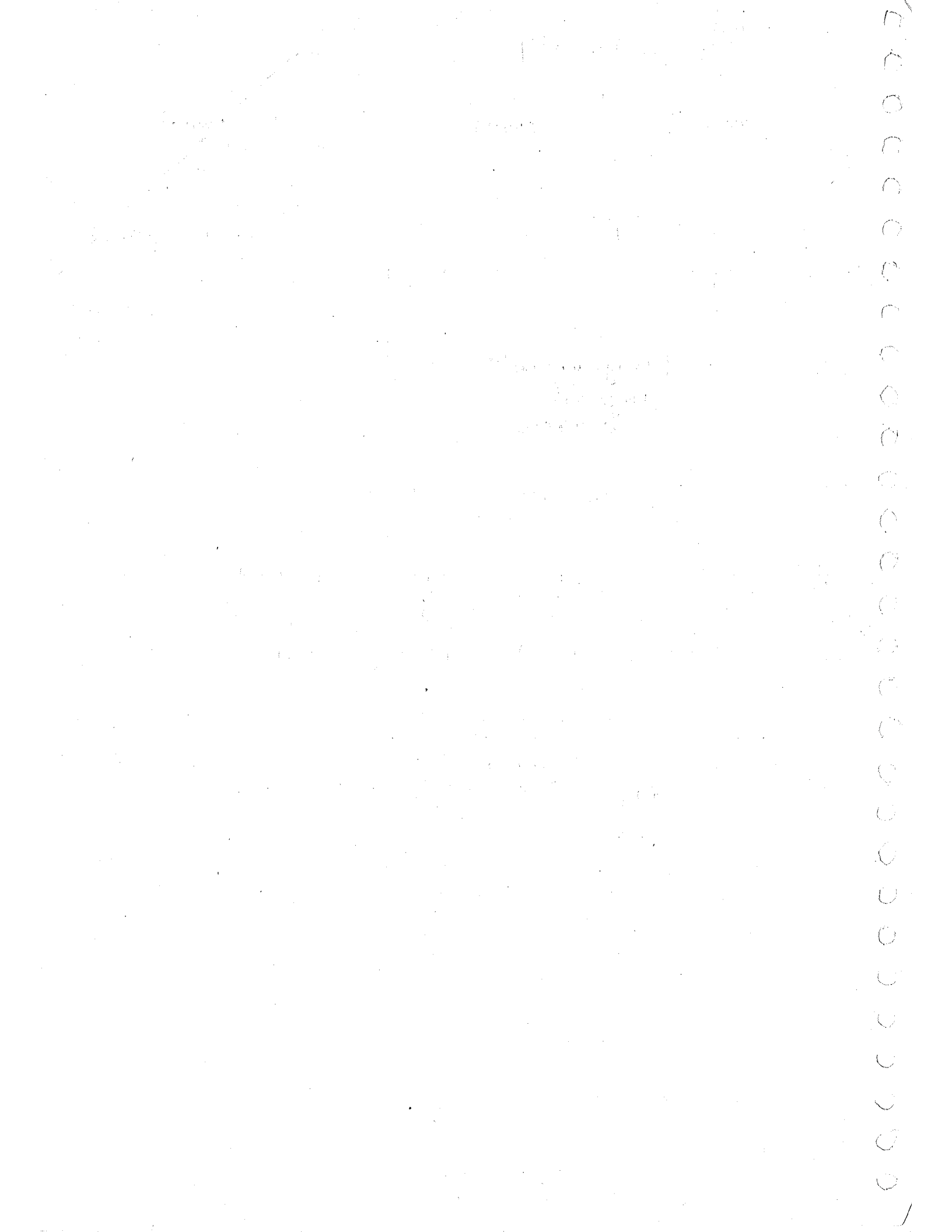
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→ Revision
 2-3 (days)
 → short notes

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DBMS

	More Practice	Less Practice
Normalization	<ul style="list-style-type: none"> ① Finding candidate key ② Lossless Join / DP ③ 1NF to BCNF def / theory ④ Higher NF? 	<ul style="list-style-type: none"> ① Canonical cover ② Decomposition into higher NF.
Queries	① RA / SQL	① TRC (basics)
File + indexing Organisation	<ul style="list-style-type: none"> ① B / B+ tree [Theory / Numerical] 	① Dense index / Sparse index.
Transaction and concurrency	① 2PC / VSC	<ul style="list-style-type: none"> ① ACID Re / CLR / SH lock TSO
ERD	① Min RDBMS table for ERD	

www DH and BA and Appli }

www Algo + C & DS }

90% DBMS → (8-10)
 TOC → (8-10)
 (Parser + SDT) ← CD → (8-5)
 Digital → (8-5)

20-30%
 6-7% DPA/NPA
 min etc
 DPA TH

CN CO OS }
 (10 marks) (8-10) (8-10)

① Top down Approach (Kawze)

① Problem

DBMS [8-10 Marks]

Syllabus → (1) Integrity Constraints and ER-model	2 Marks
(2) Normalization.	2 Marks
(3) Queries [Relational Algebra, SQL, Relation calculus]	4 Marks
(4) File Organisation and Indexing.	2-4 Marks
(5) Transactions and concurrency control.	2-4 Marks

→ Notes (Revise 2 times a day)

→ WB/GATE

→ Text book Ex Problems

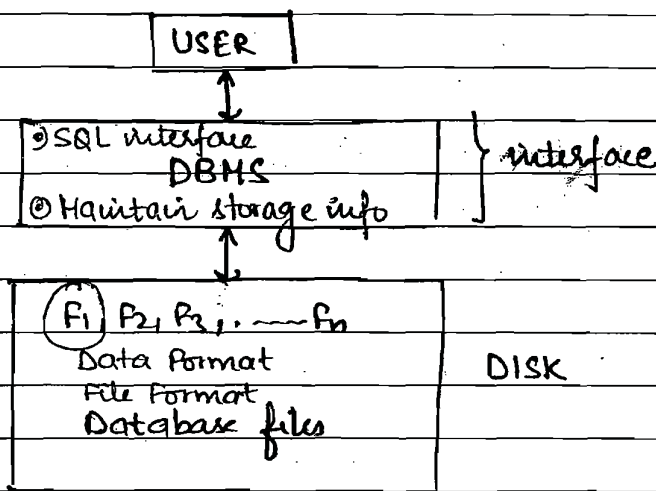
- ↳ 1) DBMS by Raghuramkrishnan
- 2) DBMS by Navathe

Introduction to DBMS

① Database → Collection of related data

Ex → Set of student's information

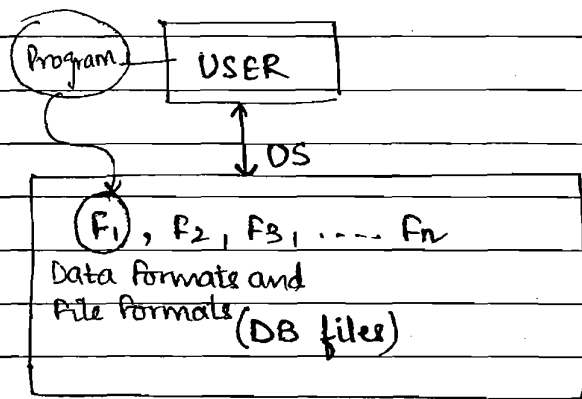
② Database Management System (DBMS) → Software used to manage and access database more efficient manner. In other words, acts as interface between user and database files



Users

Data Independency → User can access data from database files without knowing storage information of file system. In other words, hiding storage information to the external users, is called data independency.

Flat File System [OS files] → when the user manages database files managed by user without DBMS software.

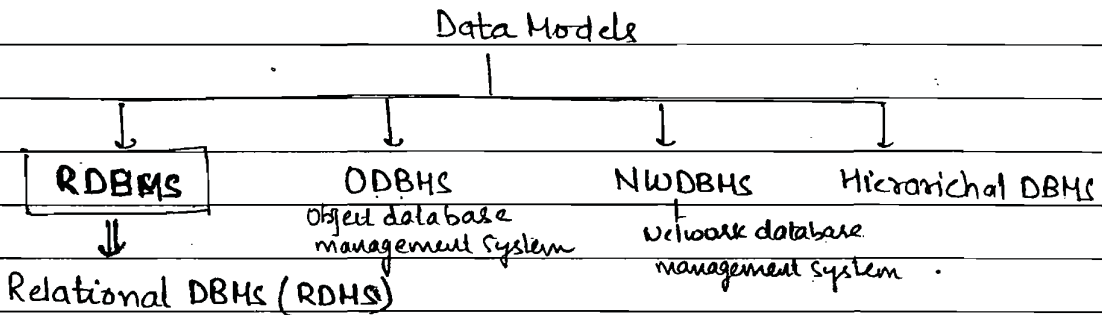


- ① Flat File System can be used to manage small database.
- ② Flat File System fails to manage, if size of database is too huge.

Limitations of Flat File System Vs Advantage of DBMS file System

Limitation of Flat File System	Advantage of DBMS file system
1) Too Complex to manage and develop application programs	1) Because of data independency, easy to develop application programs (simple SQL Query required to access the data).
2) More I/O cost to access data from database files	2) Because of indexing, less I/O cost required to access data from database files.
3) Less degree of concurrency.	3) More degree of concurrency.
4) Too complex to maintain, more ^{non-} redundant data.	4) By using normalization of database, can maintain non-redundant data.

Integrity Constraints



↳ Proposed by R.J. Codd [Codd's data Model]
↳ Codd proposed 12 Rules for RDMS software design (RDBMS Guidelines)

RDMS Guidelines

- ① Data in DB file must be in tabular format [i.e. set of Rows and Columns].
- ② No two Models of DB table should be same [Candidate key]

let candidate key

Stud	sid	Sname	DOB	Attribute / Field
Relational Instance	S1	A	2000	← each row is called Record / tuple
	S2	B	1995	
	S3	B	1998	
	S4	C	1995	

each column is called Attribute / Field

~~RDMS~~ . RDBMS file

(3 arity for above)

- ① Arity → NO. of attributes of database table. (i.e. sid, Sname, DOB - 3)
- ② Cardinality → No. of Records of database table. (above - 4)
- ③ Relational Instance (Snapshot) → A Record set of database table.
- ④ Relational Schema → Definition or structure of database table.

Ex → stud(sid, Sname, DOB) → Relational Schema.

Key for a Relation is defined according to the requirements of user. Key can be one, which can uniquely distinguish it from others.

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Candidate Key \rightarrow Minimal set of attributes used to differentiate records of a relational schema, uniquely.

minimal Attribute set	+ No two records with same attribute value (unique)	} Candidate Key

Ex \rightarrow ① Stud (Sid, Sname, DOB)

Sid: Candidate Key.

Sid Sname: Not Candidate Key

② Enroll (Sid Cid Fee)

S1 C1 -

S1 C2 -

S2 C1 -

S3 C2 -

Sid Cid: Candidate Key

Ex \rightarrow A student having student id can enroll in more than one course and a course can be enrolled by more than one student.

Primary key can be \rightarrow student id (here unique)

\rightarrow More than one candidate key is allowed
Not NULL

③

Emp

eid	ename	DOB	PanID	Aadhaar	IFSC	Acno
e1	A		X2		SB101	101
e2	B		NULL		SB101	102
e3	A		X5		IC101	101
e4	C		NULL		IC101	102

\rightarrow NULL: unknown / un existed value

\rightarrow Not Null constraint: Null values not allowed

Candidate key of Emp relation \rightarrow {eid, PanID, Aadhaar, ifsc Acno}

Primary key

keyword used {PRIMARY KEY}

Alternative Keys

{UNIQUE} - keyword used