

Index Classifications

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CS3200

Indexes

A data structure that allows the DBMS to locate particular records in a file more quickly and thereby speed response to user queries.

Types of Indexes:

- **Primary Index:** the data file is *sequentially ordered* by an ordering key field, and the indexing field is built on the ordering key field (unique).
- **Clustering Index:** the data file is sequentially ordered on a *non-key* field (not distinct), and the indexing field is built on this non-key field (**clustering attribute**).
- **Secondary Index:** an index that is defined on a *non-ordering* field of the data file (distinct or not).

A file can have at most 1 primary index or clustering index, and several secondary indexes.

Index Example

STAFF

SG14	John	White	18000	B005
SG37	Flo	Beech	12000	B003
SL21	Carson	Ford	30000	B003
SL41	Mary	Howel	9000	B007

Data File

Of any file organization

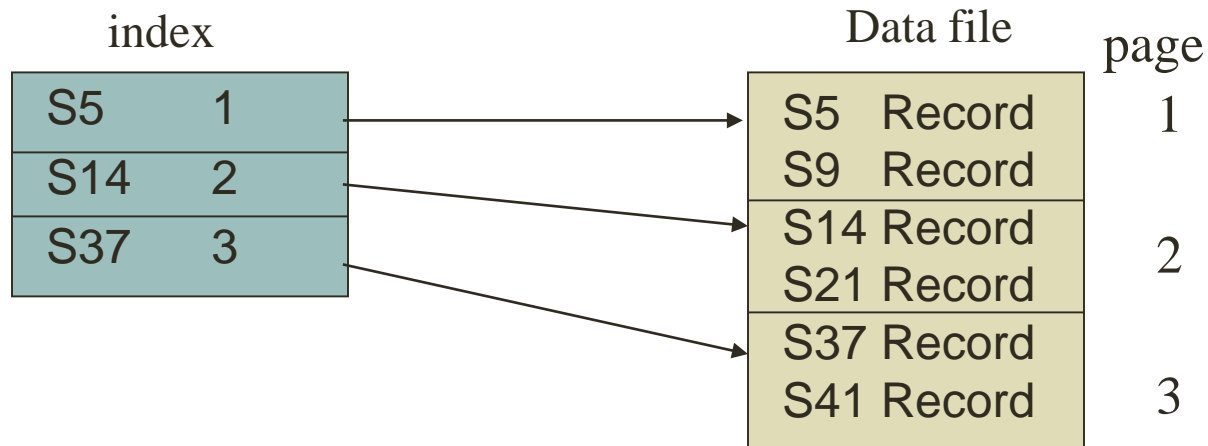
(brnNo)

B003
B003
B005
B007

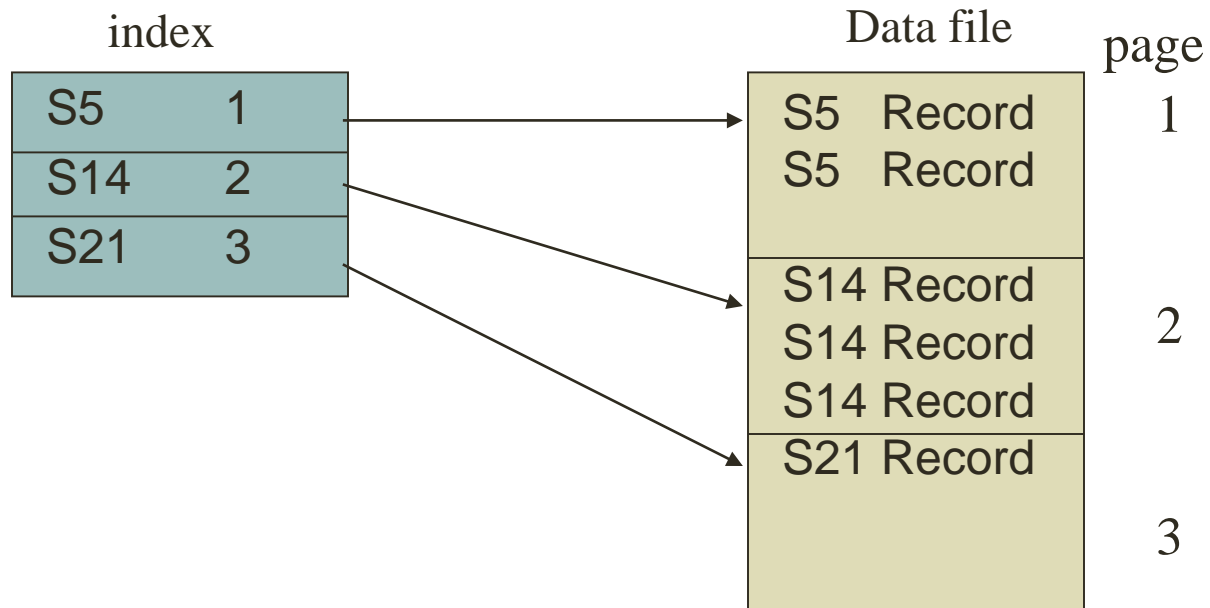
Index File

ordered

Primary Index Example



Cluster Index Example



Secondary Index Examples

STAFF

StaffNo	FName	LName	Salary	BrnNo
SG14	John	White	18000	B005
SG37	Flo	Beech	12000	B003
SL21	Carson	Ford	30000	B003
SL41	Mary	Howel	9000	B007
SL50	Ken	Howel	30000	B007

(salary, brnNo)

9000, B007
12000, B003
18000, B005
30000, B003
30000, B007

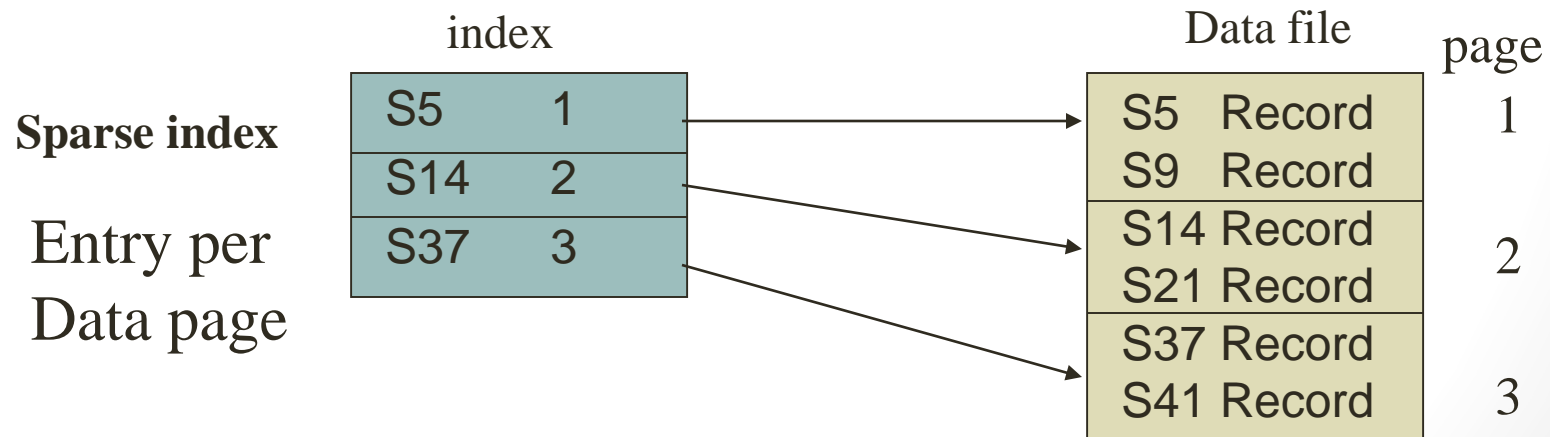
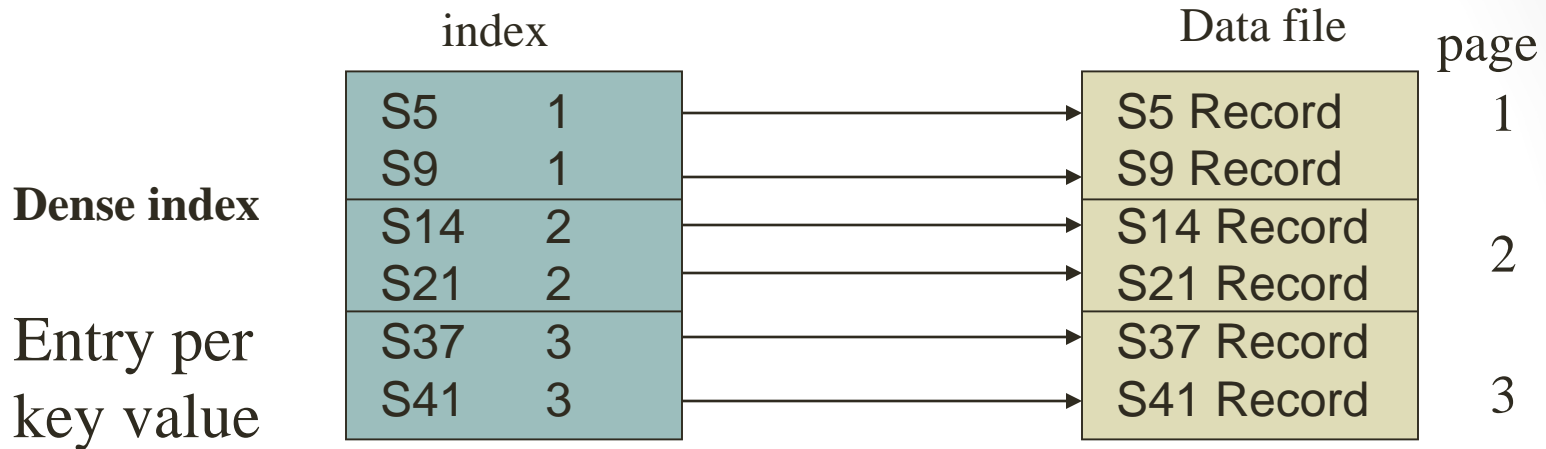
(salary)

9000
12000
18000
30000

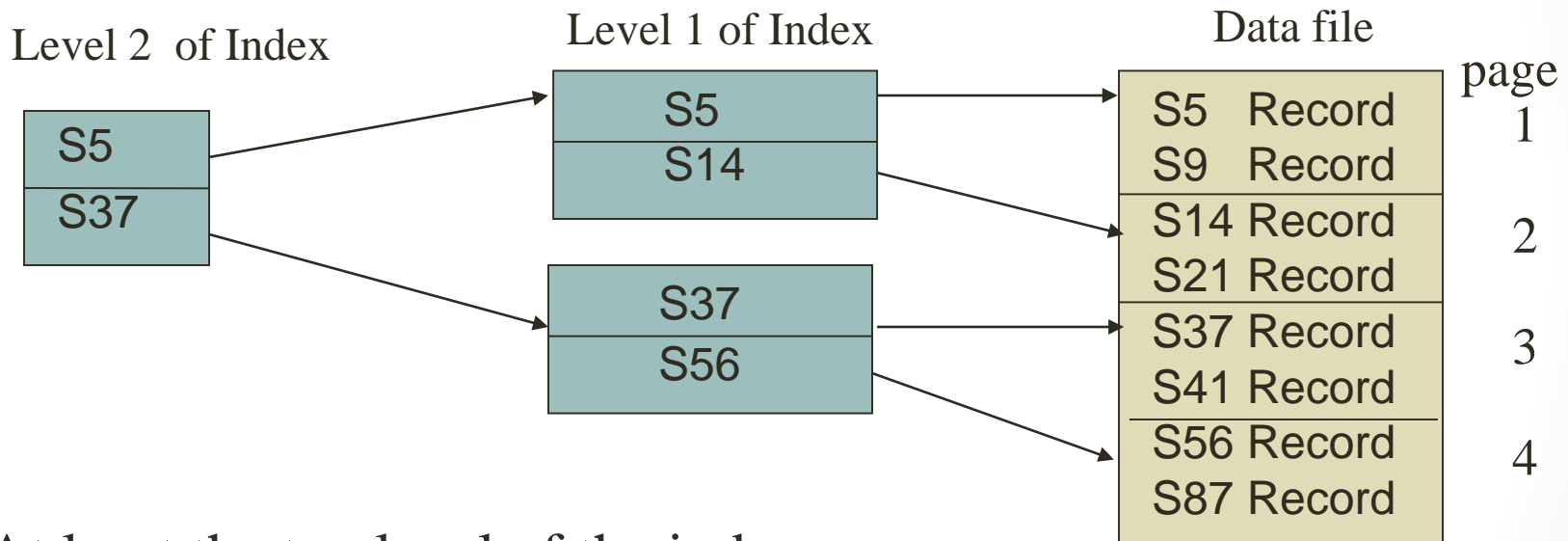
Sparse versus Dense index

- a **Dense index** has an index record for every search key value
- a **Sparse index** has an index record for only some of the search key values

Index Class Examples



Multilevel Index



At least the top level of the index should fit into memory