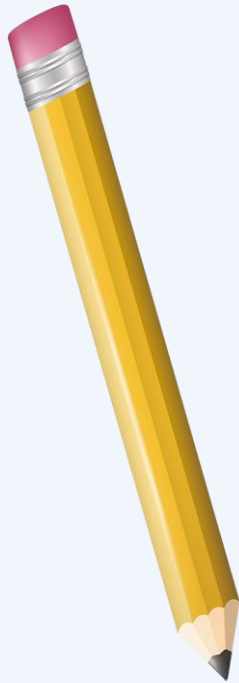




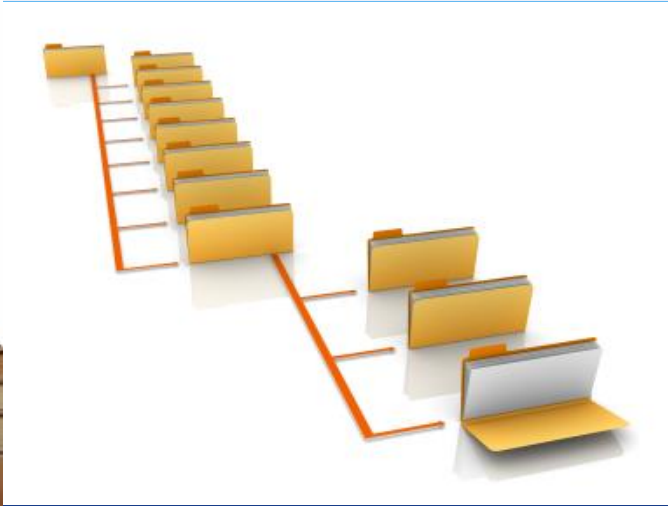
اللهم صل وسلم وبارك على سيدنا محمد وعلى
آله وصحبه وسلم تسليماً كثيراً طيباً مباركاً فيه

File Organization



Dr \ Mohammed Ahmed Mahfouz

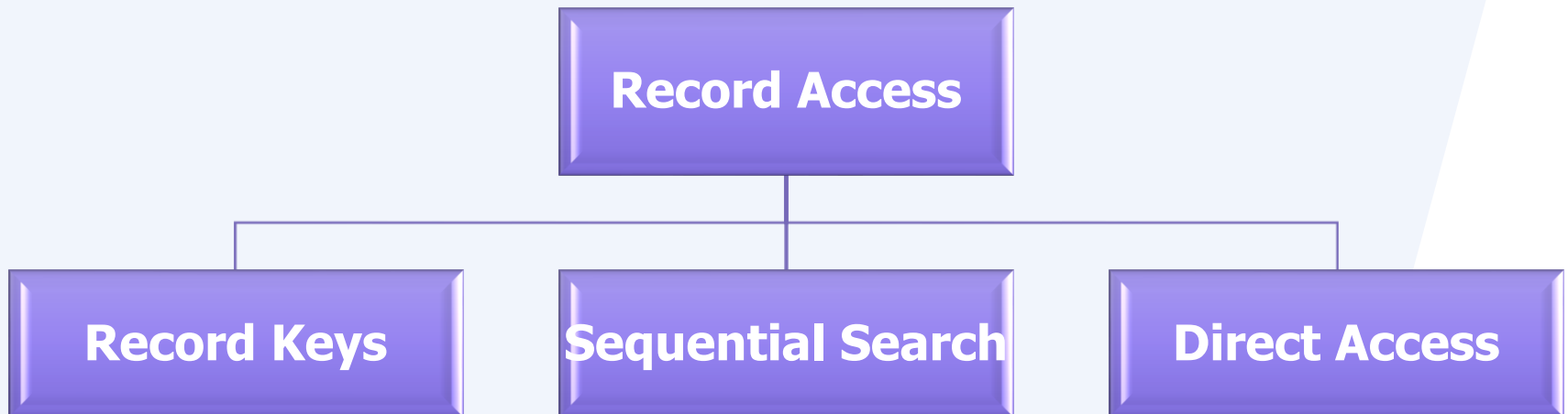
**Doctor of Information Systems
Thebes Higher Institute for
Management and Information
Technology**



Managing Files of Records

Lecture No. 4

Record Access



1- Record Keys

- ❖ **Key:** a subset of the fields in a record used to uniquely identify the record.
- ❖ **Primary Key:** A key that uniquely identifies a record.
- ❖ **Secondary Key:** Other keys that may be used for search
- ❖ In general not every field is a key
- ❖ Keys correspond to fields, or combination of fields, that may be used in a search

1- Record Keys

Primary Key	Secondary Key
must identify records uniquely	Does not identify records uniquely
It is not dataless	It is not dataless
Has a canonical form	Has a canonical form
Ex. Student ID	Ex. Student Name

2- Sequential Search

- ❖ Search for a record matching a given key
- ❖ Look at records sequentially until matching record is found.
- ❖ The work required to search sequentially for a record in a file with n records is proportional to n : It takes at most n comparisons; $n/2$ on average.
- ❖ Time is in $O(n)$ for n records.

2- Sequential Search

- ❖ To improve the performance of sequential search, use **record blocking**
- ❖ **Record Blocking:** by reading in a block of several records all at once and then processing that block of records in memory.

2- Sequential Search

❖ It is **appropriate** for :

- **ASCII files** in which you are searching for some pattern.
- Files with **few records** (ex. 10 records)
- Files that **hardly ever need to be searched** (ex. Tape files)
- Files in which you want all records with a certain secondary key value, where a **large number of matches** is expected.

3- Direct Access

- ❖ Being able to seek directly to the beginning of the record.
- ❖ Time is in $O(1)$ for n records.
- ❖ Possible when we know the **Relative Record Number (RRN)**
- ❖ **First** record has **RRN 0**, the next has RRN 1, etc.

3- Direct Access

Data File

1202345|Ahmed|Hassan|1 Safa street|Cairo|Egypt|2349890|Mona|
Hussein|42 El Thawra street|Ismailia|Egypt|1210322|Tamer|Fouad|
123 Ramsis street|Cairo|Egypt|

Index File

00	47	103	153
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3- Direct Access

- ❖ Requires records of **fixed length**.
 - RRN=30 (31st record)
 - Record length = 101 bytes
 - Byte offset = $30 \times 101 = 3030$
- ❖ Now, how to go directly to the byte 3030 in the file
 - By seeking

Header Record

- ❖ A record placed at the **beginning** of a file that is used to **store information about the file contents** and the **file organization**.
- ❖ **Ex:** the length of data records, the date and time of the file's most recent update, the name of the file, and so on.
- ❖ The header record usually has a **different structure & different size** than the data records in the file.



Thank You !