## Chapter 3.1 The basics of Index Structure

***Definition:***

*Storage Structure:*

The Storage Structure is constructed by files, here the concept of file similar with the concept in Operation System.

*Example:*

One data file can be used to store one Relation. One data file can own one or multi - index files, each index file build the connection between the Query Key and Data Record. The pointer of the Query Key points to the record with the same property.

*Dense Index:*

The index could be Dense, which is to say that each record in data file will set it’s corresponding index in the index file.

*Sparse Index:*

The index could be Sparse, which is to say that some of the records in the index file will be present in the index file, normally each data block will be set one index in the index file.

*Main Index:*

The Main Index could be used to identify the location of the records in the data file.

*Auxiliary Index:*

The Auxiliary Index could not be used to identify the location of the records in the data file.

*(Normally, we will create the main index on the main key among Relation, and construct the Auxiliary Index on other attributes.)*

*Inverted Index:*

Given one or several key words, then through using Inverted Index, then we can get information from texts more efficiently.

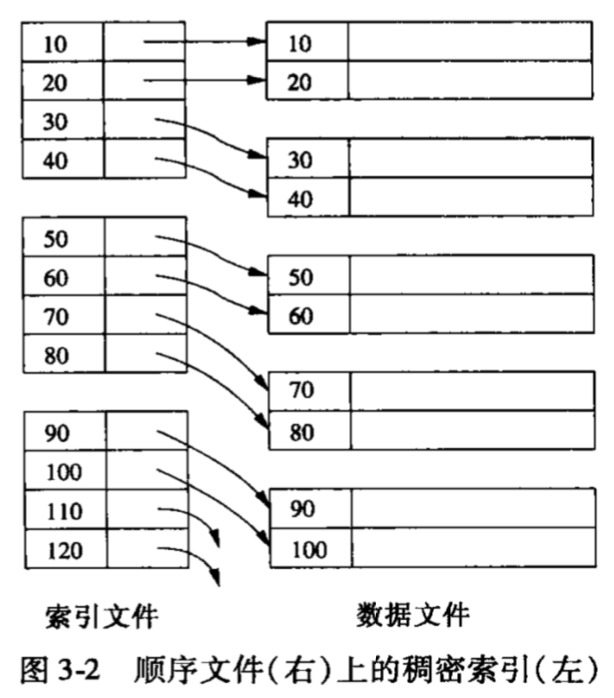
### Chapter 3.1.1 Sequential File

***Definition:***

Sequential File is the file that sorted all tuples of Relation according to the Main Key. The tuples are distributed among multi - blocks.

***Example:***

* In the image below, the sequential file has been displayed. Here assume that the Main Key is integer and there only exist two records in each storage block.
* The first block of the file just stored two records whose key value are 10 and 20. Also we use the continuous multiple as the Main Key.



### Chapter 3.1.2 Dense Index

### Chapter 3.1.3 Sparse Index

### Chapter 3.1.4 Multi - Level Index

### Chapter 3.1.5 Auxiliary Index

### Chapter 3.1.6 The Usage of Auxiliary Index

### Chapter 3.1.7 The Auxiliary Index’ Indirect

### Chapter 3.1.8 File Search and Inverted Index