## Chapter 3.7 Bitmap Index

***Principle:***

Assuming that the file records have a permanent identification: 1, 2, 3..., n. There exists some data structure, for random i, enables us to find the ith record easily.

***Definition:***

The bitmap for field F is a byte vector collection with length n. Each byte corresponds to a possible value that may exists or not.

1. If the ith record of field F equals to v, then in byte vector collection, it assigns to 1 when the field F of records equals to v.
2. If the ith record of field F doesn’t equal to v, then in the byte vector collection, it assigns to 0 when the field F of records doesn’t equal to v.

***Example:***

Assuming that the record in file consist of two fields F and G, and the field F is integer and the field G is string. Now, there exist six records in the file, the values are (30, foo), (30, bar), (40, baz), (50, foo), (40, bar), (30, baz).

* Field F

|  |  |
| --- | --- |
| Possible Values of Field F | Each Byte indicates Whether ith Record equals to Current Possible Value of Field F |
| 30 | 110001 |
| 40 | 001010 |
| 50 | 000100 |

* Field G

|  |  |
| --- | --- |
| Possible Values of Field G | Each Byte indicates Whether ith Record equals to Current Possible Value of Field G |
| foo | 100100 |
| bar | 010010 |
| baz | 001001 |

### Chapter 3.7.1 Motivation of Bitmap Index

Example:

### Chapter 3.7.2 Compressed Bitmap

### Chapter 3.7.3 Operations On Fractional Length Encoding Bit Vector

### Chapter 3.7.4 Management of Bitmap Index