

DB2 – Exercise Idx



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1. What is the main difference between a B and a B+ Tree?
2. Can you make an example where the access depth in a B* of two values is different (Different High)?
3. Define the Criteria of a minimum/ maximum filled B+Tree
4. Given a B-tree of class $T(8,13)$, what are its maximal and minimal number of keys? Justify your answer.
5. Describe how a key set can be inserted into a B-tree of class $T(k, h)$ such that the number of nodes becomes maximal.
6. How should the B-tree look like to make writing operations faster?
7. How can you speed up the construction of a B-tree for a given, large set of keys?
8. What are the advantages/ disadvantages of B-Trees? (Maintenance, dynamic, static, fill factor, usage...)

see: Theo Härder Grundlagen der Informatik II p. 175++ [The RED Book]

1. Calculate the size of the Bitmap Index: The Index is on the column „colour“ of the table „subpixel“. The pixel is constructed out of 3 possible subpixel {(red, green, blue)=Domain of 3}. The table indexes a Full HD Display.
2. How to maintain a bitmap Index? (Expansion of Domain, No Expansion of Domain)
3. How to scan a Bitmap Indexed Table?
4. Which Operations can be performed on Bitmap Idx?
5. What are the (dis-)advantages of Bitmap Idx over traditional idx (B-Trees) and what are the limitations of Bitmap Idx?
6. What is an Encoded Bitmap Index? What problem(s) does it solve?

Z – Order

Given is a 4 Bit Encoded 2D Space which is identified by pairs (x,y)

1. Create a Z Transformation on the given Space
2. How do you determine the address of A, B, C via the Z-Order?
3. What are the advantages of the Z-Order?

| | | | | |
|----|-------------------|-------------------|-------------------|------|
| 11 | 1111 | 1110 ^C | 1011 | 1010 |
| 10 | 1101 | 1100 | 1001 ^A | 1000 |
| 01 | 0111 ^B | 0110 | 0011 | 0010 |
| 00 | 0101 | 0100 | 0001 | 0000 |
| | 11 | 10 | 01 | 00 |