

CSE 373: Section 5

Memory and B-Trees

October 25th

B-Trees

1. Insert the following into an empty B-Tree with $M = 3$ and $L = 3$: 12, 24, 36, 17, 18, 5, 22, 20.

2. Given the following parameters for a B-Tree with $M = 11$ and $L = 8$

- Key Size = 10 bytes
- Pointer Size = 2 bytes
- Data Size = 16 bytes per record (includes the key)

Assuming that M and L were chosen appropriately, what is the likely page size on the machine where this implementation will be deployed? Give a numeric answer and a short justification based on two equations using the parameter values above. **Hint:** The three equations you will need to use are:

$$M = \lfloor \frac{p+k}{t+k} \rfloor, L = \lfloor \frac{p-t}{k+v} \rfloor, p \geq Mt + (M-1)k$$

Where p is the page size in bytes, k is key size in bytes, t is pointer size in bytes, and v is value size in bytes. Think about where these values come from

Memory

1. What are the two types of memory locality?
2. Does this more benefit arrays or linked lists?
3. What about Java makes it a poor choice for implementing B-trees?
4. Provide and justify the bigO memory analysis for AVL insertion?
Remember, what needs to be kept track of