

# CSE 332: Data Structures and Parallelism

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## Section 4: Balanced Trees

### 0. B-Trees

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

(b) 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:

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

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. This will **not** be on the exam, so you will need to memorize it!