

# CMPT 280

## Topic 17: B+ Trees and B Trees

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# References

- Textbook, Chapter 17

## Exercise 1

- B+ trees: generalization of 2-3 trees.
- Insertion and deletion algorithms are the same, except more children are allowed.
- B+ tree of order  $b$  – nodes have between  $\lceil b/2 \rceil$  and  $b$  (root may have between 2 and  $b$ ).
- 2-3 Tree is a B+ tree of order 3.
- Build a B+ tree of order 5 using the keys:  
20, 2, 7, 4, 14, 8, 12, 9, 17, 1, 18, 15, 3, 19,  
11, 10, 13, 6, 16

## Exercise 2

- B-trees: generalizations of ordered binary trees.
- Both internal and leaf nodes contain keyed data items.
- Insertion/deletion algorithms similar to B+ trees - split, give/steal.
- Node in B-trees of order  $b$  have nodes have between  $\lceil b/2 \rceil$  and  $b$  (root may have between 2 and  $b$ ).
- Repeat exercise 1, but build a B-tree of order 6.

## Next Class

- Next class reading: Chapter 18:  $k$ -D trees.