

**CPSC 332 File Structures and Database Systems**  
**Homework #5 (due May 1 before 11:59pm)**  
Instructor: Dr. Shawn Wang

**Please write the last 4 digits of your campus wide ID on the front page of your homework.**

1. Suppose you have these inputs: M, I, T, Q, L, H, R, E, K, P, C, A.
  - a. Show the binary search tree for these inputs.
  - b. Show how to store the binary search tree in an array with the node structure (key, left, right).
2. Show the B+-tree of order three (namely each node has a maximum of three keys/descendents) that result from loading the following sets of keys in order:
  - a. M, I, T
  - b. M, I, T, Q, L, H, R, E, K
  - c. M, I, T, Q, L, H, R, E, K, P
  - d. M, I, T, Q, L, H, R, E, K, P, C, A
3. Show the trees that result after each of the keys N, T, H, and Y is deleted individually and separately from the following B+-tree. Do not delete the keys based on the results you got. Each key should be deleted from the original tree.

