

# **Tutorial 8: Indexing Techniques**

## **CS3402 Database Systems**

# Question 1

- Construct a B<sup>+</sup>-tree for the following set of key values:

(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)

Assuming that the tree is initially empty, values are added in ascending order, and the number of key values in internal nodes and leaf nodes are both 3 (i.e., the maximum number of tree pointers in an internal node is 4 = max. degree).

# Question 2

- For the B<sup>+</sup>-tree constructed for Question 1, show the form of the tree after each of the following series of operations:
  - Insert 9
  - Insert 10
  - Insert 8
  - Delete 7
  - Delete 8
  - Delete 5
  - Delete 3
  - Delete 11