4D2 Tutorial #4

B-Trees

Question 1

Draw by inspection a completely filled B-tree with \( m=5 \) which consists of the letters A-I, K-Y inclusive.

a. Insert Z into the tree.
b. Show the tree at each stage when deleting U from it

Show each stage of the tree.

Question 2

Build using the algorithm given in the lecture a B-tree with \( m=5 \) on all primes between 1 and 59 given in ascending order, i.e. 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59

a. What is the average number of node splits per new key inserted?
b. What is the average search time?
c. What is the average search time for an optimal binary lexicographic tree on the same keyset?