COS212 (Data Structures and Algorithms)

Tutorial Exercise 7
2021/05/25

Question 1 Bit Trees ..... (2 marks)

The following bit-tree leaf is given:

n/a	2	3	1	2	0	3
ptr0	ptr1	ptr2	ptr3	ptr4	ptr5	ptr6

First row stores D-bits; second row stores the corresponding file pointers. Which pointer will be used to check if

a) [1 point] ...value 7 (0111) is stored in the leaf?

b) [1 point] ...value 10 (1010) is stored in the leaf?

Question 2 Tries ..... (3 marks)

The following set of strings must be stored in a trie: `CAN, CANT, CAT, SUPER, SUPERGENE, SUPERMAN, SUPERSTAR, ROCKSTAR, TRACE, TRAVEL`

2.1 [1 point] What is the height of the resulting trie?

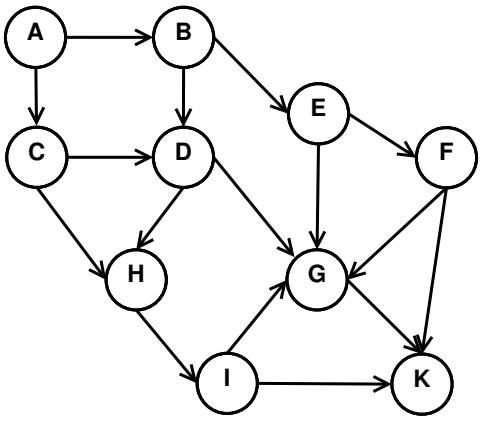
2.2 [1 point] What is the height of the trie if the trie is constructed *a tergo*?

2.3 [1 point] If the trie nodes use arrays of a fixed size, what array size should be used for the given set of strings?

Question 3 Graphs ..... (3 marks)

3.1 [1 point] How many edges will a complete graph G have for $|V| = 36$?

3.2 Consider the following graph:



Wherever there is a choice among vertices in a graph to be processed next, you must process them **alphabetically**.

a) [2 points] Give the order in which vertices will be visited if depth-first-search traversal was applied to the graph.