

Name:

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Section:

In the game of thrones, there was an event called “Red Wedding”. In this event, the Stark Army led by Robb came to celebrate a wedding. Unfortunately, this wedding was a facade for an assassination by the Lannisters. The Starks sat in a manner that resembled the structure of a Binary Tree. Robb sat at the root of the tree while others sat at the other child nodes.

When the festivities were supposed to begin, Lannister’s henchman, Walder Frey, initiated the assassination. But they followed a peculiar pattern. Considering that Robb was at level 0 ($k = 0$), they started the assassination with a certain level, k . For example, if $k = 2$ is given, they will attack only the people at level 2. You have to figure out who the people are at the given level.

They followed a specific sequence while attacking the people of that given level. Sequence maintained a hash function. Hash value was calculated taking the sum of ASCII value of each character of their name and then the sum

multiplied by the length of the name. Ultimately, you have to mod the calculated value by a certain number (Hint: Where will you insert the value?)

For example:

In case of Robb,

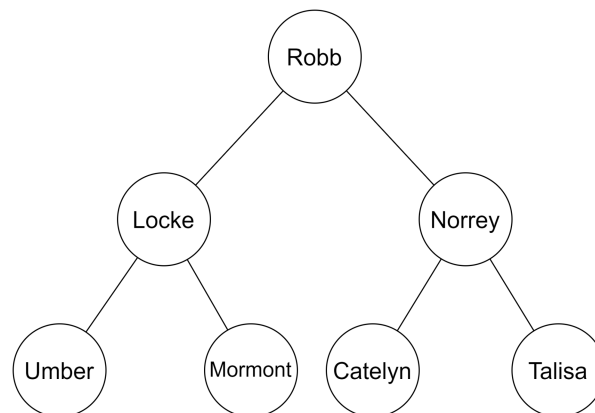
Hash value = $(82 + 111 + 98 + 98) * 4 \% \underline{\hspace{2cm}}$

If two people have the same hash value, you have to place that second person in the next available space.

Using the hash function, you have to generate the sequence they were attacked on.

Example 1:

Input Tree:



$k = 2$

Output:

Nodes at distance 2 from root: ['Umber', 'Mormont', 'Catelyn', 'Talisa']

Hash table: ['Mormont', 'Catelyn', 'Talisa', 'Umber']

ipynb file: [CSE220-35 Lab Final.ipynb](#)

Marks distribution: $2+2+2 = 6$