Lab 6-6-2023

1. Generate a Merkle tree of the given text using an online hash calculator:

    a. Copy the text in four parts as given below.

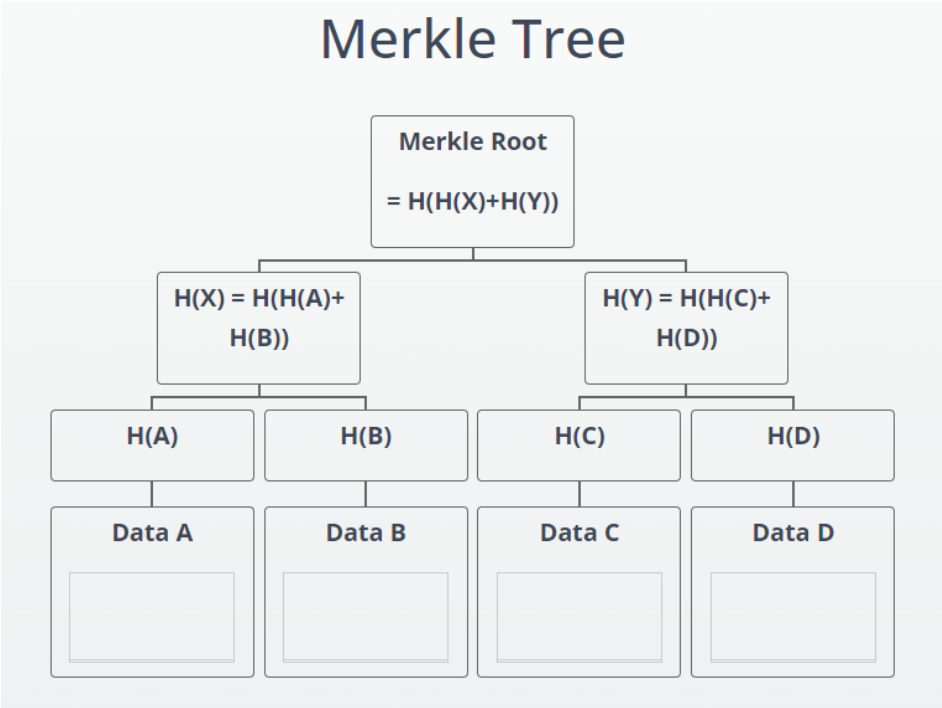
Part 1:
And now the end is here
And so I face that final curtain
My friend I'll make it clear
I'll state my case, of which I'm certain
I've lived a life that's full
I traveled each and every highway
And more, much more
I did it, I did it my way

Part 2:
Regrets, I've had a few
But then again too few to mention
I did what I had to do
I saw it through without exemption
I planned each charted course
Each careful step along the byway
And more, much, much more
I did it, I did it my way

Part 3:
Yes, there were times I'm sure you knew
When I bit off more than I could chew
But through it all, when there was doubt
I ate it up and spit it out
I faced it all and I stood tall and did it my way

Part 4:
For what is a man, what has he got?
If not himself then he has naught
Not to say the things that he truly feels
And not the words of someone who kneels
Let the record shows I took all the blows and did it my way

b. Use this image to visualize the node and root hashes and then answer the questions at this link: https://forms.gle/wRJJzAmYqi43zzMm8



2. Write a program which does the following

a. Takes eight random strings of your choice
b. Calculates their block and nodal hashes to construct a Merkle tree
c. Prints out the Merkle root of the tree

3. Write a program which does the following
a. Imports a file (use a file of the lecture slides from LMS for this)
b. Parses the file into eight blocks
For the purpose of parsing you can use the following line of code

```
# Determining and spliting the file as per block size
blockSize = len(content) // 8
dataBlocks = [content[i:i+blockSize] for i in range(0, len(content), blockSize)]
```

c. Calculates the SHA-256 hashes of each data block
d. Concatenates these hashes to generate a Merkle tree
e. Prints out the Merkle root of the tree