Sequence Bloom Trees

Given the bit vectors (1010), (0010), (0001), and (0101), draw a sequence bloom tree that stores all vectors as leaves. Consider how the arrangement of leaves can affect the usefulness of the tree!

Count Min Sketch

What are the two components of a count min sketch?

1.

2.

Count Min Sketch Insertion

Given the following hashes and dataset, fill in the count min sketch.

\[ h_1(k) = k \mod 7 \quad h_2(k) = k + 3(k \mod 2) \mod 7 \quad h_3(k) = |k - 4| \mod 7 \]

S = \{1, 3, 8, 16\}

Find

Given the following hashes and dataset, identify the counts of the following values.

\[ h_1(k) = k \mod 7 \quad h_2(k) = k + 3(k \mod 2) \mod 7 \quad h_3(k) = |k - 4| \mod 7 \]

find(16):

find(1):

find(0):
**Count Min Sketch: Deletion**

Given the three hash values for the following items, which of them can be safely deleted?

- $H(x) = \{2, 3, 1\}$
- $H(y) = \{1, 1, 1\}$
- $H(z) = \{0, 1, 2\}$

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**Counting Bloom Filter**

Given the following sketch, what is the equivalent counting bloom filter?

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**Minimal Increase**

What is minimal increase?

Given the three hash values for the following items, how would the sketch be adjusted?

- $H(x) = \{2, 5, 1\}$
- $H(y) = \{4, 1, 5\}$