Data Structure & Algorithms
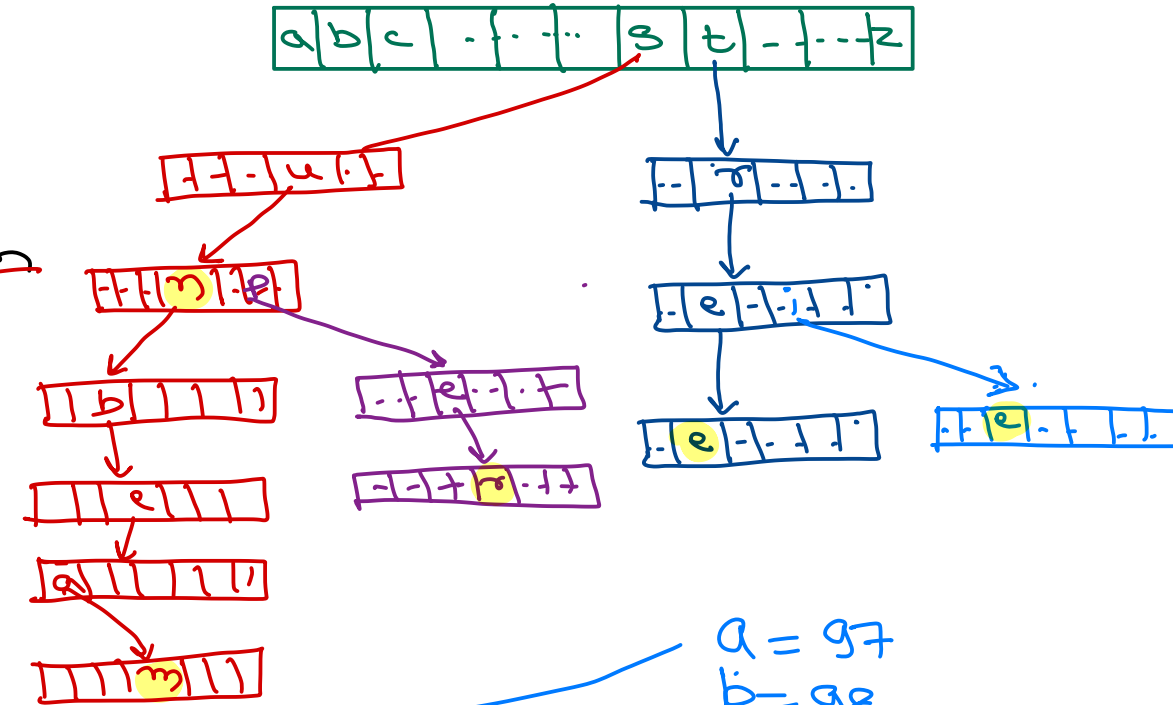
Sunbeam Infotech

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Trie

* Trie is multi-way tree.
* Each node have multiple child.
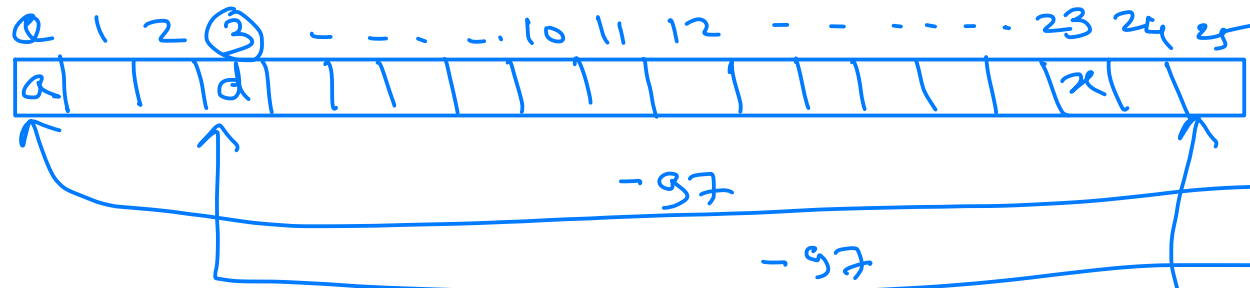* To store strings so that searching is faster.
    * alternative: Hash Table – O(1)
      worst case – O(n)
* Trie: time complexity → O(len)
  len = string length.

① tree
② trie
③ sun
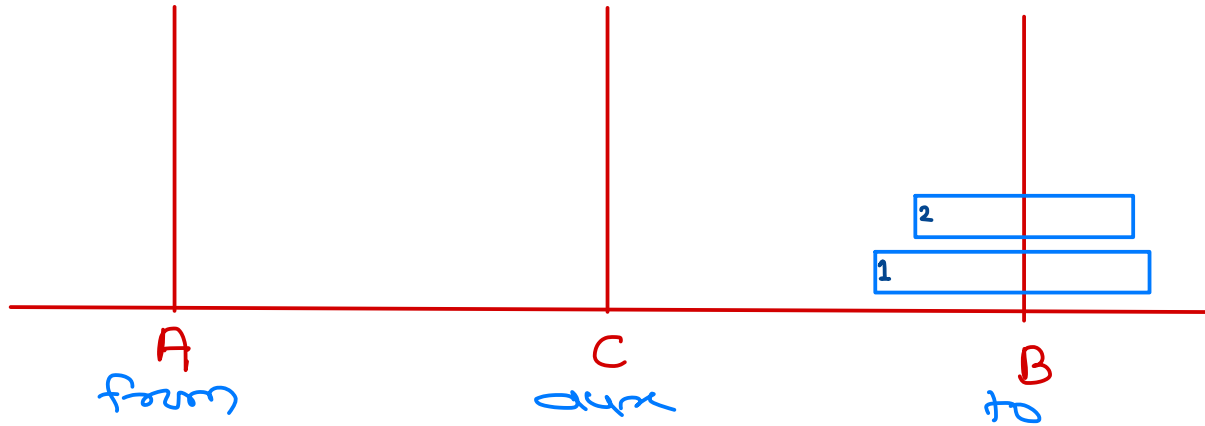④ sunbeam
⑤ super


```
a b c | . | . | . | .. | 8 | t | - | . | .. z
```

a = 97
b = 98
c = 99
d = 100
.
.
z = 122

① dictionary of words
② auto-completion / intellisense
③ faster search – string key.

Tower of Hanoi

num of disks = 1
1. A → B

num of disks = 2
1. ② A → C
2. ① A → B
3. ② C → B

from → aux
from → to
aux → to

① transfer all disks from A to B.
② you can use aux rod C.
③ can transfer only one disk at a time.
④ only smaller disk can be kept on larger disk.

Tower of Hanoi

Disks 1, 2, 3 stacked on peg B; pegs labeled A, C, B.
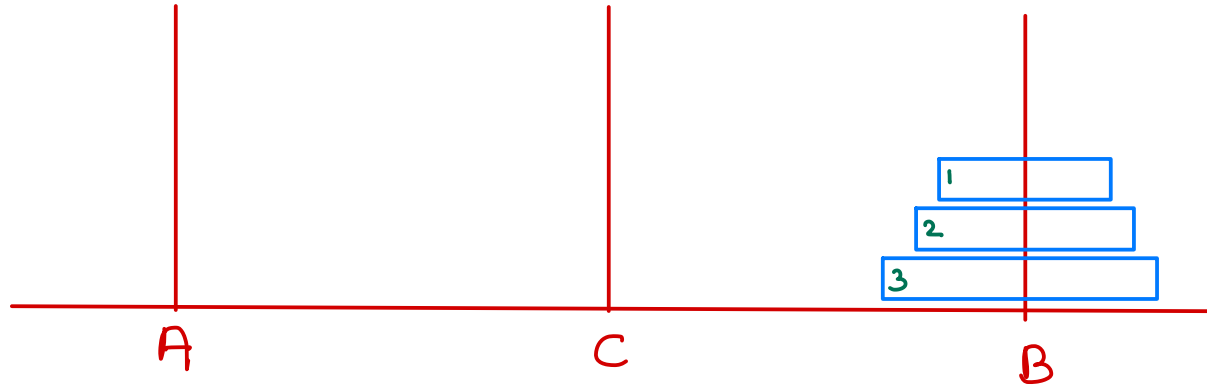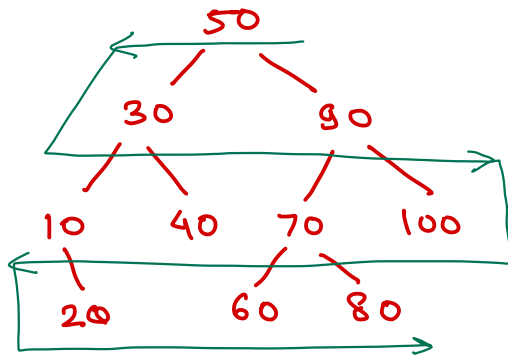
① transfer two disks from A to C using B.

② transfer a disk from A to B

③ transfer two disks from C to B using A.

3

```
wid toh (d, f, m, g) {
    if (d == 1)
        prints → move d f to t
            return;
    toh (d-1, f, g, t);
    print → move d f to t
    toh (d-1, g, t, f);
```

t

Binary tree diagram with root 50, left child 30, right child 90. Node 30 has children 10 and 40. Node 90 has children 70 and 100. Node 70 has children 60 and 80. Node 10 has child 20. Level-order traversal arrows shown.

50	30	90	10	40	70	100	20	60	80

Thank you!

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