Example

ARN CNS CPT BWI MEX ADD PVG LOS BNE EZE

Keep going! Add your dream itinerary.

KOA HND CCV......
Splay Tree/trie

1) do BST insert
2) splay new node to root
   (for other ops, splay deepest node you looked at)

worst case \( O(n) \)

amortized \( O(\log n) \)

any sequence of \( n \) operations has \( O(n \log n) \)

Frequently used keys will generally be close to root

\( \text{trie} \) - one child per possible next letter

node nodes where words end

\( \text{ball} \)
\( \text{bell} \)

\( k \) = length of word
Graph: represents things and relationships between them

nodes: people
edges: relationship

path: sequence of vertices w/ edges between JG KG KK MS JG TS CC

simple path: no repeated vertices JG KG KK MS

cycle: start/end at same place JG KG KK MS JG KG KK MS JG

simple cycle: no repeats except beginning/end
int foo(int n, int c)
{
    if (n == c)
    {
        return 0;
    }
    int i = 1;
    while (i < n)
    {
        if (i % c == 3)
        {
            if (n % 2 == 1)
            {
                return 0;
            }
        }
        i++;
    }
}

is there a path
entry -> exit
that doesn't hit a return

yes
vertices: cities
edges: roads
weights: travel time or distance

given two locations, find path start -> end
yield lowest total weight
vertices: intersections
edges: segment of roads
weights: travel times (min)