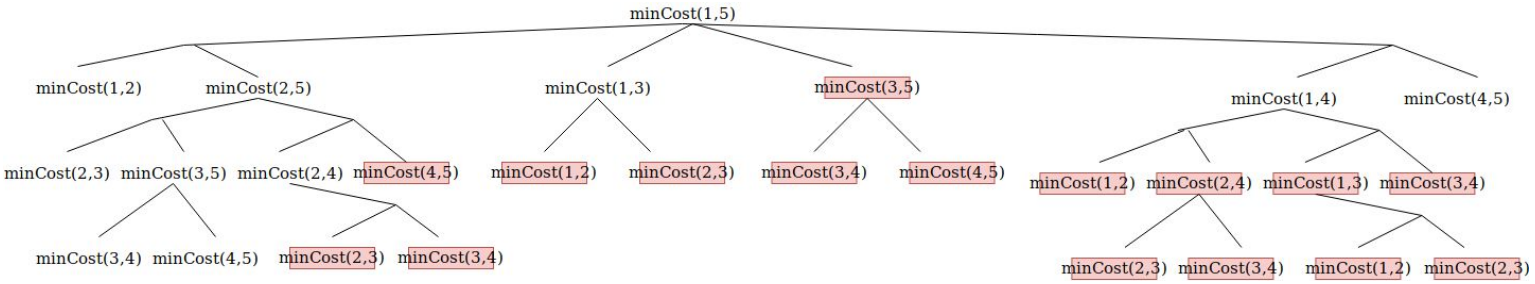
Premathilaka M.P.U
E/15/280

CO322 Lab02:

2. What is the runtime complexity of your implementation.

$O(2^N)$

3. Argue that dynamic programming can be used to improve the runtime.



The minCost() functions has recalled for the same source and the destination at multiple levels of the recursive tree. Therefore, in this recursion approach there is the overlapping between sub problems(shown in red color) and it would increase when the difference between start station and the end station increases. Thus, it is recommended to use dynamic programming to improve run-time of the programme.

5. Calculate the runtime of your implementation in part 4 above. Assume, hashing is O(1).

Now the runtime is less than the previous since all the overlapping subproblems are eliminated.Therefore, the total runtime depends on the for loop and the recursion calls which are left. Therefore time complexity is O(N^2)