DAA LAB-5

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1.)Aim: To implement the nth element of the fibonacci series using brute force approach , top bottom and bottom top approach using dynamic programming and to find the longest common subsequence using dynamic programming.

2.)Theory:

b.)Brute force approach: Brute Force Algorithms are exactly what they sound like – straightforward methods of solving a problem that rely on sheer computing power and trying every possibility rather than advanced techniques to improve efficiency.

a.)Dynamic programming: Dynamic Programming (DP) is an algorithmic technique for solving an optimization problem by breaking it down into simpler subproblems and utilizing the fact that the optimal solution to the overall problem depends upon the optimal solution to its subproblems.

c.)Top bottom approach: The idea here is similar to the recursive approach, but the difference is that we'll save the solutions to subproblems we encounter.This way, if we run into the same subproblem more than once, we can use our saved solution instead of having to recalculate it. This allows us to compute each subproblem exactly one time.This dynamic programming technique is called memoization.

d.)Bottom top approach: In the bottom-up dynamic programming approach, we'll reorganize the order in which we solve the subproblems**.** We'll compute f(1), then f(2) and so on.

e.)Longest common subsequence: If a set of sequences are given, the longest common subsequence problem is to find a common subsequence of all the sequences that is of maximal length.

3.)Observations:

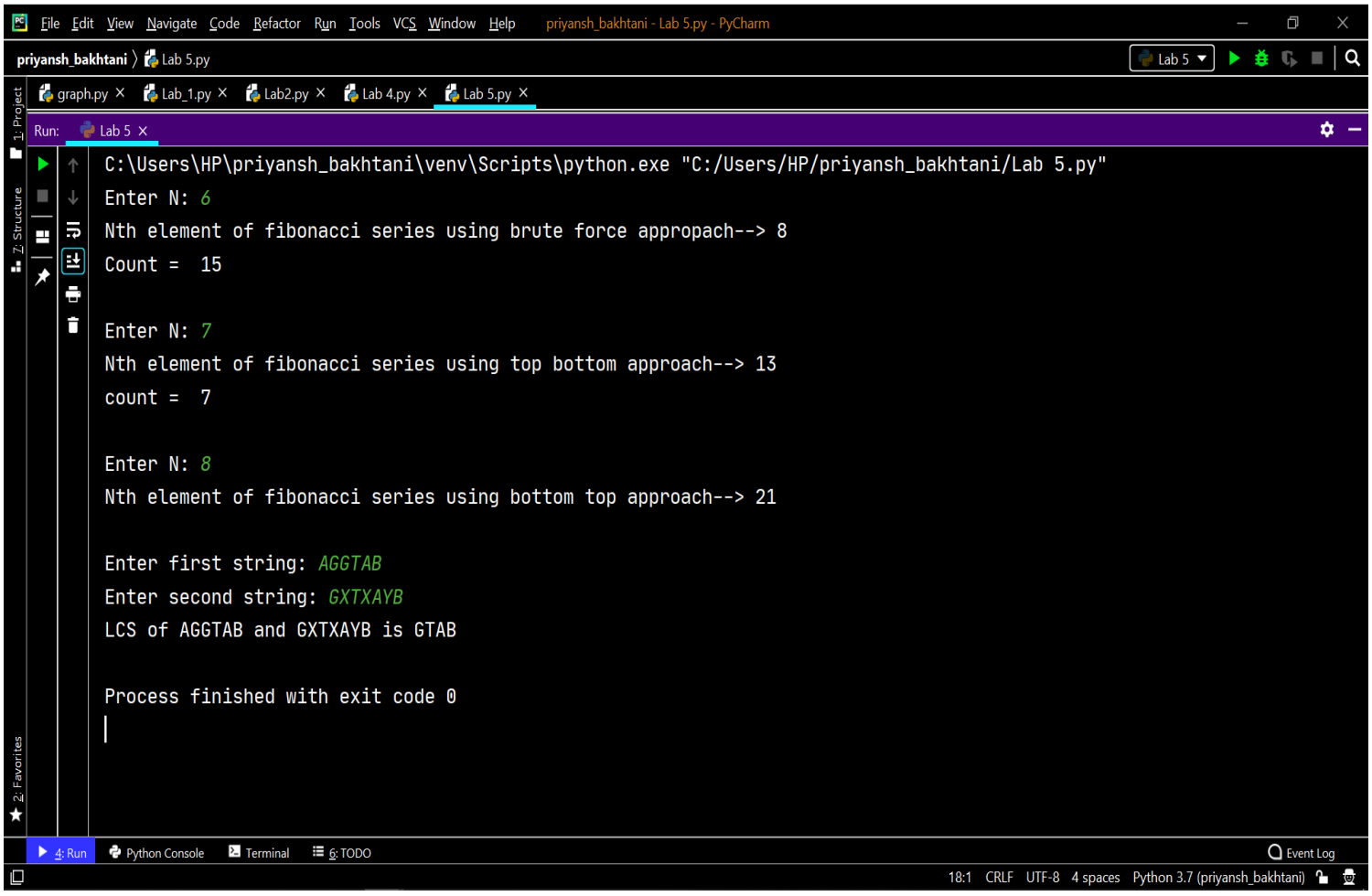
a.)In brute force approach for N=6 the nth element of fibonacci series was calculated to be 8 and the the function was called for 15 times.

b.)In top bottom approach for N=7 for Fibonacci series was calculated to be 13 and the function was called 7 times for values (7,6,5,4,3,2,1).

c.)In bottom top approach for N=8 the Fibonacci series was calculated to be 21 .

d.)In LCS problem for strings AGGTAB ,GXTXAYB the LCS was GTAB.

4.)Outputs:



5.)Conclusion :

Hence the nth element of the Fibonacci series was calculated using brute force approach, top bottom and bottom approach also the longest common subsequence was found out using two input strings.