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Algorithm Practical 10

Aim: WAP to find fibonacci series using dynamic programming

§ Algorithm:
1) Start
2) take fib function with parameter n and loop and main function
3) Use if loop for the conditions
4) return the variable lookup
5) take the initializing variable
6) print the fibonnaci number
7) Stop

Writeups
*1) Dynamic Programming
-> Dynamic Programming (DP) is mainly an optimization over plain recursion.
2) Whenever we see a recursive solution that has repeatedly calling the same inputs we can optimize it using DP
3) Value can be stored in two ways
i) Memorization (Top Down)
-> It is a small modification that it looks into a lookup table to be before computing solution.
ii) Tabulation (Bottom up)
-> It builts a b table in bottom up fashion and returns the last entry from table

*2) Fibonacci Series
-> It is the sum of two preceding numbers starting from 0 and 1.

prac 10.py - E:/fffiiles/college pracs and projects/Algorithm/prac 10.py (3.8.3)

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```
# Function to calculate nth Fibonacci number
def fib(n, lookup):

    # Base case
    if n == 0 or n == 1 :
        lookup[n] = n

    # If the value is not calculated previously then calcu
    if lookup[n] is None:
        lookup[n] = fib(n-1 , lookup)  + fib(n-2 , lookup)

    # return the value corresponding to that value of n
    return lookup[n]
# end of function

# Driver program to test the above function
def main():
    n = 34
    # Declaration of lookup table
    # Handles till n = 100
    lookup = [None]*(101)
    print ("Fibonacci Number is ", fib(n, lookup))

if __name__=="__main__":
    print("Neeraj Appari S073")
    main()
```

Python 3.8.3 Shell

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```
Python 3.8.3 (tags/v3.8.3:6f8c832, May 13 2020, 22:20:19) [
v.1925 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more
formation.
>>>
===== RESTART: E:/fffiiles/college pracs and projects/Algor
m/prac 10.py =====
Neeraj Appari S073
Fibonacci Number is  5702887
>>>
```