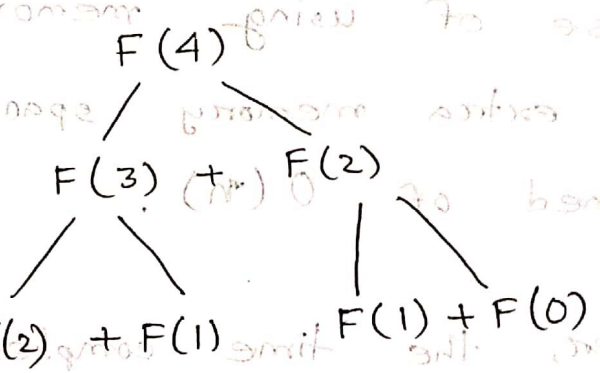
Task 2 (a) :-

⇒ Implementation 1 :-

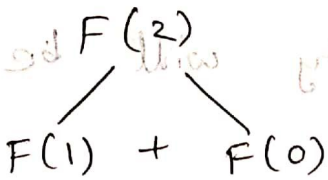
Here the recurrence relation is,

$$F(n) = F(n-1) + F(n-2) + c$$

For visualization, let, $n = 4$,



And, for $n = 2$,



For any case, the time complexity is,

$$O(2^{n-1} - 1)$$

$$= O(2^{n-1})$$

$$= O\left(\frac{2^n}{2}\right)$$

$= O(2^n)$

And, the space complexity will be $O(1)$.

⇒ Implementation 2 :-

Because of using memoization technique, some extra memory space would be consumed of $O(n)$.

However, the time complexity will reduce drastically. we are using a single loop in this implementation. That's why, the time complexity will be $O(n)$.

Between implementation 1 and 2, the faster code execution will be of implementation 2. Because, exponential time algorithms are much slower than linear time algorithms.