## 4. Analysis

### Time Complexity

### ****Basic Recursive Version****: O(n) where n is the number of periods.

### Each recursive call reduces the problem size by 1

* Function gets called exactly n times

****Memoized Version****: O(n) time, but with O(n) space complexity

* Each unique (value, rate, period) combination is computed only once
* Subsequent calls return cached results

### Optimization Techniques

* ****Memoization (Caching)****

Stores previously computed results to avoid redundant calculations

Particularly useful if the same parameters are used repeatedly

* ****Iterative Approach****

Can be more efficient than recursion for this simple case: