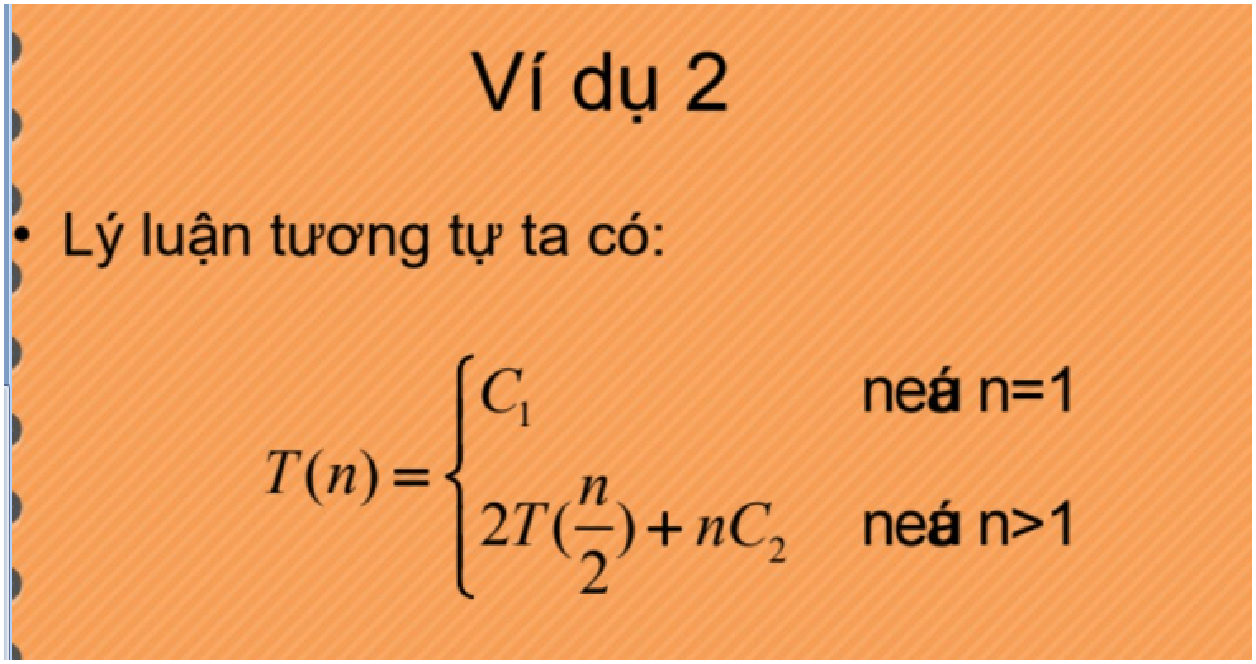
Đệ quy đuôi

c. Phân tích ra thừa số nguyên tố (bài tập).

```
function primeFactors(n)
    if n == 1 then
        return []
    end if
    for i = 2 to n do
        if n % i == 0 then
            return [i] + primeFactors(n / i)
        endif
    endfor
end
```



- Đăt k $= \lfloor \log_2 n \rfloor = \lfloor \log_2 n \rfloor$
- Ta có n $= (\overline{a_k \dots \dots a_0}) = (\overline{a_k \dots \dots a_0})$

$$T(\overline{a_k \dots \dots a_0}) = 2T(\overline{a_k \dots \dots a_1}) + 2^0 C_2$$

$$T(\overline{a_k \dots \dots a_1}) = 2T(\overline{a_k \dots \dots a_2}) + 2C_2$$

$$\Longrightarrow 2T(\overline{a_k \dots \dots a_1}) = 2^2 T(\overline{a_k \dots \dots a_1}) + 2C_2$$

$$2^{k-1} T(\overline{a_k \dots \dots a_{k-1}}) = 2^k T\left(\overline{\mathrm{a}^{\mathrm{k}}}\right) + 2^{\mathrm{k}-1} \mathrm{C}_2$$

$$\Longrightarrow (\overline{a_k \dots \dots a_0}) = 2^k T\left(\overline{\mathrm{a}^{\mathrm{k}}}\right) + \mathrm{C}_2 \sum_{\mathrm{i}=0}^{\mathrm{k}-1} 2^{\mathrm{i}}$$

$$= 2^k T\left(\overline{a^k}\right) + C_2(2^k - 1)$$

$$= 2^k C_1 + \mathrm{C}_2\left(2^{\mathrm{k}} - 1\right)$$

$$= O(n)$$