

## Taller de Análisis

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procedure misterio (n: Integer)
var
  Contador, i, j, K : Integer
begin
  contador := 0
  for i := 1 to n-1 do
    for j := i+1 to n do
      for k := 1 to j do
        contador := contador + 1
      end
    end
  end
end
  
```

i → 4		n → 5	
i	j	K (to j)	Contador
1	2	1, 2	2
	3	1, 2, 3	3
	4	1, 2, 3, 4	4
	5	1, 2, 3, 4, 5	5
2	3	1, 2, 3	3
	4	1, 2, 3, 4	4
	5	1, 2, 3, 4, 5	5
3	4	1, 2, 3, 4	4
	5	1, 2, 3, 4, 5	5
4	5	1, 2, 3, 4, 5	5

Total: 40



## Representation

$$T(n) = \sum_{i=1}^{n-1} \sum_{j=i+1}^n \sum_{k=1}^1 1$$

$$\sum_{i=1}^n i = \frac{n(n+1)}{2} - \frac{i(i+1)}{2}$$

$$\begin{aligned} T(n) &= \sum_{i=1}^{n-1} \left( \frac{n(n+1)}{2} - \frac{i(i+1)}{2} \right) \\ &= (n-1) \cdot \frac{n(n+1)}{2} - \frac{1}{2} \sum_{i=1}^{n-1} i(i+1) \end{aligned}$$

$$\sum_{i=1}^{n-1} i(i+1) = \frac{(n-1)n(n+1)}{3}$$

$$T(n) = \frac{(n-1)n(n+1)}{2} \left( 1 - \frac{1}{3} \right)$$

$$= \frac{(n-1)n(n+1)}{2} \left( \frac{2}{3} \right)$$

$$= \frac{(n-1)n(n+1)}{3}$$

$$T(5) = \frac{(5-1)(5)(5+1)}{3}$$

$$= \frac{4(5)(6)}{3}$$

$$= 40 //$$