Tópicos Avançados em Estrutura de Dados

Atividade 1

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Questão 1

a)

$$int\ x = 30 \longrightarrow \sigma rec + \sigma arm = \mathbf{2} \quad (1)$$
$$int\ i = 0 \longrightarrow \sigma rec + \sigma arm = \mathbf{2} \quad (2)$$
$$i < n \longrightarrow 2 * \sigma rec + \sigma op = \mathbf{3(n+1)} \quad (3)$$
$$i++ \longrightarrow 2 * \sigma rec + \sigma op + \sigma arm = \mathbf{4n} \quad (4)$$
$$x = x + 2 - i \longrightarrow 3 * \sigma rec + 2 * \sigma op + \sigma arm = \mathbf{6} \quad (5)$$
$$\mathbf{Fórmula} \longrightarrow \mathbf{7n + 13} \quad (6)$$

b)

$$int\ abc = 30 \longrightarrow \sigma arm + \sigma rec = \mathbf{2} \quad (1)$$
$$for$$
$$int\ i = 1 \longrightarrow \sigma rec + \sigma arm = \mathbf{2} \quad (2)$$
$$i < n - 1 \longrightarrow (n-1) * (3\sigma rec + \sigma op + \sigma arm) = \mathbf{5(n\text{-}1)} \quad (3)$$
$$i++ \longrightarrow (n-2) * (2\sigma rec + \sigma op + \sigma arm) = \mathbf{4(n\text{-}2)} \quad (4)$$
$$abc* = 2 \longrightarrow 2\sigma rec + \sigma op + \sigma arm = \mathbf{4} \quad (5)$$
$$abc++ \longrightarrow 2\sigma rec + \sigma op + \sigma arm = \mathbf{4} \quad (6)$$
$$\mathbf{Fórmula} \longrightarrow \mathbf{9n - 1} \quad (7)$$

c)

$$int\ x = 30 \longrightarrow\ \sigma arm + \sigma rec = \mathbf{2} \quad (1)$$
$$int\ i = 0 \longrightarrow\ \sigma arm + \sigma rec = \mathbf{2} \quad (2)$$
$$while(i < n) \longrightarrow\ n(\sigma rec + \sigma op + \sigma rec) = \mathbf{3n} \quad (3)$$
$$x = x + 2 - i \longrightarrow\ \sigma arm + \sigma rec + \sigma op + \sigma rec \sigma rec + \sigma op = \mathbf{6} \quad (4)$$
$$i = i + 1 \longrightarrow\ \sigma arm + \sigma rec + \sigma op + \sigma rec = \mathbf{4} \quad (5)$$
$$\mathbf{Fórmula} \longrightarrow \mathbf{3n + 14} \quad (6)$$

d)

$$int\ abc = 30; \longrightarrow \sigma rec + \sigma arm = \mathbf{2} \quad (1)$$
$$int\ i = 1; \longrightarrow \sigma rec + \sigma arm = \mathbf{2} \quad (2)$$
$$abc* = 2; \longrightarrow 2\sigma rec + \sigma op + \sigma arm = \mathbf{4(n\text{-}2)} \quad (3)$$
$$abc++; \longrightarrow 2\sigma rec + \sigma op + \sigma arm = \mathbf{4(n\text{-}2)} \quad (4)$$
$$i = i + 1; \longrightarrow 2\sigma rec + \sigma op + \sigma arm = \mathbf{4(n\text{-}2)} \quad (5)$$
$$while(i < n - 1); \longrightarrow 3\sigma rec + 2\sigma op = \mathbf{5(n\ -\ 3)} \quad (6)$$
$$\mathbf{Fórmula} \longrightarrow \mathbf{17n\ -\ 35} \quad (7)$$

Questão 2

Primeira linha: $int\ resultado = a[n-1]$
$\sigma rec(a) + \sigma rec(n) + \sigma rec(1) + \sigma subt + \sigma rec(a[n-1]) + \sigma.(calcularoendereco) +$
$\sigma arm(em\ int\ resultado)$;
$\therefore$ **7 operações.**

Segunda linha: $for(i = 0;\ i < a.length;\ i++)$
$\sigma rec(0) + \sigma arm(emi)$;
$(a.length + 1) * (\sigma rec(i) + \sigma rec(a.length) + \sigma <)$;
$(a.length) * (\sigma rec(i) + \sigma rec(1) + \sigma soma + \sigma arm(emi))$;
$\therefore$ **7(a.length) + 5 operações.**

Terceira linha: $resultado = resultado * x + a[i]$
$(a.length) * (\sigma rec(resultado) + \sigma rec(x) + \sigma mult + \sigma rec(a) + \sigma rec(i) + \sigma.(calculodoendereco) +$
$\sigma rec(a[i]) + \sigma soma + \sigma arm(emresultado))$;
$\therefore$ **9 (a.length) operações.**

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$\therefore$ **Operações no total: 12 + 16 (a.length)**