

Ejercicio 1

a)

If $cond = \text{True}$ then $n + m > 10$ fi

b)

$(m > 0) \vee (x = 3, 14) \wedge \neg(m > 0 \wedge x = 3, 14)$

c)

If $(|v| > 0) \wedge (v[0] = 5)$ then $str = \text{"Hola"}$ fi

Hay que aclarar que el vector no puede estar vacío para que no quede indefinido.

d)

$|v| > 0 \Rightarrow v[0] - m = n$

Hay que aclarar que el vector no puede estar vacío para que no quede indefinido.

Ejercicio 2

- Indefinido (división por cero)
- Falso ($vec[3] = 0$)
- Indefinido (no existe $vec[5]$)
- Falso ($\text{True} \Rightarrow \text{False} \equiv \text{False}$)

Ejercicio 3

a)

$(\nexists i : int)(0 \leq i < |str|) \Rightarrow (str[i] = \text{'x'})$

b)

$(\forall i : int)(\exists m : int)(0 \leq i < |m|)(0 \leq m < |vec|) \Rightarrow v[i] = 0$

c)

$$(\forall i : \text{int})(0 \leq i < |\text{vec}|) \Rightarrow m < \sum_i^{|\text{vec}|-1} v[i] < n$$

d)

$$(\exists m : \text{int})(0 \leq m < |\text{vec}|) \Rightarrow \text{esMaximo}(\text{vec}, m)$$

$$\text{esMaximo}(\text{vector}<\text{int}> v, \text{int } m) \equiv (\forall i : \text{int})(0 \leq i < |v|) \Rightarrow v[i] \leq v[m]$$

Ejercicio 5

a)

$$\text{contarPares}(v:\text{vector}<\text{int}>):\text{int} \equiv \sum_{i=0}^{|v|-1} (\beta(\text{esPar}(v[i])))$$

$$\text{esPar}(i:\text{int}):\text{bool} \equiv \text{true} \Leftrightarrow i \bmod 2 = 0$$

b)

$$\text{sumarPrimosHastaI}(v:\text{vector}<\text{int}>, i:\text{int}):\text{int} \equiv \sum_{j=0}^i (v[j] \cdot \beta(\text{esPrimo}(v[j])))$$

c)

$$\text{promedio}(v:\text{vector}<\text{float}>):\text{float} \equiv \frac{1}{|v|-1} \cdot \sum_{i=0}^{|v|-1}$$

d)

$$\text{contarVocales}(\text{txt}:\text{vector}<\text{char}>):\text{int} \equiv \sum_{i=0}^{|\text{txt}|-1} \beta(\text{esVocal}(\text{txt}[i]))$$

$$\text{esVocal}(c:\text{char}):\text{bool} \equiv \text{True} \Leftrightarrow (c = \text{'a'}) \vee (c = \text{'e'}) \vee (c = \text{'i'}) \vee (c = \text{'o'}) \vee (c = \text{'u'})$$

Ejercicio 6

a)

string n_asteriscos(int n)

Pre: $(n \geq 0)$ Post: $(|res| = n) \wedge \text{sonTodosAsteriscos}(res)$

$$\text{sonTodosAsteriscos}(s:\text{string}):\text{bool} \equiv \text{True} \Leftrightarrow (\forall i : \text{int})(0 \leq i < |res| \Rightarrow res[i] = \text{'*'})$$

b)

int cantidad_a(string s)

Pre: \top Post: $res = \text{contar_a}(s)$ $\text{contar_a}(s:\text{string}):\text{int} \equiv \sum_{i=0}^{|s|-1} \beta(\text{es_A}(s[i]))$ $\text{es_A}(\text{char } c):\text{bool} \equiv \text{if } (c = 'a') \text{ then True else False fi}$ **c)**

vector<int> rep_base2(int n)

Pre: $n \geq 0$ Post: $(|res| = \text{parteEntera}(n)+1) \wedge (\forall i:\text{int})(0 \leq i < |res| \Rightarrow res[i] = \frac{n}{2^{|res|-i} \bmod 2})$ $\text{parteEntera}(n:\text{int}):\text{int} \equiv \max\{k \in \mathbb{Z} : k \leq n\}$ **d)**

int trans_base2(vector<int> v)

Pre: $(|v| > 0) \wedge (\forall i:\text{int})(0 \leq i < |v| \Rightarrow \text{esCero}(v[i]) \vee \text{esUno}(v[i]))$ Post: $res = \sum_{i=0}^{|v|-1} (v[i] \cdot 2^{|v|-i})$