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Array Mapping Function - Homework

1)

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| --- | --- |
| **Declaration** | **address** |
| Integer list [1..100] | list [10] |
| integer list [0..10, 0..20]; | list [5, 12] |
| integer list [-5..5, -1..12]; | list [3, 8] |

Location (list [10]) = **136**

Formula: base + (n-lower) \* esize

n = 10 , lower = 0 , esize = 4, base = 10

100 + (10-0) \* 4 = 136

Location (list [5, 12]) = **568**

Formula: base + [i1 - L1) \* ( U2 - L2 + 1) + (i2 - L2)] \* esize

L1 = 0, U1 = 10, L2 = 0, U2 = 20, i1 = 5, i2 = 12, base = 100, esize = 4

100 + [(5-0) \* (20-0+1) + (12-0)] \* 4 = 568

Location (list [3, 8]) = **584**

Formula: base + [i1 - L1) \* ( U2 - L2 + 1) + (i2 - L2)] \* esize

L1 = -5, U1 = 5, L2 = -1, U2 = 12, i1 = 3, i2 = 8, base = 100, esize = 4

100 + [(3+5) \* (12+1+1) + (8+1)] \* esize = 584

2)

Column major formula:

Location( list [i1, i2] ) = **base + [(i1-L1) + (U1 - L1 + 1) \* (i2 - L2)] \* esize**

Rows to skip to get to correct row our element is located = (i1-L1)

columns to skip to get to correct column our element is located = (i2 -L2)

Elements in each column = (U1 - L1 + 1)

starting location for the column our element is located = base + (U1 - L1 + 1) \* (i2 - L2)