Main Core (High-level)	Main Core (Assembly)	Monitoring Core
1: int *x = malloc(4*sizeof(int));	1: call malloc ;return pointer 0x12340000 in r1	1: rf_metadata[1] = (r1 << 32) | (r1 + 0xf) // = 0x1234000001234000f
2: int *y = x + 2;	2: add r2, r1, #8	2: rf_metadata[2] = rf_metadata[1]
3: x[3] = 1;	3a: mov r3, #1	3a: rf_metadata[3] = NULL

	3b: str r3, [r1, #12] ; store to 0x1234000c	3b: if (r1 + 12 < base(metadata[1]) ||
		r1 + 12 > bound(metadata[1])) {
		// raise error
		}
		mem_metadata[r1 + 12] = rf_metadata[3];

4: y[3] = 1;	4: str r3, [r2, #12] ; store to 0x12340014	4: if (r2 + 12 < base(metadata[2]) ||
		r2 + 12 > bound(metadata[2])) {
		// raise error
		}
		mem_metadata[r2 + 12] = rf_metadata[3];