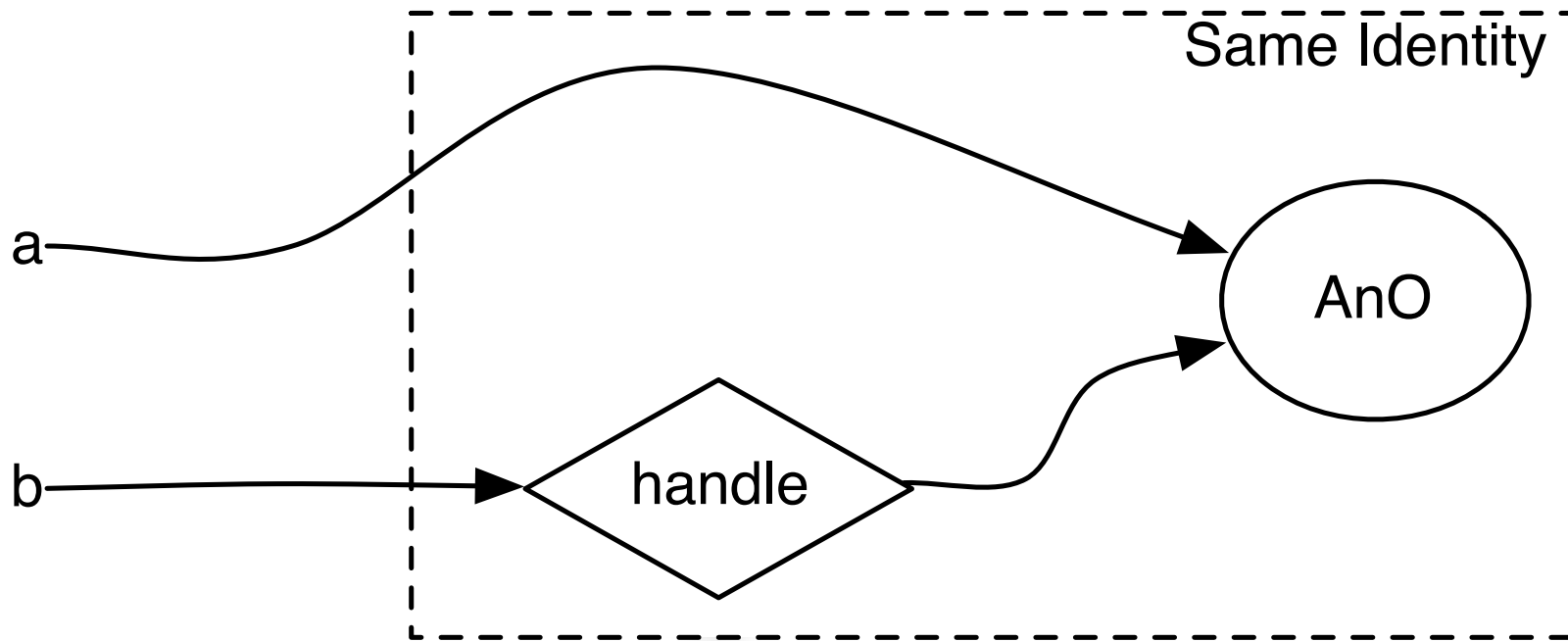


# Handle : a transparent proxy

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# Handle : identity

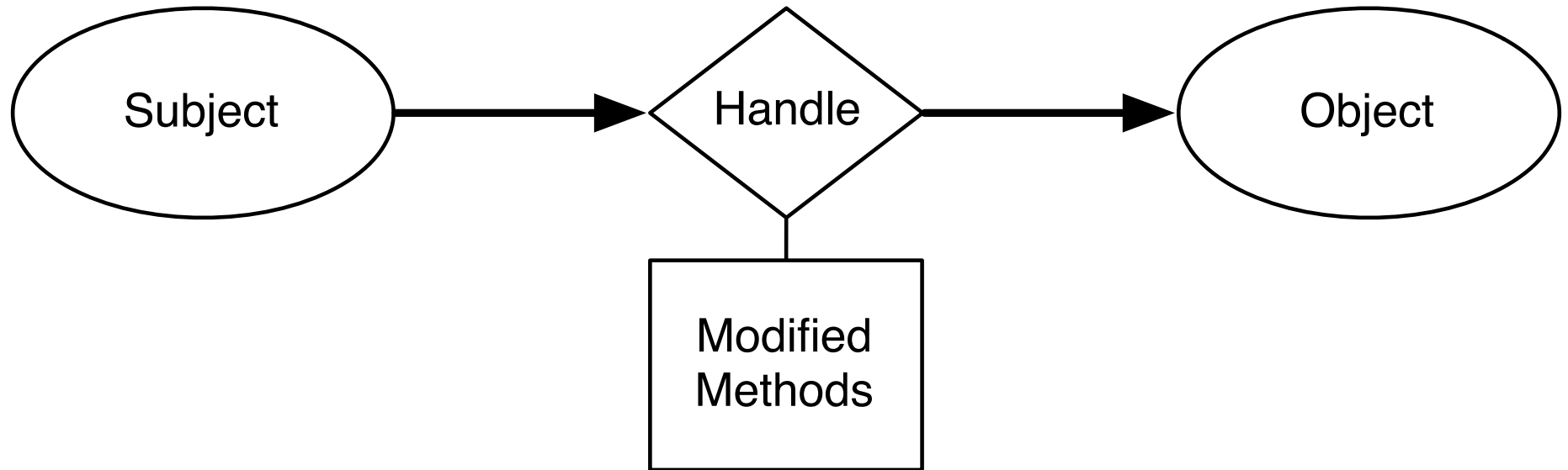


$a = \text{anO}$

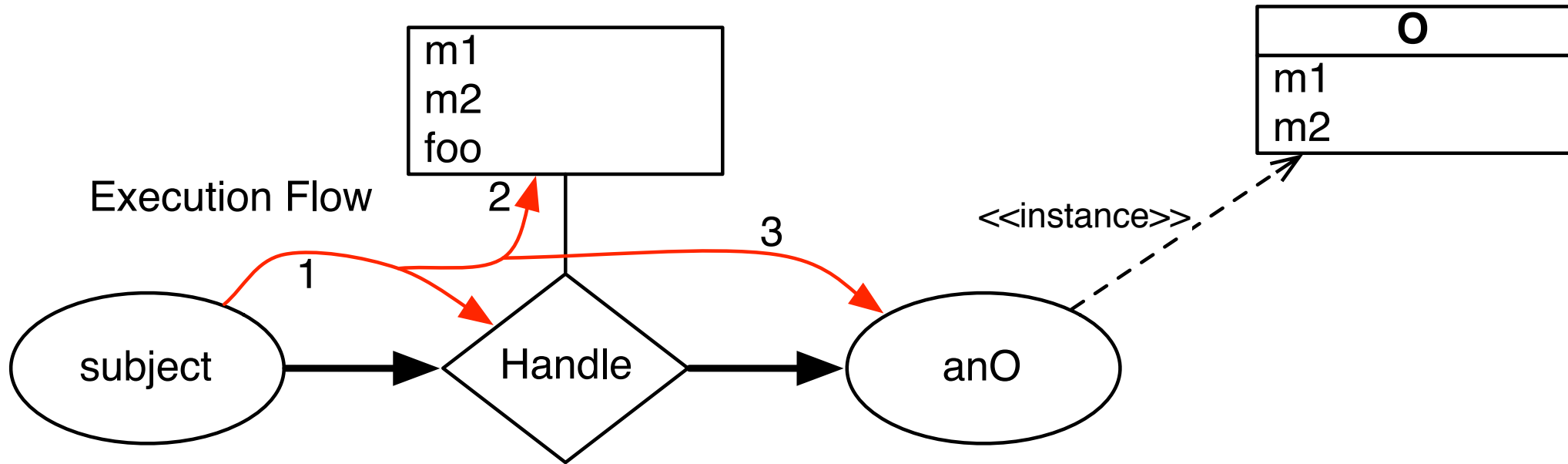
$b = \text{anO}$

$a == b$

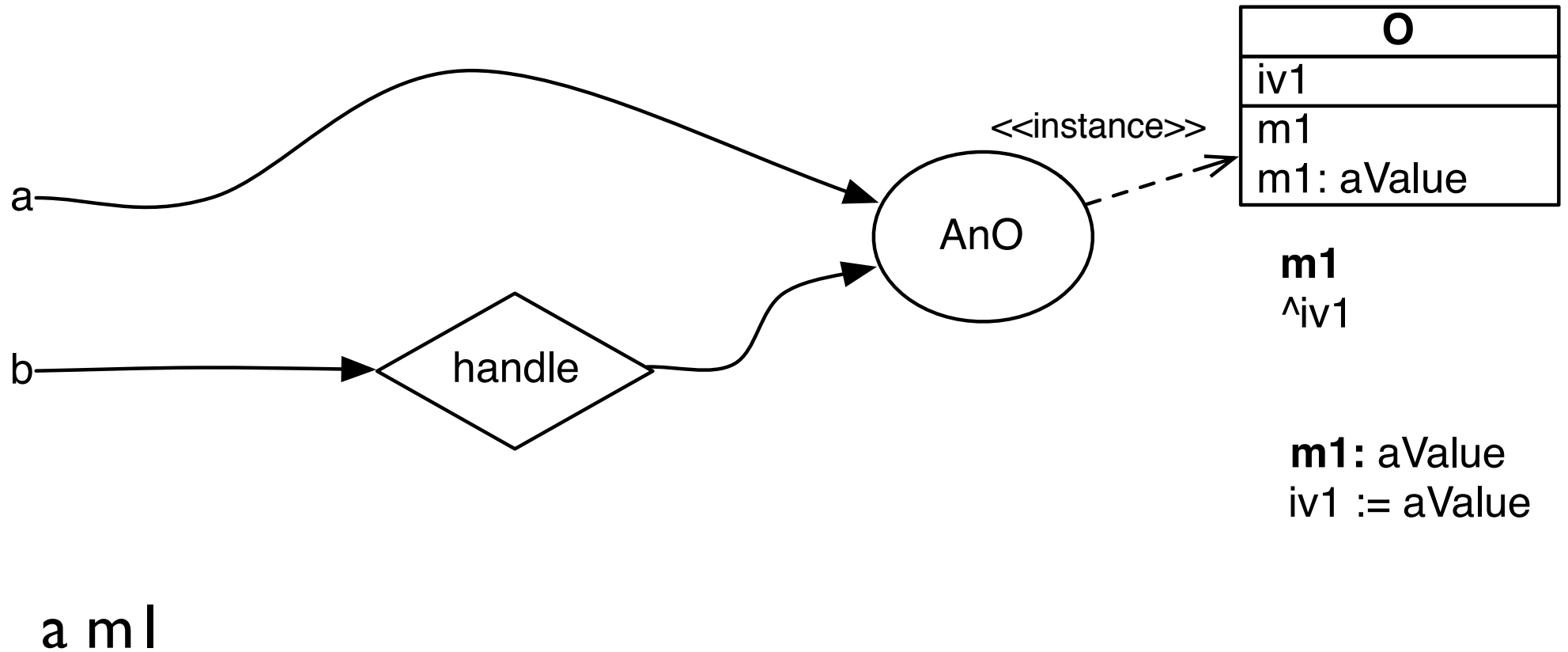
# Handle : behavior indirection



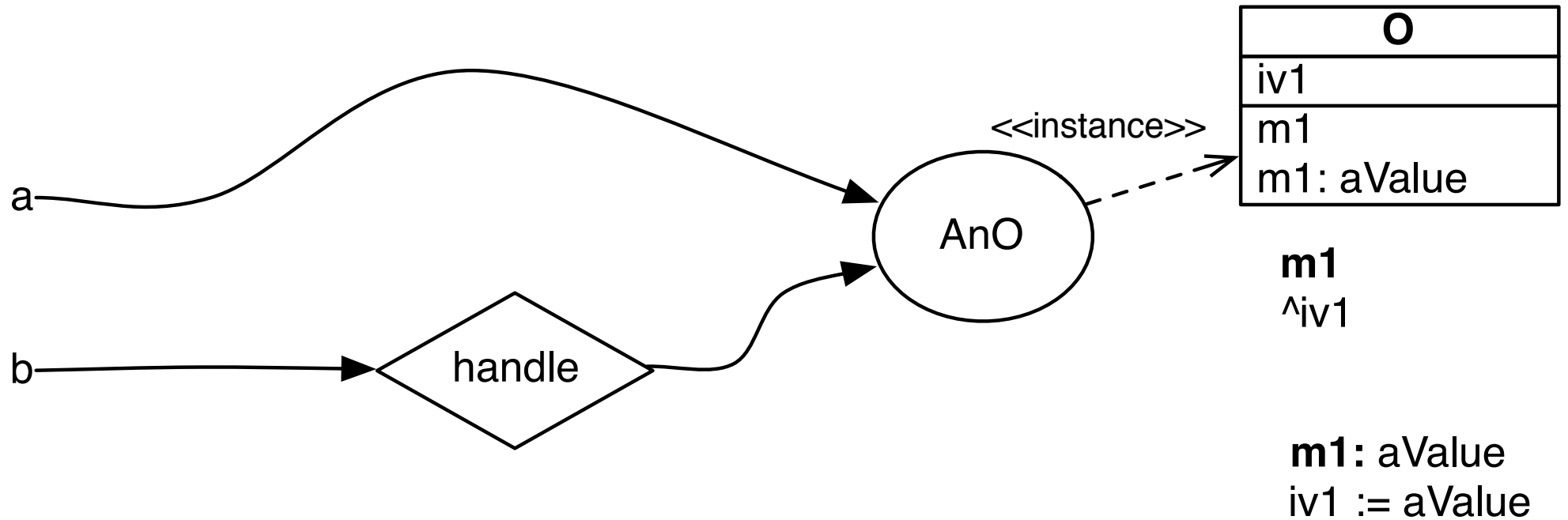
# Handle : behavior indirection



# Handle : state indirection

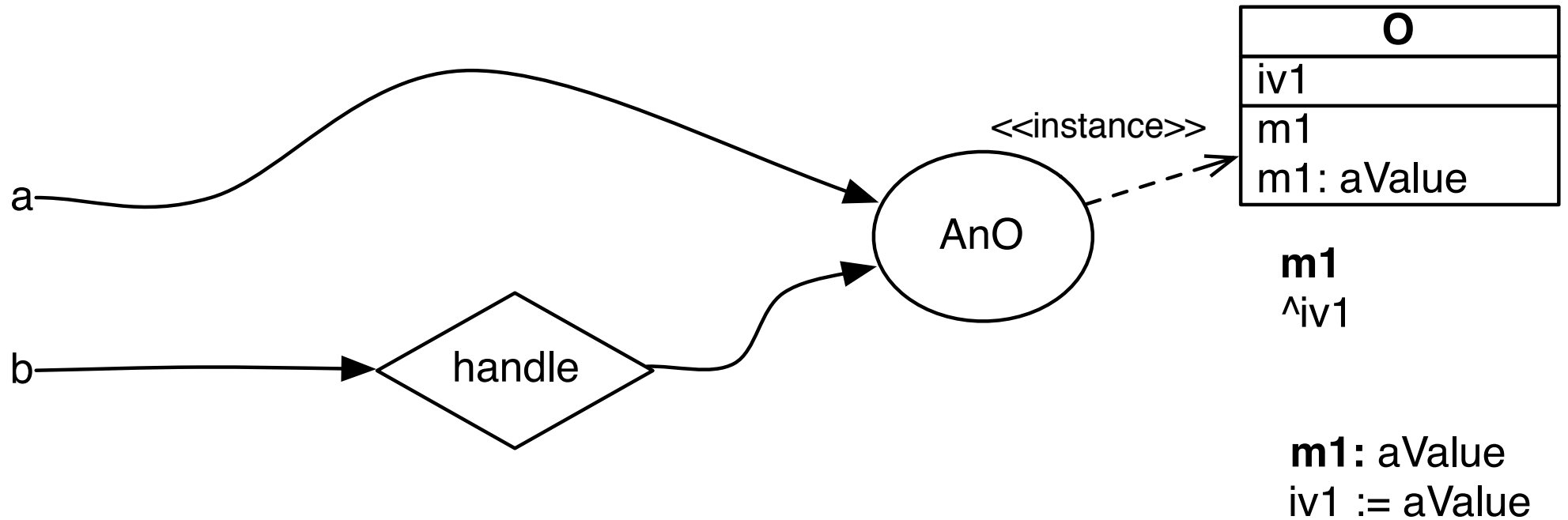


# Handle : state indirection



a m l 42

# Handle : state indirection

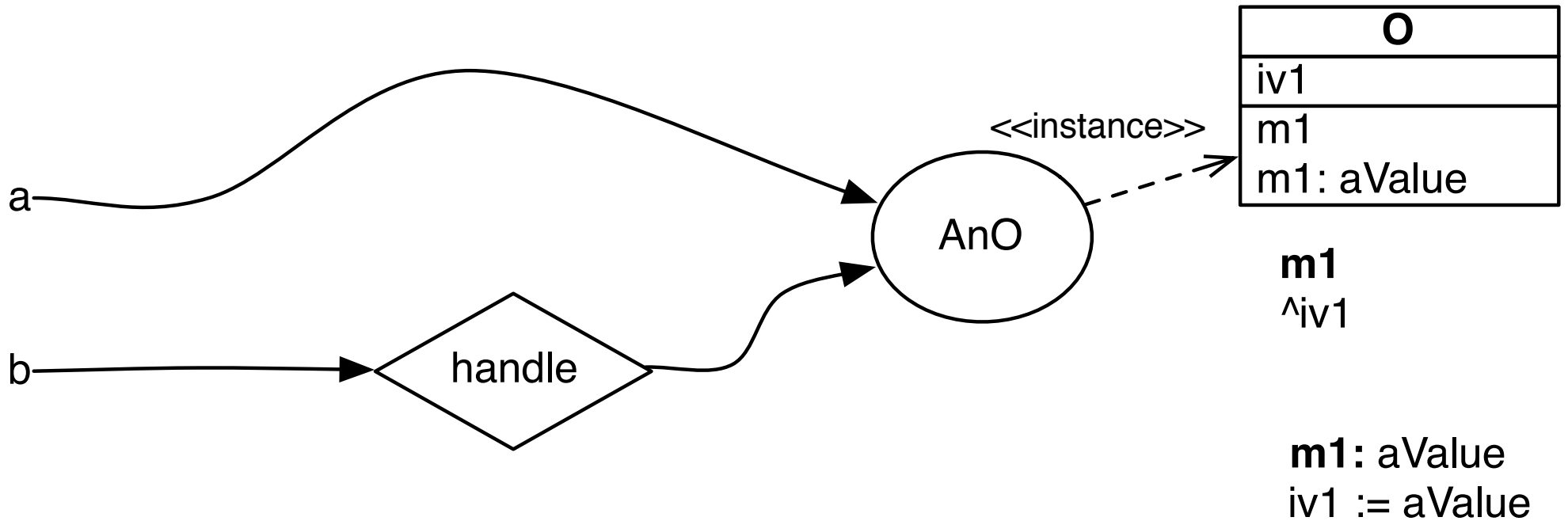


a m l 42

b m l: 23.

b m l.

# Handle : state indirection



a m1 42

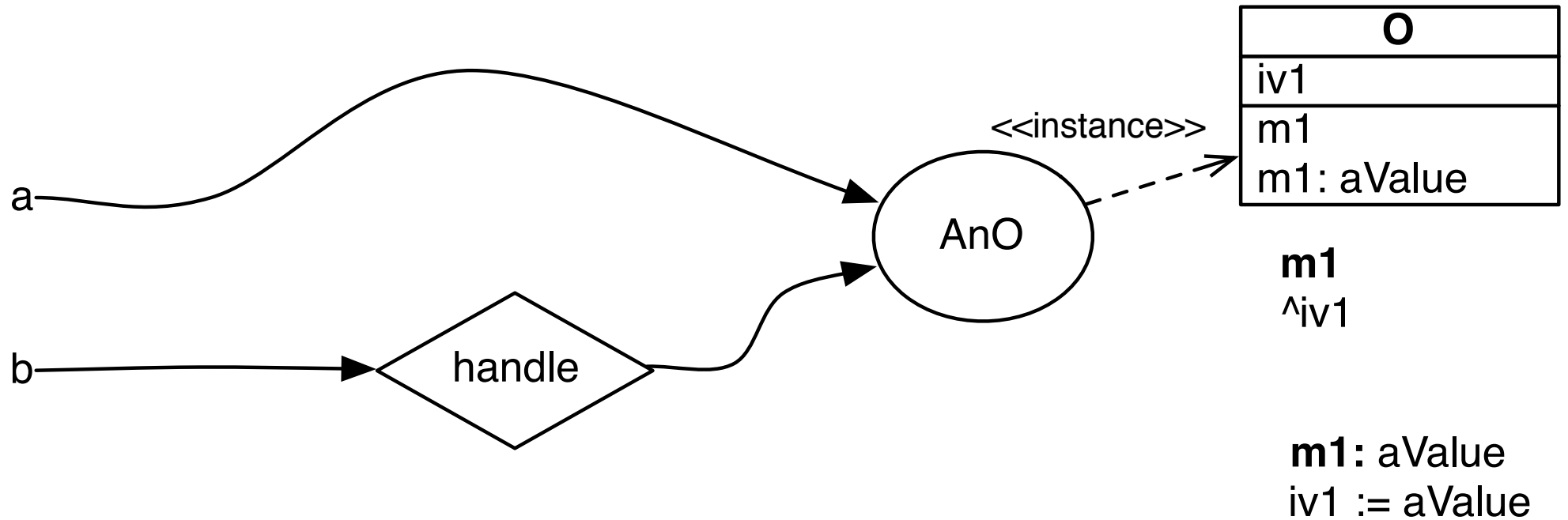
b m1: 23.

b m1. 23

a m1.



# Handle : state indirection



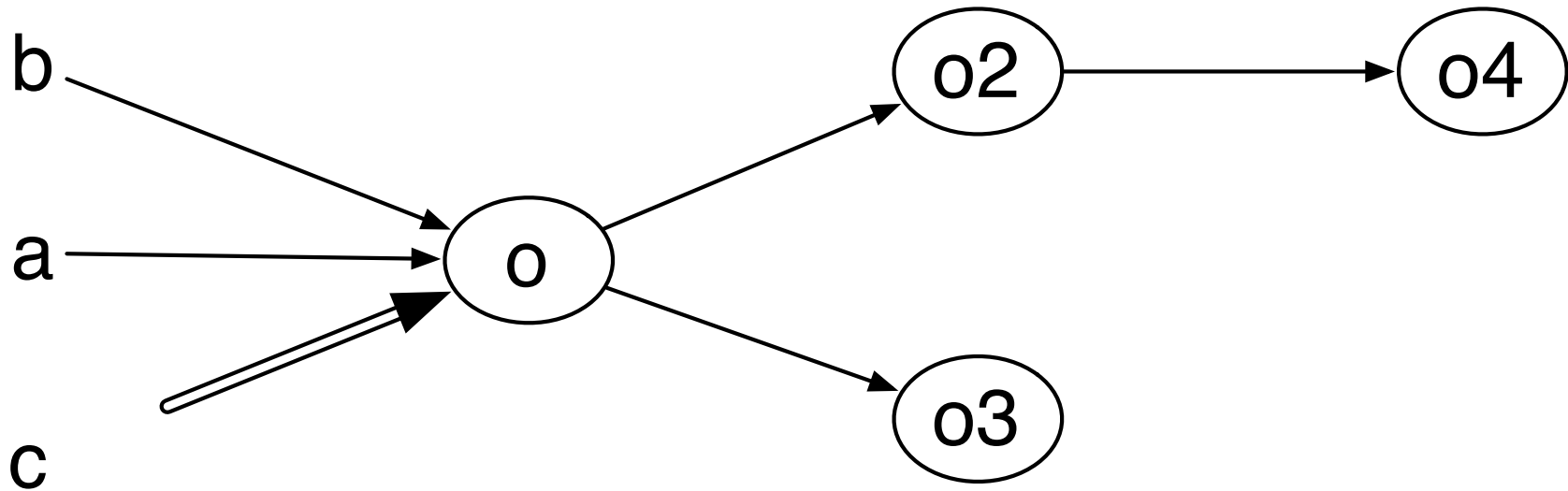
a m l 42

b m l: 23.

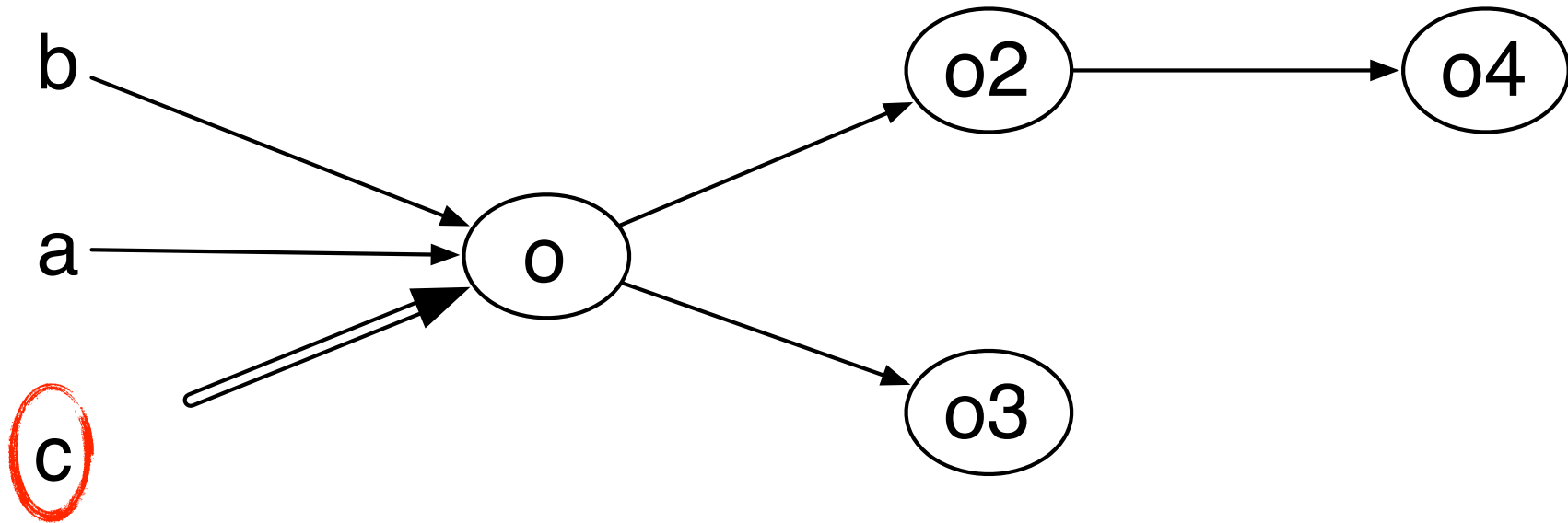
b m l. 23

a m l. 42

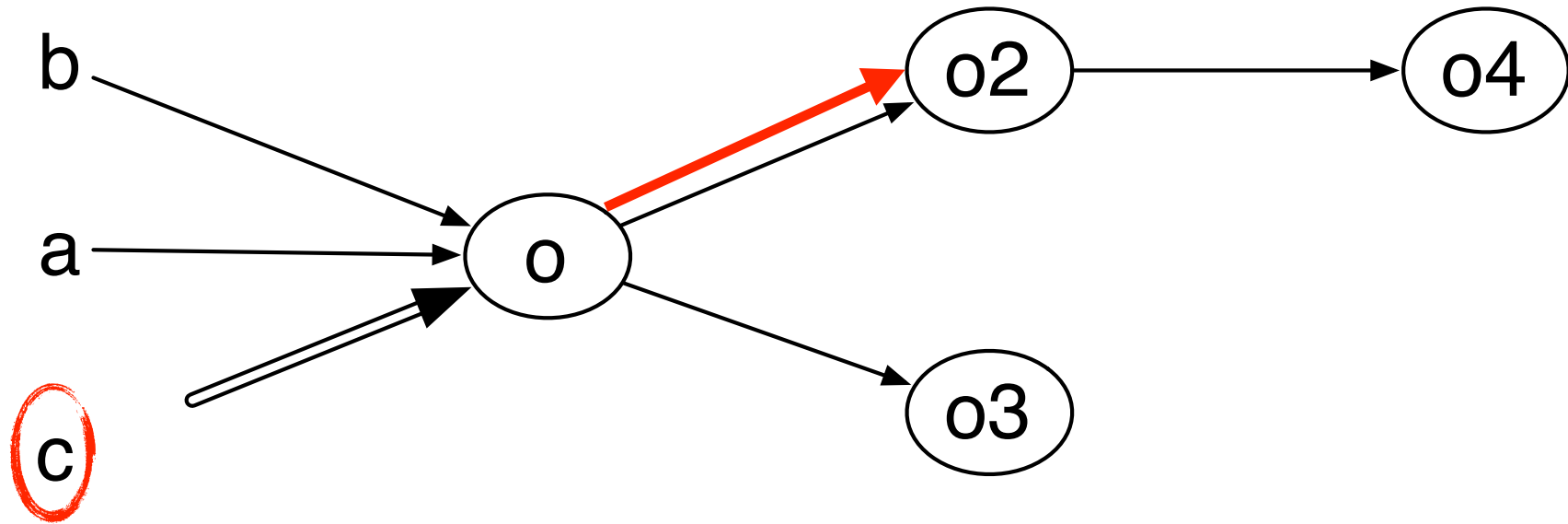
# Handle : propagation through object graph



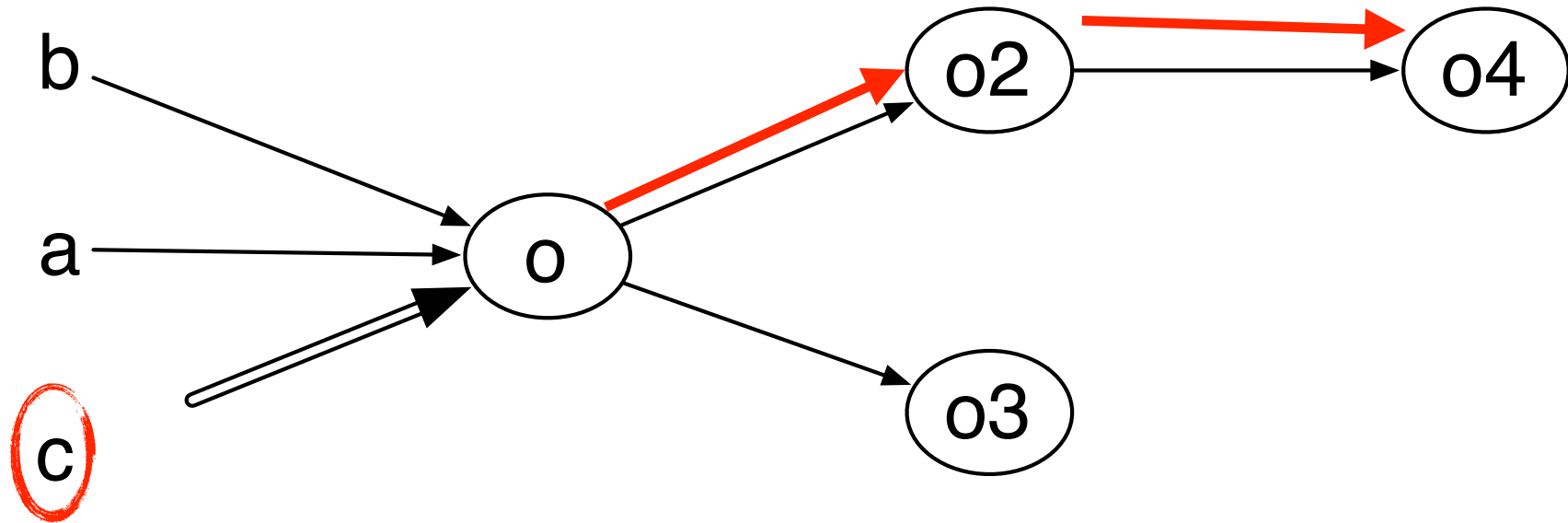
# Handle : propagation through object graph



# Handle : propagation through object graph



# Handle : propagation through object graph



# Implementation

- VM modification to create the “Handle”
  - ❖ Change the lookup
  - ❖ Intercept state accesses
  - ❖ The Handle representing the object aliased (same identity)

# Demo