

1 At Key

The operation *atKey* will return the Value v at some specified

- Top level Key k within KV

$$atKey(KV, k) \rightarrow v$$

- Nested location $K = \langle k_i..k_n..k_j \rangle$ within KV

$$atKey(KV, K) \rightarrow v$$

such that if KV is a collection of Key Value pair(s) $\langle k_0v_{k_0}, k_1v_{k_1} \rangle$ where

$$k_0 = abc \wedge v_{k_0} = 123$$

$$\Rightarrow$$

$$k_0v_{k_0} = abc \mapsto 123$$

and

$$k_1 = def \wedge v_{k_1} = xyz \mapsto 456$$

$$\Rightarrow$$

$$k_1v_{k_1} = def \mapsto xyz \mapsto 456$$

such that

$$KV = \langle abc \mapsto 123, def \mapsto xyz \mapsto 456 \rangle$$

When k is a single Key

- $k \notin KV$, *atKey* will return the representation of nothingness

$$atKey(KV, cba) = nil$$

- $k \in KV$, *atKey* will return v_k

$$atKey(KV, k_0) \Rightarrow atKey(KV, abc) = 123$$

$$atKey(KV, k_1) \Rightarrow atKey(KV, def) = xyz \mapsto 456$$

When K is a Collection of Key(s)

- $K \notin KV$, *atKey* will return the representation of nothingness

$$atKey(KV, \langle cba, 321 \rangle) = nil$$

- $k_i \in KV \wedge k_j \notin KV$, *atKey* will return the representation of nothingness

$$atKey(KV, \langle def, abc \rangle) = nil$$

- $k_i \in KV \wedge k_j \in KV$, *atKey* will return the nested value

$$atKey(KV, \langle def, xyz \rangle) = 456$$