1 Associate

The operation *associate* will return a modified KV' with a mapping of

- Key to Value added at a specified Key.

$$associate(KV, k, v) \rightarrow KV'$$

- Key to Value added at a specified nesting of Key(s).

$$associate(KV, < k_i..k_n..k_j >, v) \rightarrow KV'$$

such that if KV is a collection of Key Value pair(s) $< k_0 v_{k_0}, k_1 v_{k_1} >$ where

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

$$\Rightarrow$$

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

and

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

$$\Rightarrow$$

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

such that

$$KV =< abc \mapsto 123, \ def \mapsto xyz \mapsto 456 >$$

When k is a single Key

- $k \notin KV$, $k \mapsto v$ is added to KV to create KV'

$$associate(KV, baz, foo) = KV'$$

$$=$$

$$< abc \mapsto 123, \ def \mapsto xyz \mapsto 456, \ baz \mapsto foo >$$

- $k \in KV$, the previous mapping is overwritten to create KV'

$$associate(KV, abc, 789) = KV'$$

$$=$$

$$< abc \mapsto 789, \ def \mapsto xyz \mapsto 456 >$$

$$associate(KV, def, 456) = KV'$$

$$=$$

$$< abc \mapsto 123, \ def \mapsto 456 >$$

When k is a Collection of Key(s) $K =< k_i, k_j >$

- $K \notin KV$, $k_i \mapsto k_j \mapsto v$ is added to KV to create KV'

$$associate(KV, < baz, bar >, foo) = KV'$$

$$=$$

$$< abc \mapsto 123,\ def \mapsto xyz \mapsto 456,\ baz \mapsto bar \mapsto foo >$$

- $k_i \in KV\ \wedge k_j \notin v_{k_i}\ \wedge\ object?\,(v_{k_i}) = false$, the previous mapping at k_i is overwritten to create KV'

$$associate(KV, < abc, cba >, 789) = KV'$$

$$=$$

$$< abc \mapsto cba \mapsto 789,\ def \mapsto xyz \mapsto 456 >$$

- $k_i \in KV\ \wedge k_j \notin v_{k_i}\ \wedge\ object?\,(v_{k_i}) = true$, $k_j \mapsto v$ is added to k_i

$$associate(KV, < def, zyx >, fizbuz) = KV'$$

$$=$$

$$< abc \mapsto 123,\ def \mapsto < xyz \mapsto 456, zyx \mapsto fizbuz >>$$

- $k_i \in KV\ \wedge k_j \in v_{k_i} \Rightarrow object?\,(v_{k_i}) = true$, v_{k_j} is replaced with v

$$associate(KV, < def, xyz >, 654) = KV'$$

$$=$$

$$< abc \mapsto 123,\ def \mapsto xyz \mapsto 654 >$$