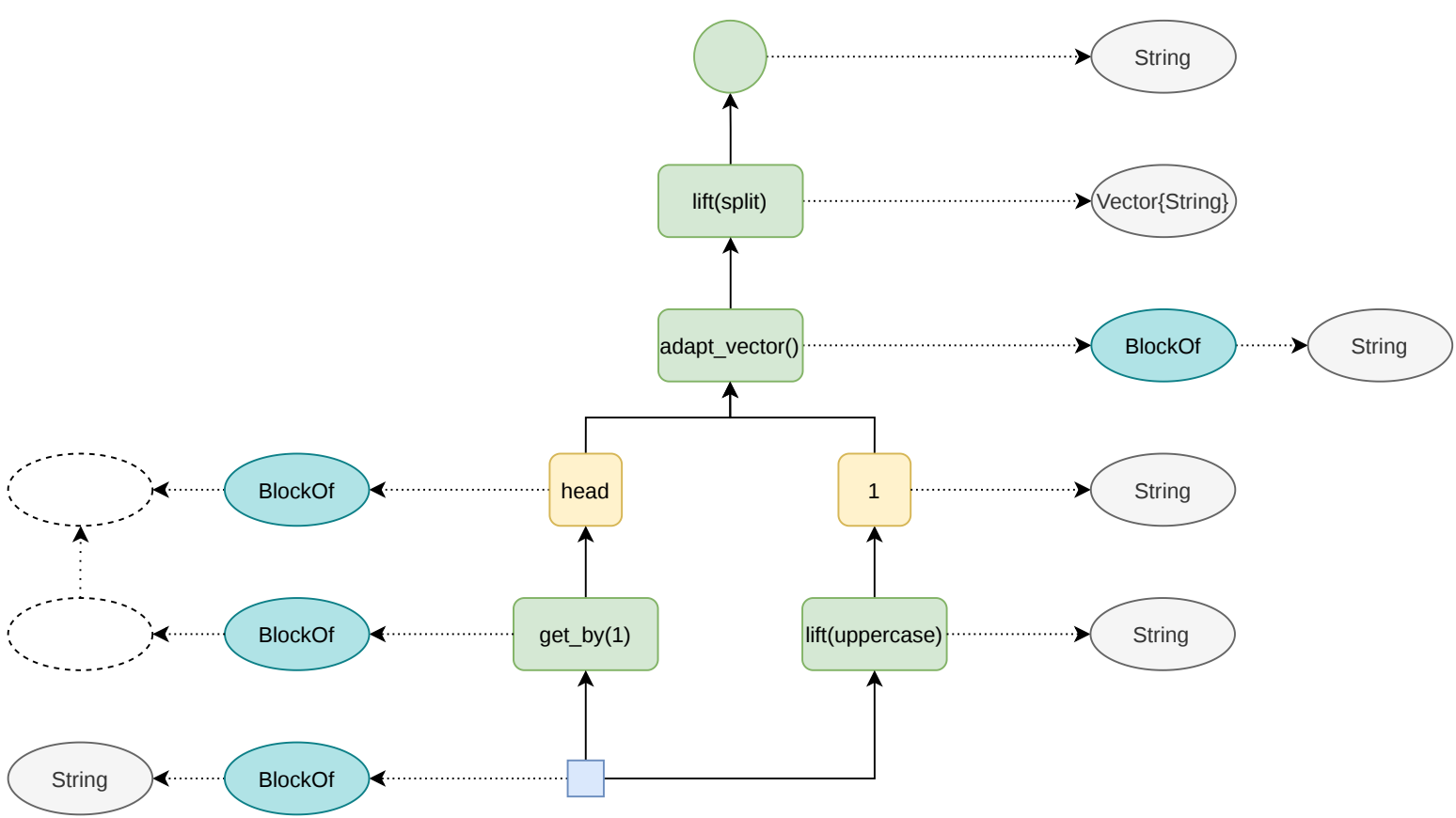




The diagram illustrates the transformation of a flat table into a hierarchical tree structure through a series of steps:

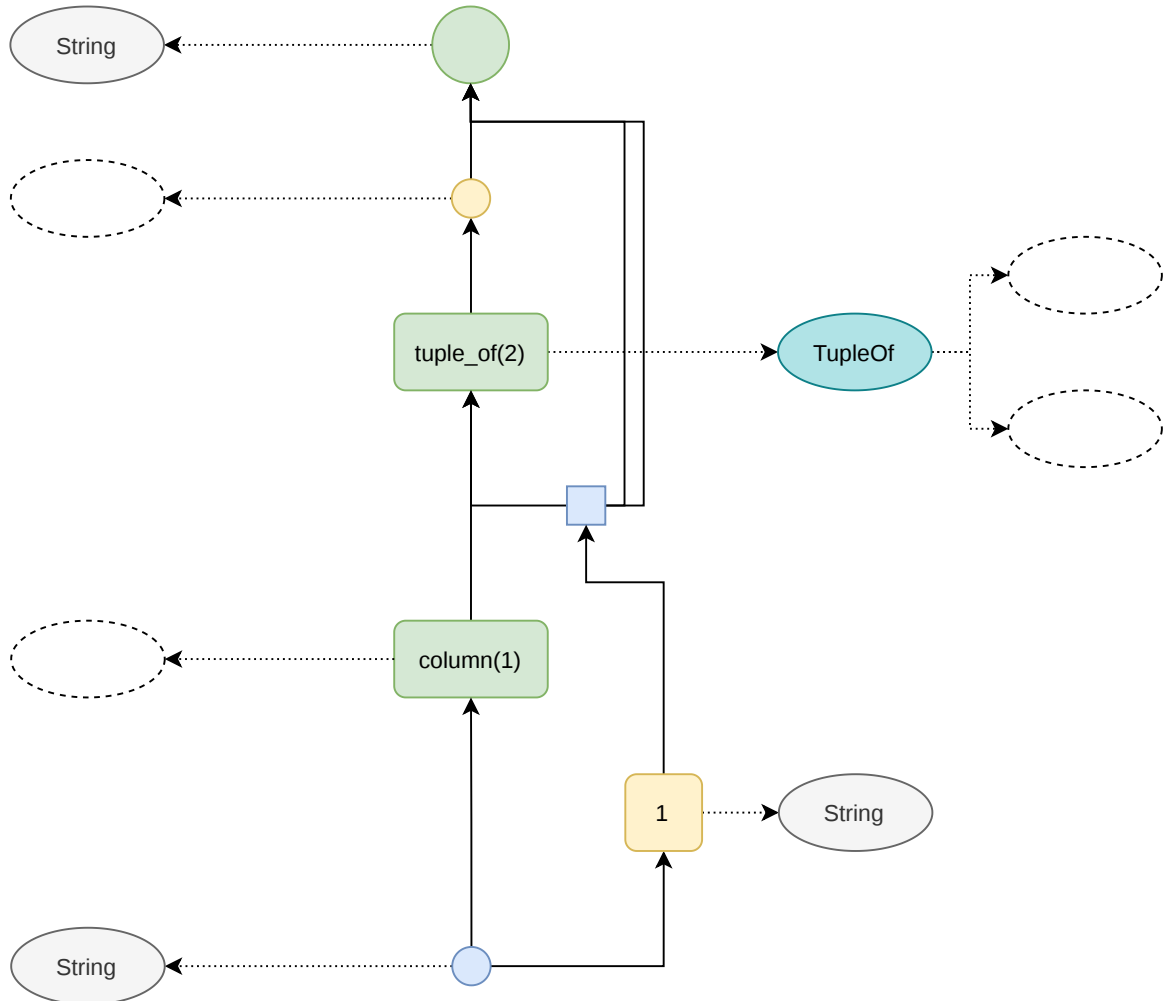
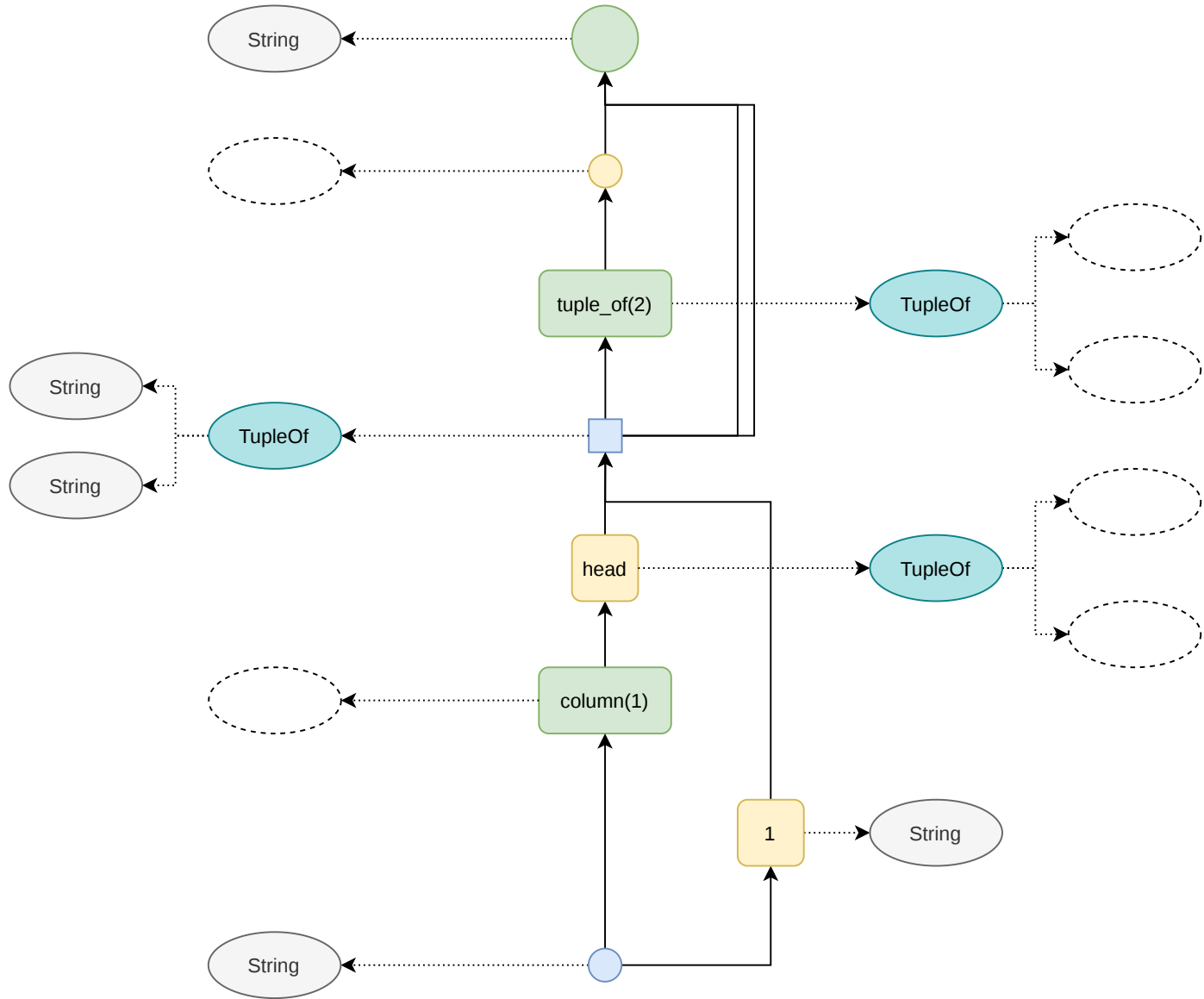
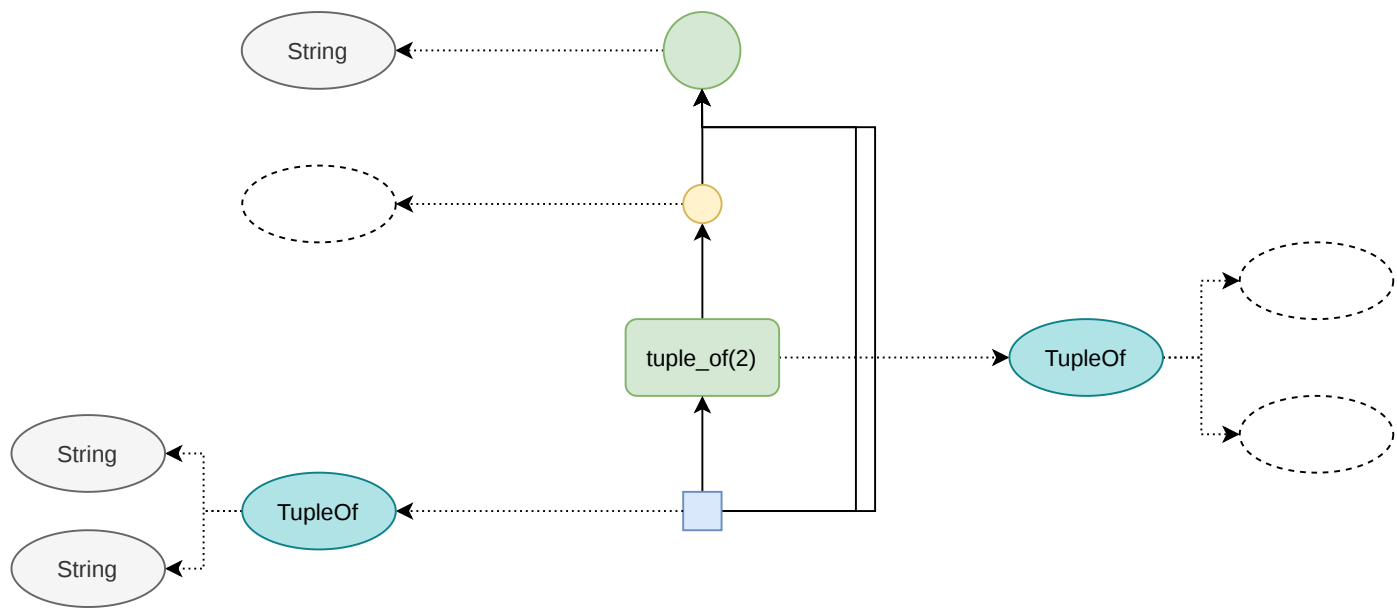
- Initial State:** A flat table with two columns: an index (1) and a value ("Hello World").
- Step 1:** The value is converted to a JSON string: `String["Hello", "World"]`.
- Step 2:** The string is parsed into a hierarchical structure. The root node branches into two children:
  - Child 1: A table with index 1 and value 1.
  - Child 2: A table with index 1 and value "Hello", and index 2 and value "World".
- Step 3:** The values are converted to uppercase:
  - Child 1: A table with index 1 and value 1.
  - Child 2: A table with index 1 and value "HELLO", and index 2 and value "WORLD".
- Step 4:** The structure is further transformed. The root node branches into two children:
  - Child 1: A table with index 1 and value 1, and index 2 and value 2.
  - Child 2: A table with index 1 and value "HELLO".
- Step 5:** The values are converted to lowercase:
  - Child 1: A table with index 1 and value 1, and index 2 and value 2.
  - Child 2: A table with index 1 and value "hello".
- Step 6:** The structure is further transformed. The root node branches into two children:
  - Child 1: A table with index 1 and value 1, and index 2 and value 3.
  - Child 2: A table with index 1 and value 1, and index 2 and value 2.
- Step 7:** The final state shows a hierarchical tree structure where the root node branches into two children, each of which further branches into two children, resulting in a total of eight leaf nodes.



wrap()



chain\_of(tuple\_of(2), column(1))



sieve\_by()

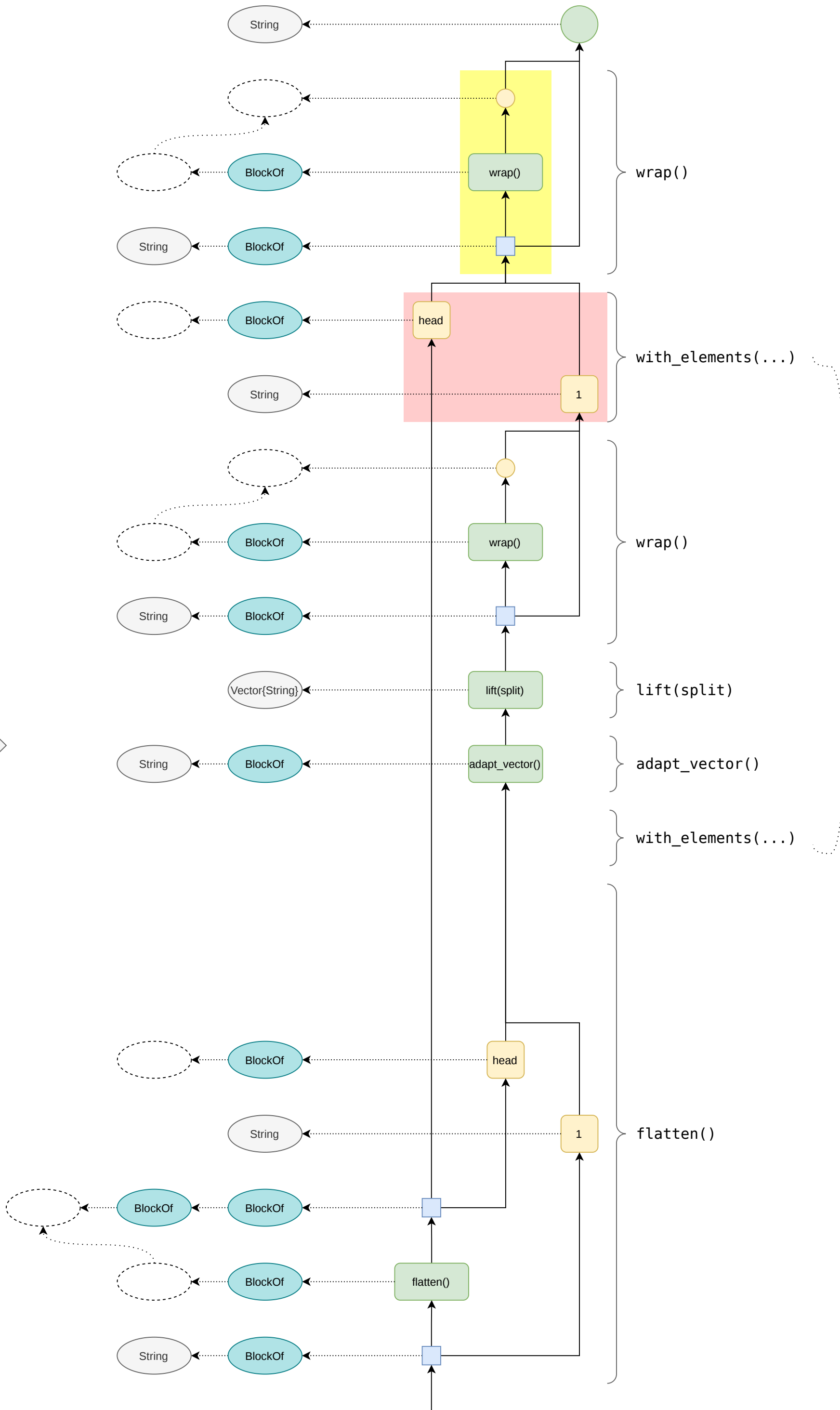


chain\_of(wrap(), block\_length())



@query "Hello World" split(it)

```
chain_of(
  wrap(),
  with_elements(
    chain_of(
      wrap(),
      lift(split),
      adapt_vector()),
    flatten())
```



untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline,Vector{NodeRef}}







@query "Hello World" split(it)

```
chain_of(
  wrap(),
  with_elements(
    chain_of(
      wrap(),
      lift(split),
      adapt_vector()),
    flatten())
```



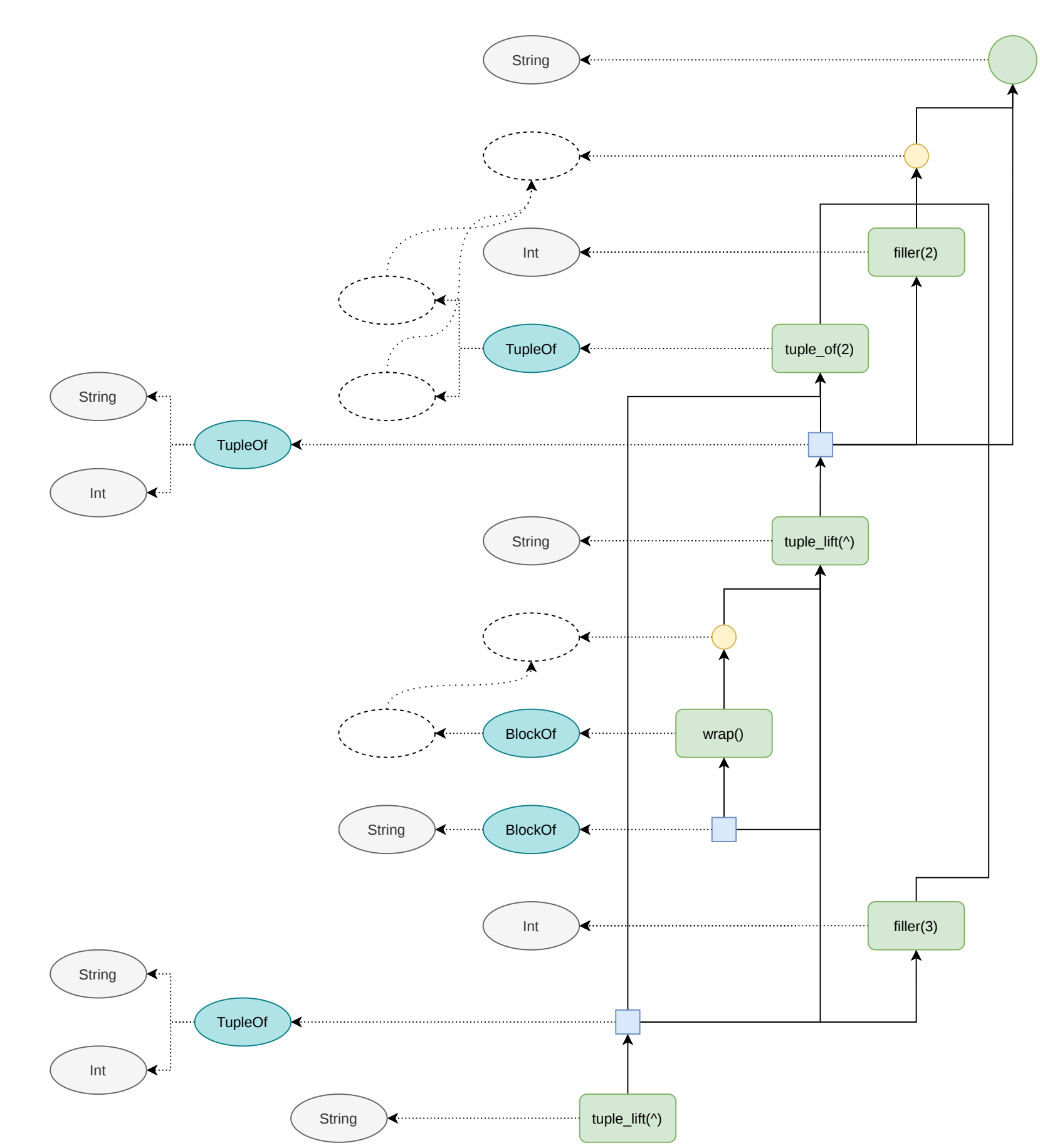




untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline,Vector{NodeRef}}

`chain_of(f, tuple_of(g, h)) => tuple_of(chain_of(f, g), chain_of(f, h))`

`{it ^ 2, (it ^ 2) ^ 3}`



`untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline,Vector{NodeRef}}`

@query "Hello World" split(it)

```
chain_of(
  wrap(),
  with_elements(wrap()),
  with_elements(lift(split)),
  with_elements(adapt_vector()),
  flatten())
```

