

```
chain_of(
    with_elements(load_postgres_table(("public", "patient"), ["id"], [Int32])),
    flatten())
```



```
chain_of(with_elements(load_postgres_table(("public", "patient"), ["id"], [Int32])),
  flatten(),
  with_elements(
    chain_of(
      load_postgres_table(("public", "patient"), ["mrn"], [String], ["id"]),
      block_cardinality(x1to1))),
  flatten()),
  with_elements(
    chain_of(
      output(),
      column(1))))
```









The diagram illustrates the mapping of a query plan to a typed relational algebra. The left side shows the query plan, and the right side shows the typed relational algebra. Dotted arrows indicate the mapping between the two.

Query Plan (Left):

- flatten()**: A green rounded rectangle at the bottom left.
- column(1)**: A green rounded rectangle above **flatten()**.
- output()**: A green rounded rectangle above **column(1)**.
- cardinality(x1to1)**: A green rounded rectangle to the right of **flatten()**.
- load_table("patient",["id"]) SELECT id FROM patient**: A green rounded rectangle above **cardinality(x1to1)**.
- load_table("patient",["min","id"]) SELECT min FROM patient WHERE id = ?**: A green rounded rectangle above the first **load_table()**.
- head**: Yellow rounded rectangles at various points in the plan.
- 1**: Yellow rounded rectangles representing constants or single elements.
- flatten()**: A blue square with a plus sign at the bottom left.
- +**: A blue circle with a plus sign at the bottom left.
- +**: A blue circle with a plus sign above **output()**.

Typed Relational Algebra (Right):

- BlockOf x1to1**: A teal oval.
- EntityShape DATABASE**: A teal oval.
- TupleOf**: A teal oval.
- Int32**: A grey oval.
- String**: A grey oval.
- BlockOf x0toN**: A teal oval.
- EntityShape "patient"**: A teal oval.
- BlockOf x1to1**: A teal oval.
- BlockOf x0toN**: A teal oval.
- BlockOf x1to1**: A teal oval.
- BlockOf x0toN**: A teal oval.
- BlockOf x1to1**: A teal oval.
- BlockOf x0toN**: A teal oval.
- EntityShape "patient"**: A teal oval.
- TupleOf**: A teal oval.
- String**: A grey oval.
- BlockOf x1to1**: A teal oval.
- BlockOf x0toN**: A teal oval.
- EntityShape "patient"**: A teal oval.
- TupleOf**: A teal oval.
- String**: A grey oval.
- TupleOf**: A teal oval.
- String**: A grey oval.
- BlockOf x0toN**: A teal oval.
- String**: A grey oval.

Dotted arrows connect the query plan nodes to the typed relational algebra nodes, showing the mapping of the query plan to the typed relational algebra.













