Types of streams

Materialized: Operator 🡪 Table(GP)

Pipeline: Operator 🡪 Operator, Operator 🡪 Table(P)

Delta stream (c1, c2)

Raw stream (k1,c1,c2)

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | put | (k1,**null**🡪x1,  **null**🡪15) |
| 2 | put | (k2,  **null** 🡪x2, **null**🡪8) |
| 3 | put | (k2, x2🡪x1, 8🡪8) |
| 4 | put | (k1, x1🡪x1, 15🡪10) |
| 5 | put | (k2, x1🡪**null**, 8🡪**null**) |
| 6 | put | (k3,**null**🡪x1,  **null**🡪28) |
| 7 | put | (k3, x1🡪**null**, 28🡪**null**) |
| 8 | put | (k1, x1🡪x3, 10🡪22) |

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | put | (k1, x1, 15) |
| 2 | put | (k2, x2, 8) |
| 3 | put | (k2, x1, 8) |
| 4 | put | (k1, x1, 10) |
| 5 | delete | (k2) |
| 6 | put | (k3, x1, 28) |
| 7 | delete | (k3) |
| 8 | put | (k1, x3, 22) |

A

V2

(c1,c2)

c2 < 5

V1

A

c2 < 5

Preaggregated stream (c1, c2)

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | put | (x1,(k1,15)) |
| 2 | put | (x2,(k2,8)) |
| 3 | put | (x2, (k2,**null**)) |
|  | put | (x1,(k1,15),(k2,8)) |
| 4 | put | (x1,(k1,10),(k2,8)) |
| 5 | put | (x1,(k1,10),(k2,**null**)) |
| 6 | put | (x1,(k1,10),(k3,28)) |
| 7 | put | (x1,(k1,10)) |
| 8 | put | (k1, (x1,10), (x3,22)) |

c1, PKA, c2

P

V3

Join stream (c1, c2)

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | put | (x1,(k1,15)||(m1,4)) |
| 2 | put | (x1,(k1,15)||(m2,7)) |
| 3 | put | (x1, (k2,8)||(m1,4),(m2,7)) |
| 4 | put | (x2,(k5,12)) |
| 5 | put | (x2,(k5,10)||(m6,3)) |
| 6 | put | (x1, (k2,**null**)||(m1,4),(m2,7)) |
| 7 | put | (x1, (k1,15)|||(m1,4),(m2,**null**)) |
| 8 | put | (x2,(k5,10)||(m6,3),(m7,14)) |

R1

J1