2T JOIN (equal join-keys)

J1

Update propagation:

J1-1PKAPKBPKC, JKAB, JKBC (R1)

A B

R1JK, CONCAT(PKA), CONCAT(PKB) (A, B)

A B

C

A

2T JOIN Tables(equal join-keys)

|  |  |
| --- | --- |
| PK | col1 |
| k1\_m3\_l1 | x1 |
| k5\_m3\_l1 | x1 |
| k3\_m1\_l3 | x2 |
| k3\_m2\_l3 | x2 |
| k2\_m5\_l2 | x3 |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col2 |
| x1 | k1,k5 | m3 |
| x2 | k3 | m1,m2 |
| x3 | k2 | m5 |
| x4 |  | m4 |
| x5 | k4 |  |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col3 |
| k1 | x1 | 5 |
| k2 | x3 | 12 |
| k3 | x2 | 7 |
| k4 | x5 | 8 |
| k5 | x1 | 2 |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col3 |
| m1 | x2 | 5 |
| m2 | x2 | 12 |
| m3 | x1 | 7 |
| m4 | x4 | 8 |
| m5 | x3 | 2 |

2T JOIN Streams(equal join-keys)

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | get | (x1) |
|  | put | (x1,(k1)) |
| 2 | get | (x1) |
|  | put | (x1, (k1),(m1)) |
| 3 | get | (x2) |
|  | put | (x2,(k2)) |
| 4 | get | (x1) |
|  | put | (x1,(k1),(m2)) |
| 5 | get | (x1) |
|  | put | (x1,10**)** |
| 6 | get | (x1) |
|  | put | (x1,38) |
| 7 | get | (x1) |
|  | put | (x1,10**)** |
| 8 | get | (x1) |
|  | delete | (x1) |

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 1 | put | (k1,(**null**, **null)**, (x1,15)) |
| 3 | put | (k2,(**null**,**null)**,(x2,8)) |
| 6 | put | (k3,(x2,8), (x1,8)) |
| 8 | put | (k3, (x1,15), (**null**,**null**)) |

|  |  |  |
| --- | --- | --- |
| Seq | Op | Tuples |
| 2 | put | (m1,(**null**, **null)**, (x1,5)) |
| 4 | put | (m2,(**null**,**null)**,(x1,8)) |
| 5 | put | (m1,(x2,8), (**null**,**null**)) |
| 7 | put | (m4, (x1,15), (x1,10)) |

3T JOIN (equal join-keys)

J1

Update propagation:

J1-1PKAPKBPKC, JKAB, JKBC (R1)

A B C

R1

R1JK, CONCAT(PKA), CONCAT(PKB) CONCAT(PKC) (A,B,C)

A B C

A

C

B

3T JOIN(equal join-keys)- Tables

|  |  |
| --- | --- |
| PK | col1 |
| k1\_m3\_l1 | x1 |
| k5\_m3\_l1 | x1 |
| k3\_m1\_l3 | x2 |
| k3\_m2\_l3 | x2 |
| k2\_m5\_l2 | x3 |

|  |  |  |  |
| --- | --- | --- | --- |
| PK | col1 | col2 | col3 |
| x1 | k1,k5 | m3 | l1 |
| x2 | k3 | m1,m2 | l3 |
| x3 | k2 | m5 | l2 |
| x4 |  | m4 |  |
| x5 | k4 |  |  |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col3 |
| m1 | x2 | 5 |
| m2 | x2 | 12 |
| m3 | x1 | 7 |
| m4 | x4 | 8 |
| m5 | x3 | 2 |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col3 |
| k1 | x1 | 5 |
| k2 | x3 | 12 |
| k3 | x2 | 7 |
| k4 | x5 | 8 |
| k5 | x1 | 2 |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col3 |
| l1 | x1 | 5 |
| l2 | x3 | 12 |
| l3 | x2 | 7 |

3T JOIN(different join-keys)- Calculation

J1

J1-1PKAPKBPKC, JKAB, JKBC (R2)

(A B) C

R2

R2JKBC, CONCAT(JKAB), CONCAT(PKC) (R1,C)

(A B) C

R1

B

A

R1JKAB, CONCAT(PKA), CONCAT(PKB) (A,B)   
 A B

C

3T JOIN(different join-keys)- Tables

|  |  |  |
| --- | --- | --- |
| PK | col1 | col2 |
| k1 | x1 | 5 |
| k2 | x1 | 12 |
| k3 | x3 | 7 |
| k4 | x2 | 8 |
| k5 | x5 | 2 |
| k6 | x1 | 13 |

|  |  |  |  |
| --- | --- | --- | --- |
| PK | col1 | col2 | col3 |
| m1 | x1 | y1 | 5 |
| m2 | x3 | y2 | 12 |
| m3 | x2 | y3 | 7 |
| m4 | x5 | y4 | 8 |
| m5 | x1 | y2 | 2 |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col2 |
| k1\_m1\_l1 | x1 | y1 |
| k2\_m1\_l1 | x1 | y1 |
| k6\_m1\_l1 | x1 | y1 |
| k1\_m5\_l2 | x1 | y2 |
| k2\_m5\_l2 | x1 | y2 |
| k6\_m5\_l2 | x1 | y2 |
| k3\_m2\_l2 | x3 | y2 |

|  |  |  |
| --- | --- | --- |
| PK | col1 |  |
| y1 | x1(k1,k2,k6,m1) | l1 |
| y2 | x1(k1,k2,k6,m5),x3(k3,m2) | l2 |
| y3 | x1(k4,m3) |  |
| y4 | x1(k5,m4) |  |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col2 |
| x1 | k1,k2,k6 | y1(m1),y2(m5) |
| x2 | k4 | y3(m3) |
| x3 | k3 | y2(m2) |
| x5 | k5 | y4(m4) |

|  |  |  |
| --- | --- | --- |
| PK | col1 | col2 |
| l1 | y1 | 5 |
| l2 | y2 | 12 |

3T JOIN (different join-keys) - Flow diagram

J1

R2

A

B

R1

200P

200

250GP

(A B) C [MP=0,8]

150

100

200GP

A B [MP=0,75]

C

100GP

100GP

100GP

100F

100F

100F