CSC343 Worksheet 4 Solution

June 17, 2020

1. a) $[(1,0,1),(5,4,9),(1,0,1),(6,4,16),(7,9,16)]$

   b) $[(1,0),(3,3),(3,4),(4,3),(1,1),(4,3)]$

   c) $[(0,1),(0,1),(2,3),(2,4),(3,4)]$

   Notes:

   - $\tau_L(R)$ sorts tuples in order indicated by L.
     - e.g.

       $\tau_{C,B}(R)$ in $R(A,B,C)$ orders the tuples of R by their values of C, and tuples with the same C-value are ordered by their B value.

   d) $[(0,1),(0,2),(2,4),(2,5),(3,4),(3,4)]$

   e) $[(0,1),(2,4),(2,5),(3,4),(0,2)]$

   Notes:

   - $\delta(R)$ converts a bag into a set
     - e.g.

       Let $R = [(1,2),(3,4),(1,2),(1,2)]$

       $\delta(R(A,B)) = [(1,2),(3,4)]$

   f) $[(0,2),(2,7),(3,4)]$

   Notes:

   - $\gamma_L(R)$ is an operator that groups a relation and/or aggregate some columns.
     - L in $\gamma_L(R)$ is either
       1. **Grouping attribute** or an attribute by which R will be grouped.

2. **Aggregated attribute** or an attribute where an aggregation operator is applied to.

Example:

$\gamma_{starName,MIN(year)\rightarrow minYear,COUNT(title)\rightarrow ctTitle}(\text{StarsIn})$

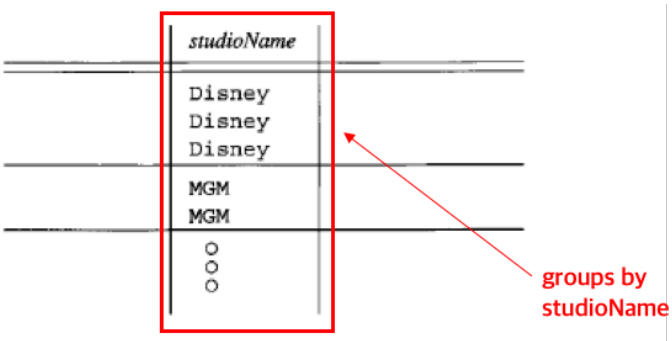

Figure 5.4: A relation with imaginary division into groups

g) $[(0, 1.5), (2, 4.5), (3, 4)]$