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INF 551 – Spring 2016

Quiz 5: OLAP and Indexing (10 points)

10 minutes

Consider the fact table Sales and its two dimension tables Product and Store shown below.

ProdID	StoreID	TimeID	Quantity
p1	s1	t1	5
p2	s2	t1	3
p3	s1	t1	4
p1	s2	t2	2
p3	s1	t2	8
p2	s1	t3	2

Sales

ProdID	Name	Category
p1	iphone 6	cell
p2	nexus 4	cell
p3	t460	laptop

Product

StoreID	City	State
s1	LA	CA
s2	NY	NY

Store

1. [4 points] Give the bit-vectors in the bitmap join indexes for Category and State (i.e., two indexes, both for joining with Sales).
   Answer:

Category		State	
cell	laptop	CA	NY
110101	001010	101011	010100

2. [2 points] What is the run-length encoding of the bit-vector for "cell" in the Category index?

   Answer:
   1 1 01 01
   =>00 00 01 01

3. [4 points] Give a SQL query to find "total sales quantity of cell phones in CA, broken down by time IDs". Describe how to utilize the indices to efficiently answer the query.

   Answer:

   SELECT TimeID, SUM(Quantity) From Sales, Product, Store

   WHERE Sales.ProdID=Product.ProdID

   AND Sales.StoreID=Store.StoreID

   AND State in 'CA'

   AND Category in 'cell'

   GROUP BY Sales.TimeID

   Look up join index on Sate for 'CA'.

   Look up join index on Category for 'cell' AND bit vector with result above.

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Turn vector into rids of sales, find records of sales.

Group records by Time.ID, compute sum for each group.

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