Data-Warehouse-Technologien
Exercise 12

1. Explain the phases of query processing done by relational database management systems.

2. Discuss the approach of common DBMS query optimizers. Are the approaches suitable for data warehouses?
   (a) A data warehouse schema is given that associates one fact (Sales) to 3 dimensions (Time, Location, Product). Furthermore, the following meta-data are given:
   - 50,000,000 tuples in the fact table.
   - The time dimension contains 10 years (20 days per month).
   - There are 50 product groups, each having 20 products.
   - There are 50 locations with 100 car-sellers each.
   Assume that the sales data is uniformly distributed over all dimensions. Which execution plans do we get by applying common database optimization strategies for the query in figure 1?
   (b) Discuss optimization strategies for Star Joins.
   (c) Which optimal execution plan do standard query optimizers leave out?

3. Explain optimization strategies for GROUP BY operations.

4. Write down the aggregation grid for the dimensions Product, Region, Day and Sales.

```
SELECT Revenue
FROM Sales, Location, TTime, Product
WHERE Product.id = Verkaeufe.Product.id AND
     Product.Productgroup = 'W' AND
     Location.id = Sales.shop_id AND
     Location.Region = 'Magdeburg' AND
     TTime.id = Sales.day_id AND
     TTime.Year = '2004' OR
     TTime.Year = '2005' OR
     TTime.Year = '2006' AND
     TTime.Month = '12';
```

Abbildung 1: DWH-Query.