Advanced Topics in Databases
Exercise 4

1. Describe the two different storage models presented in the lecture. Especially, consider the following aspects:
   (a) Usability for OLTP/OLAP
   (b) Compression techniques
   (c) Query execution

2. Why is lightweight data compression so important, especially for main-memory DBMSs? Explain the basic principle of dictionary encoding? Use a self-chosen example. Explain how dictionary encoded data can be processed without decompressing it!

3. Explain and compare different materialization strategies for column-stores. What are their advantages?

4. What alternative design consideration can be made when designing a main-memory DBMS for OLTP? Why? What are the benefits?

5. Explain the delta store concept? What is the basic idea? Why can it be used to efficiently support mixed OLTP/OLAP workloads?

Good Luck!