# Practical 6.2 – Performance Tuning 1: Physical Design

1. Is it possible to have two primary indices on the same table for different search keys? Explain.
2. Since a query is often faster if there is in an index on the search or join fields, why not just keep indices on every column of every table? Provide at least three reasons.
3. Describe a feature of a data processing situation that would make you reluctant to use any indexes at all.
4. Your client performs many select operations on large record sets; updates, inserts and deletes are comparatively rare. He wants to make the single hardware modification that will most improve his query response times. What do you suggest?
5. Consider a delete operation which uses an equality comparison (e.g. DELETE FROM tblData WHERE first\_name = ‘Bob’) where no record qualifies (i.e. there is no record with first\_name = Bob). Describe the work that must be performed for each of the three main file organisations – heap, sequential and hashed. Which is the most efficient? Which is the least efficient?
6. What sorts of queries gain the greatest benefit from being able to use a clustered index?
7. Assume that you have a table with two “candidate keys”, that is, two different columns that are unique for each record and which could, therefore, each serve as the primary key. When deciding which to use, what is the most important question to ask about *the pattern of queries exercised against this database?*
8. Recall these tables from the ‘pubs’ database:

publishers(pub\_id, pub\_name, city, state, country)

titles(title\_id, title, type, pub\_id\*, price, advance, royalty,ytd\_sales, notes, pub\_date)

* 1. Assume that a user of this database performs frequent queries on a book’s title or title\_id selecting fields that include the publisher’s name. Assume further that the user feels these queries run too slowly. Describe at least four different actions you could take to improve the response time of these queries:
  2. What if your client frequently wants to know the number of different books published by each publisher. What action might you take to speed up this query? Is there any potential problem associated with this action?