Problem 1:

1. Can we build 2 primary indexes?

For just one table we can’t have 2 primary indexes. Because primary indexes are built with the key of the table, therefore, for each table, it can only have one unique primary index.

1. Can we build two clustering indexes on a file? Why?

For each table, there can only be one clustering index. Because there’s only one order of the stored data, therefore all clustering indexes on the same file will be essentially identical. When we try to build a second clustering index on the same table, it will have to re-sort based on the attribute.

1. Can we build two secondary indexes on a file? Why?

Yes. Secondary indexes are not sorted and are not based on the key attribute. Thus we can have multiple secondary indexes on a file on different attributes.

Problem 2:

1: Without indexing

A diagram of a table

Description automatically generated

2: With indexing

A diagram of a computer program

Description automatically generated

3:

The query cost of with indexing is much lower than without indexing, especially when there are so many rows to start, and you are selecting only 1 row that satisfies the requirement.

4:

A diagram of a table scan

Description automatically generated(48.07k rows)

5:

A diagram of a table

Description automatically generated

6:

With indexing on the strings, it changed from executing a full table scan to only an index range scan. It reduced the rows from 48.07k rows to only 10 rows.