Imani Leary

Software Development, ECPI University

CIS223: Introduction to Databases

Professor Charles F.

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**Problem 1**

The file contains a total of 7 records, and there are 5 fields per record.

The problem I would encounter when producing a listing by city is that the city field is not seperate. It is combined with the address field as well. To fix this issue, the file structure can be altered by separating the city field from the address field and making it its own field.

To produce a listing of the file contents by last name, area code, city, state, or zip code, the file structure can be altered by adding separate fields for last name, area code, city, state, and zip code.

The data redundancies detected are:

* Repetitive manager's name (Holly B. Parker, Jane D. Grant, George F. Doris) and the contact information (the phone number and address) in multiple records.
* Repetitive project bid price for the same manager (Holly B. Parker) and address (3334 Rodan Rd.) in two records.

These redundancies can lead to anomalies such as data inconsistency, update anomalies (for example, changing the manager’s name or contact information in one record but not in others), and insertion anomalies (if a new project bid is added for a manager without having to repeat the manager’s name and contact information).

**Problem 2**

The redundancies in this problem are the class codes, class names, credit hours, instructor name, and the class days. Due to this, anomalies would be caused, without a doubt. There are only two sections (student ID and student names) that are not repetitive.