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CIS 310-01

Assignment 1

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1. How many records does the file contain? How many fields are there per record?
   a. The file contains **7 records** (21-5Z, 25-2D, 25-5A, 25-9T, 27-4Q, 29-2D, and 31-7P) and each record is composed of **5 fields** (PROJECT_CODE, PROJECT_MANAGER, MANAGER_PHONE, MANAGER_ADDRESS, and PROJECT_BID_PRICE)

2. What problem would you encounter if you wanted to produce a listing by city? How would you solve this problem by altering the file structure?
   a. Because the city names are contained within the MANAGER_ADDRESS attribute, producing a listing by city would be hard to manage due to the fact that you'd be conducting an internal string search which makes queries much more difficult to write.
   b. To solve this problem, you would need to alter the file structure by adding another attribute that stores just the city name.

3. If you wanted to produce a listing of the file contents by last name, area code, city, state, or zip code, how would you alter the file structure?
   a. For last name, we would need to divide PROJECT_MANAGER into components such as MANAGER_FIRSTNAME, MANAGER_MIDDLEINITIAL, and MANAGER_LASTNAME. For area code, we would need to divide MANAGER_PHONE into components such as MANAGER_AREACODE and MANAGER_PHONE. For city, state, and/or zip code, we would need to divide MANAGER_ADDRESS into components such as MANAGER_STREET, MANAGER_CITY, MANAGER_STATE, and MANAGER_ZIP. This way we are able to easily search and select records based on those specific file contents.

4. List the major sources of data redundancy. Use one of the identified sources of data redundancies and provide an example of update anomaly using your sample data.
   a. The name Holly B. Parker in the PROJECT_MANAGER field occurs 3 times and George F. Dort appears twice, along with their phone and address information. This indicates that they manage a few other projects, meaning they have one-to-many relationships between PROJECT and MANAGER, where each project belongs to one and only one manager and each manager may have one or more projects.
   b. Update Anomaly: If manager Holly B. Parker has a new phone number, it must be entered in each of the MANAGER file records in which her phone number is shown. In this case, these changes must be made more than once and must be made correctly. In a large file system, such a change might occur in hundreds or thousands of records.