You are asked to implement a software system on Linux based computing platforms to maintain a large set of data records and generate reports. The system needs to handle tens of millions of records. Thousands of new records may be added to the system in a day. This system needs to automatically generate data transaction statistics once every day and produce user-readable reports (on-screen and printed) based on user queries. Each record has data with characteristics summarized in the table below:

Data	Type	Size	Unique
ID	Alphanumeric	16 characters	Yes
Name	Characters	Maximum 150 characters	No
Phone	Numeric	15 digits	No
Address	Alphanumeric	Maximum 500 characters	No
Timestamp	Date + Time	8 bytes	No

Please answer the following questions and privately share your solution in a *gitlab.com* account:

1. Create a private subgroup on *gitlab.com* and add user *avididsys* as a developer. Check in your answers to the following questions in the same project.

2. Select the appropriate database system, programming/scripting languages, and data report formats to implement this system. Provide a brief explanation for each choice and save it in a document format of your choice.

3. Create 3 to 10 records of test data to provide a good representation of the ID and timestamp ranges. Your data does not need to provide full test coverage but they should include the following:
   (a) 3 records with an ID that start with the character ‘A’ and a timestamp on November 6, 2018.
   (b) At least 2 records have different dates
   (c) At least one address is in Norco, CA

   Save the test records in a text file using a format of your choice. Also, provide a brief description of the coverage provided by each test record.

4. Use a programming language you selected for Question 2, write a function or class to generate a two-column table that shows the record count of the IDs that start with the character ‘A’ in each of the 24 hours in an arbitrary day. This table will have 24 rows of data. The first column of the table is the hour number in a 24-hour clock and the second column of the table is the number of records with a timestamp within the corresponding hour.

   Using this function or class to generate a table for November 6, 2018 using the data you selected for Question 3. Select an output format that is appropriate for on-screen display.

5. Use a programming language you selected for Question 2, write a function to identify the city within an address. Assume that all addresses have a valid city name and your system has unlimited access to a database with all the valid city names.

   Create a list of unique cities from the data you selected for Question 3. Arrange the cities in alphabetical order.