Navarurh Kumar 1

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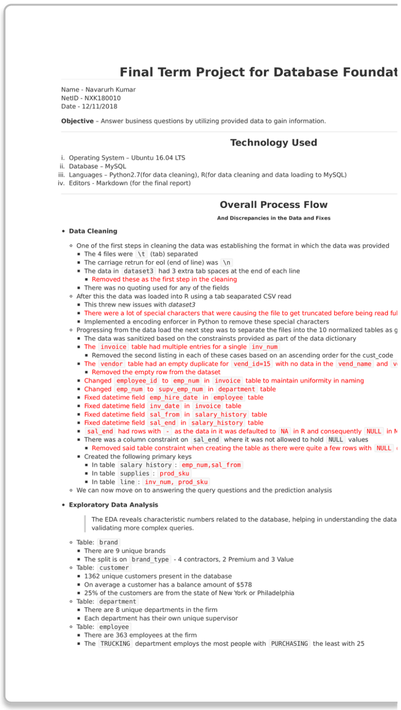

Final Term Project for Database Foundat

Name - Navarurh Kumar
NetID - NXK180010
Date - 12/11/2018

Objective – Answer business questions by utilizing provided data to gain information.

Technology Used

i. Operating System – Ubuntu 16.04 LTS
ii. Database – MySQL
iii. Languages – Python2.7(for data cleaning), R(for data cleaning and data loading to MySQL)
iv. Editors - Markdown (for the final report)

Overall Process Flow

And Discrepancies in the Data and Fixes

- **Data Cleaning**
  - One of the first steps in cleaning the data was establishing the format in which the data was provided
    - The 4 files were `\t` (tab) separated
    - The carriage retrun for eol (end of line) was `\n`
    - The data in `dataset3` had 3 extra tab spaces at the end of each line
      - Removed these as the first step in the cleaning
    - There was no quoting used for any of the fields
  - After this the data was loaded into R using a tab seaparated CSV read
    - This threw new issues with *dataset3*
    - There were a lot of special characters that were causing the file to get truncated before being read ful
    - Implemented a encoding enforcer in Python to remove these special characters
  - Progressing from the data load the next step was to separate the files into the 10 normalized tables as g
    - The data was sanitized based on the constrainsts provided as part of the data dictionary
    - The `invoice` table had multiple entries for a single `inv_num`
      - Removed the second listing in each of these cases based on an ascending order for the cust_code
    - The `vendor` table had an empty duplicate for `vend_id=15` with no data in the `vend_name` and `v
      - Removed the empty row from the dataset
    - Changed `employee_id` to `emp_num` in `invoice` table to maintain uniformity in naming
    - Changed `emp_num` to `supv_emp_num` in `department` table
    - Fixed datetime field `emp_hire_date` in `employee` table
    - Fixed datetime field `inv_date` in `invoice` table
    - Fixed datetime field `sal_from` in `salary_history` table
    - Fixed datetime field `sal_end` in `salary_history` table
    - `sal_end` had rows with `-` as the data in it was defaulted to `NA` in R and consequently `NULL` in M
    - There was a column constraint on `sal_end` where it was not allowed to hold `NULL` values
      - Removed said table constraint when creating the table as there were quite a few rows with `NULL`
    - Created the following primary keys
      - In table `salary history` : `emp_num,sal_from`
      - In table `supplies` : `prod_sku`
      - In table `line` : `inv_num, prod_sku`
  - We can now move on to answering the query questions and the prediction analysis
- **Exploratory Data Analysis**

  > The EDA reveals characteristic numbers related to the database, helping in understanding the data
  > validating more complex queries.

  - Table: `brand`
    - There are 9 unique brands
    - The split is on `brand_type` - 4 contractors, 2 Premium and 3 Value
  - Table: `customer`
    - 1362 unique customers present in the database
    - On average a customer has a balance amount of $578
    - 25% of the customers are from the state of New York or Philadelphia
  - Table: `department`
    - There are 8 unique departments in the firm
    - Each department has their own unique supervisor
  - Table: `employee`
    - There are 363 employees at the firm
    - The `TRUCKING` department employs the most people with `PURCHASING` the least with 25

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