Solving the SQL murder Mystery

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Course

Date

**Introduction**

Investigative activities more often than not, require the establishment of the relationship activities among objects and activities. For instance with regression and correlation, an analyst id able to establish a pattern along the moving the data items.

The relationship among the items could be positive or negative. Positive relation which is always indicated as a variable almost equal to 1, also measured as percentage. For instance, positive relation of 0.6 cold also be represented as 60% which is the probability of the event happening. Negative relationships are represented by – values. This is how far the object in activity is far from the actual reference which in this case takes a value of 1. Negative correlation shall indicate how far the next event is far from not happening or falling into activity.

Data modelling is another term that is used to refer to the process of writing algorithms that could solve the problem at hand. The model takes the input, based on the A/B testing rule, the data is split into both training and test data. Usually the test data takes 80% of the input and the test data takes 20%, the reason why the training data is higher is because we want our model to learn as much as possible from our dataset and then be able to implement a pattern from it based on the inputs it received. Eventually, when we finally run the algorithm on the data, it is much easier to run outcomes. Finally, the model is able it run the algorithm and able to apply predictive analytics on the dataset as we shall see later in the unit or topic.

**Problem statement**

In this particular problem, we have been presented with a scenario of solving a murder mystery. The security department analysts would like to catch up with the suspect who has committed this particular crime. To solve this problem using SQL, we must treat this problem as a series of interacted activities. Pause for a minutes and let’s create the scenario story:

**Case scenario**

It is a Friday afternoon and Mrs. Greene Peet is at her home chilling by the fire as she listens to her favorite TV program. Her gardener, Mr. Scotch is in his servant house outside but within the same compound of the he shares with Mrs., Greene. Earlier in the day, Mr. Scotch had had a conversation with his employer who had told him about his 4 four sons who work in New York city and Australia respectively, the sons were planning of visiting their mother this year in December for a family re-union in New Orleans. During their conversation and discussion, Mr. Scotch had also realized that Mrs. Greene owns a whole treasure box full of jewelry that her husband how used to work as a Marine Geologist left her before his passing. The treasure box is kept in Mrs. Greene bedroom safe box.

Within the neighborhood, Mr. Scotch has been seen quite a couple of time interacting with few people how have been on ten radar of the local police detective, most of which are drug lords and petty crime offenders, a few times been in and out of custody. Earlier before the murder day, Mr. Scotch had booked a ship ticket to Norway and also made a Facebook post that stated, “Home is where the heart is”.

Apart from cleaning and running normal errands for Mrs. Greene, Mr. Scotch also prepares meals and passes medications for his employer who suffers from Diabetes. Thought it had come so casually, Scotch informed his employer’s eldest son that he would be travelling to see his family in Norway the following days. That evening, he just served the meals, passed the medications and went to bed as usual. The following day, he woke up and travelled, just as he had mentioned. However, trouble began when two days after his departure, the neighbors noticed unusual silence coming from a house that is used to activity and liveliness. When one of the neighbors when ahead and knocked on the door, and there want a response, they called for help and had to force themselves in. In this process of tussle and hassle, they found Mrs. Greene lifeless body on the bathroom floor, as if aim as situation where she was chocking. When the medics came in, the doctor’s report revealed that Mrs. Green had actually been poisoned, but they didn’t know by who.

**Analysis**

The data analysis is presented with this case to establish the pieces of interacted missing information from this case. With a data driven mind, the first step is to conduct the related data enquiries that are mentioned in this case. These hall help the detectives to understand how best to solve this case.

Persons:

|  |  |  |
| --- | --- | --- |
| Person\_id | Person\_name | nationality |
|  |  |  |

Detective

|  |  |  |  |
| --- | --- | --- | --- |
| Detective\_id | Detective\_name | Detective\_location | Is\_active |
|  |  |  |  |
|  |  |  |  |

Crime table

|  |  |  |  |
| --- | --- | --- | --- |
| Crime\_id | Crime\_location | Crime\_timestamp | Crime\_status |
|  |  |  |  |

Facebook table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Post\_id | Posted\_by | Post\_timestamp | Post\_location | Post\_status |
|  |  |  |  |  |

Items table

|  |  |  |  |
| --- | --- | --- | --- |
| Item\_id | Item\_name | Item\_type | Is\_relational |
|  |  |  |  |

Booking table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Booking\_id | Booking\_name | Ticket\_id | Booking\_date | destination |
|  |  |  |  |  |

Bio table

|  |  |  |  |
| --- | --- | --- | --- |
| Person\_id | Fingerprint\_id | Is\_march | Crime\_id |
|  |  |  |  |

Purchase tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Person\_id | Purchase\_id | Purchase\_item | Purchase\_location | Purchase\_date |
|  |  |  |  |  |

Based on the above tables, we can then proceed to now write the exact SQL queries for creating the tables as below:

--TABLE PERSONS

CREATE TABLE PERSONS

(

PERSON\_ID VARCHAR(255) NOT NULL,

PERSON\_NAME VARCHAR(255),

NATIONALITY VARCHAR,

PRIMARY KEY(PERSON\_ID)

);

--DETECTIVE TABLES

CREATE TABLE DETECTIVES

(

DETECTIVE\_ID INT NOT NULL,

DETECTIVE\_NAME VARCHAR(255),

DETECTIVE\_LOCATION VARCHAR(255),

IS\_ACTIVE VARCHAR(255),

PRIMARY KEY (DETECTIVE\_ID)

)

--CRIME TABLES

CREATE TABLE CRIMES

(CRIME\_ID INT NOT NULL,

CRIME\_LOCATION VARCHAR(255),

CRIME\_TIMESTAMP DATETIME,

CRIME\_STATUS VARCHAR(255),

PRIMARY KEY (CRIME\_ID)

)

--FACEBOOK POSTS  ID

CREATE TABLE  FACEBOOK\_POSTS

(

POST\_ID INT NOT NULL,

POSTED\_BY VARCHAR(255),

POST\_TIMESTAMP TIMESTAMP,

POST\_LOCATION VARCHAR(255),

POST\_STATUS VARCHAR(255),

PRIMARY KEY (POST\_ID)

)

--CREATE ITEMS

CREATE TABLE ITEMS

(

ITEM\_ID INT NOT NULL,

ITEM\_NAME VARCHAR(255),

ITEM\_TYPE VARCHAR(255),

IS\_RELATIONAL VARCHAR(25),

PRIMARY KEY(ITEM\_ID)

)

--BOOKING TABLE

CREATE TABLE BOOKINGS

(

BOOKING\_ID INT NOT NULL,

BOOKING\_NAME VARCHAR(255),

TICKET\_ID VARCHAR(255),

BOOKING\_DATE DATE,

DESTINATION VARCHAR(255),

PRIMARY KEY (BOOKING\_ID)

)

--BIO TABLE

CREATE TABLE  BIO

(

PERSON\_ID INT NOT NULL,

FINGERPRINT\_ID VARCHAR(255),

IS\_MARCH VARCHAR(255),

IS\_MARCH VARCHAR(255),

CRIME\_ID INT,

PRIMARY KEY (PERSON\_ID)

)

--PURCHASE TABLES

CREATE TABLE PURCHASES

(PURCHASE\_ID VARCHAR(255),

PURCHASE\_ITEM VARCHAR(255),

PURCHASE\_STORE VARCHAR(255),

PURCHASE\_LOCATION VARCHAR(255),

PURCHASE\_DATE DATE,

PRIMARY KEY (PURCHASE\_ID)

)

After the murder incident, a lot of questions arose and some of the questions that could be answered by the analyst include the following:

1. Get a history of all crimes that have happened before:

SELECT \* FROM CRIMES

1. Get all the suspected who have ever engaged in a crime together with their crimes

SELECT a.\*, b.\* FROM CRIMES a

LEFT OUTER JOIN PERSONS b

ON a.PERSON\_ID = b.PERSON\_ID

1. Get all crime locations that have happened lately in the last one month

--LATEST CRIMES

SELECT \* FROM CRIMES WHERE CRIME\_TIMESTAMP >= '2022-02-22'

1. Get all latest crimes within this reported locality

SELECT \* FROM CRIMES WHERE CRIME\_TIMESTAMP >= '2022-02-22'

AND CRIME\_LOCATION = 'ORLEANS'

1. Associate the fingerprints with those found on the ship ticket and the missing jewelry box

SELECT a.\*, b.\*,c.FINGERPRINT\_ID FROM CRIMES a

LEFT OUTER JOIN PERSONS b

ON a.PERSON\_ID = b.PERSON\_ID

LEFT OUTER JOIN BIO

ON b.PERSON\_ID = c.PERSON\_ID