**Logical Data Modeling and Attributes**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attributes** | **Description** | **Entity** | **Data Type** |
| **TransactionID** | **The unique identifier for a transaction** | **Transactions** | **char(10)** |
| **AccountID** | **The unique identifier for an account** | **Account** | **char(10)** |
| **ClientID** | **The unique identifier for a client** | **Client** | **char(10)** |
| TransactionAmount | The value of the transaction |  | money |
| TransactionTime | The time the transaction was requested |  | rowversion |
| TransactionPosted | The time the transaction posts |  | datetimeoffset |
| TransactionType | Either withdrawal or deposit |  | bit |
| TransactionDescription | The description of the transaction |  | varchar(max) |
| **AccountID** | **The unique identifier for an account** | **Account** | **char(10)** |
| AccountOpenDate | The date the account was opened |  | smalldatetime |
| AccountCloseDate | The date the account was closed |  | smalldatetime |
| AccountType | The type of account |  | varchar(max) |
| AccountBalance | The current balance of the account |  | money |
| AccountRate | The APR or interest rate of the account |  | decimal(5,2) |
| **ClientID** | **The unique identifier for a client** | **Client** | **char(10)** |
| ClientSSN | Client’s social security number |  | decimal(9,0) |
| ClientFirstName | Client’s legal first name |  | vchar(15) |
| ClientSurname | Client’s surname |  | vchar(15) |
| ClientLastName | Clients legal last name |  | vchar(15) |
| ClientOpenDate | The date the client initiated service |  | smalldatetime |
| ClientCancelDate | The date the client canceled service |  | smalldatetime |
| ClientEmail | Preferred email for the client |  | varchar(max) |
| ClientPhone | Preferred phone number for the client |  | decimal(10,0) |
| ClientAddressStreet | The street of the client’s address |  | varchar(50) |
| ClientAddressCity | The city of the client’s address |  | varchar(15) |
| ClientAddressRegion | The state or region of the client’s addr. |  | varchar(15) |
| ClientAddressCountry | The country of the client’s addr. |  | varchar(15) |

**Normalization (see Visio diagram)**



# Test Data

Client

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ClientID | ClientSSN | ClientFirstName | ClientSurname | ClientLastName | ClientOpenDate | ClientCancelDate |
| 000000001C | 123456789 | John | null | Doe | 03/02/1993 13:23:14.364 | 07/19/2001 15:34:01.214 |
| 000000002C | 987654321 | Jane | Smith | Doe | 01/09/1987 10:43:56.545 | null |
| 000000003C | 123498765 | Miguel | Ortega | Perez | 10/23/2007 17:55:32.174 | null |
| 000000004C | 987651234 | Mona | null | Lisa | 08/02/1973 15:07:23.217 | null |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ClientEmail | ClientPhone | ClientAddressStreet | ClientAddressCity | ClientAddressRegion | ClientAddressCountry |
| johndoe@outlook.com | 2028274812 | 15 Harriet St fl 2 | Tarrytown | New York | USA |
| Null | 2129205892 | 129-23 maple st | Denver | Colorado | USA |
| ortega@gmail.com | 9145928279 | 1290 Cedar Oak St Unit 502 | Harrisberg | New Jersey | USA |
| paintings@yahoo.com | 6469201857 | 218 Rua de Meodas | Lisboa | null | Portugal |

Account

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| AccountID | AccountOpenDate | AccountCloseDate | AccountType | AccountBalance | AccountRate |
| 000000001A | 03/02/1993 13:23:39.235 | null | Checking | $2,983.45 | 1.00% |
| 000000002A | 01/09/1987 10:43:54.048 | null | Credit Card | ($3,509.94) | 19.99% |
| 000000003A | 10/23/2007 17:55:43.645 | null | CD | $32,754.34 | 2.50% |
| 000000004A | 08/02/1973 15:07:24.674 | 12/01/2015 0955 | Mortgage | ($243,956.34) | 6.00% |

Transactions

|  |  |  |  |
| --- | --- | --- | --- |
| TransactionID | AccountID | ClientID | TransactionAmount |
| 1234ABCDET | 000000001A | 000000001C | $296.23 |
| 000000001T | 000000002A | 000000002C | $75.34 |
| ABCDEF123T | 000000003A | 000000003C | $15.34 |
| A0B9C8D7ET | 000000004A | 000000004C | $3,593.34 |

|  |  |  |  |
| --- | --- | --- | --- |
| TransactionTime | TransactionPosted | TransactionType | TransactionDescription |
| 0x00A0000A070008D4 | 2016-01-14 10:29:09.032 | 0 | Withdrawal |
| 0x0200D504004001EF | 2015-11-28 16:49:12.984 | 0 | Interest Charged |
| 0x004001EF000002D3 | 2016-02-10 17:11:23.654 | 1 | Interest Accrued |
| 0x0A05050E0B0201C1 | 2016-02-01 08:32:10.156 | 1 | Deposit |

**Test Queries**

DROP TABLE Account

DROP TABLE Client

DROP TABLE Transactions

CREATE TABLE Transactions (TransactionID char(10) PRIMARY KEY, AccountID char(10), ClientID char(10), TransactionAmount money, TransactionTime rowversion, TransactionPosted datetimeoffset, TransactionType bit, TransactionDescription varchar(max));

CREATE TABLE Account (AccountID char(10) PRIMARY KEY, AccountOpenDate smalldatetime, AccountCloseDate smalldatetime, AccountType varchar(max), AccountBalance money, AccountRate decimal(5,2));

CREATE TABLE Client (ClientID char(10) PRIMARY KEY, ClientSSN decimal(9,0), ClientFirstName varchar(15), ClientSurname varchar(15), ClientLastName varchar(15), ClientOpenDate smalldatetime, ClientCancelDate smalldatetime, ClientEmail varchar(max), ClientPhone decimal(10,0), ClientAddressStreet varchar(50), ClientAddressCity varchar(15), ClientAddressRegion varchar(15), ClientAddressCountry varchar(15));

INSERT INTO Client VALUES ('000000001C', '123456789', 'John', null, 'Doe', '03/02/1993 13:23:14.364', '07/19/2001 15:34:01.214', 'johndoe@outlook.com', '2028274812', '15 Harriet St fl 2', 'Tarrytown', 'New York', 'USA');

INSERT INTO Client VALUES ('000000002C', '987654321', 'Jane', 'Smith', 'Doe', '01/09/1987 10:43:56.545', null, null, '2129205892', '129-23 maple st', 'Denver', 'Colorado', 'USA');

INSERT INTO Client VALUES ('000000003C', '123498765', 'Miguel', 'Ortega', 'Perez', '10/23/2007 17:55:32.174', null, 'ortega@gmail.com', '9145928279', '1290 Cedar Oak St Unit 502', 'Harrisberg', 'New Jersey', 'USA');

INSERT INTO Client VALUES ('000000004C', '987651234', 'Mona', null, 'Lisa', '08/02/1973 15:07:23.217', null, 'paintings@yahoo.com', '6469201857', '218 Rua de Meodas', 'Lisboa', null, 'Portugal');

INSERT INTO Account VALUES ('000000001A', '03/02/1993 13:23:39.235', null, 'Checking', '2983.45', '1.00');

INSERT INTO Account VALUES ('000000002A', '01/09/1987 10:43:54.048', null, 'Credit Card', '3509.94', '19.99');

INSERT INTO Account VALUES ('000000003A', '10/23/2007 17:55:43.645', null, 'CD', '32754.34', '2.50');

INSERT INTO Account VALUES ('000000004A', '08/02/1973 15:07:24.674', '12/01/2015 09:55:21.874', 'Mortgage', '243956.34', '6.00');

INSERT INTO Transactions VALUES ('1234ABCDET', '000000001A', '000000001C', '296.23', DEFAULT, '2016-01-14 10:29:09.032', 0, 'Withdrawal');

INSERT INTO Transactions VALUES ('000000001T', '000000002A', '000000002C', '75.34', DEFAULT, '2015-11-28 16:49:12.984', 0, 'Interest Charged');

INSERT INTO Transactions VALUES ('ABCDEF123T', '000000003A', '000000003C', '15.34', DEFAULT, '2016-02-10 17:11:23.654', 1, 'Interest Accrued');

INSERT INTO Transactions VALUES ('A0B9C8D7ET', '000000004A', '000000004C', '3593.34', DEFAULT, '2016-02-01 08:32:10.156', 1, 'Deposit');

SELECT \* FROM Transactions

SELECT \* FROM Account

SELECT \* FROM Client

