**CURRENCy arbitrage trading**

**TEAM: SCATTERED BRAINS | 03/28/2020**

**CS 411: Database Systems**

**Term: Spring 2020**

**Project Information**

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| **Project Name** | **Currency Arbitrage Trading** |
| **Description** | Currency Arbitrage Trading explores the opportunity resulting from a pricing discrepancy among different currencies in the foreign exchange market.  The daily exchange rates from European Central Bank (ECB) is analyzed for any possible arbitrage trading opportunities between base & target currency and provides intermediate trading currency details for arbitrage trading. |
| **Team Name** | **SCATTERED BRAINS** |
| **Team Captain** | Melany Rosales |
| **Team Members** | Melany Rosales  Nihar Samal  Prem Kumar Manoharan |
| **Application Type** | Andriod Mobile Application |
| **Database Used** | SQLite Version 3 |
| **Application Development Platforms Used** | IDE: Visual Studio 2019 Community Edition (Free Version) - <https://visualstudio.microsoft.com/downloads/>  <Additional Platforms To Be Added> |
| **Database Platforms Used** | SQLite Studio (Embedded DB) 🡪 <https://sqlitestudio.pl/index.rvt>  MySQL (Hosted DB) 🡪 <https://www.mysql.com/> |
| **Features** | <Currency Arbitrage Trading -- Features & Special Functionalities To Be Added> |

**Tables & Schema definitons**

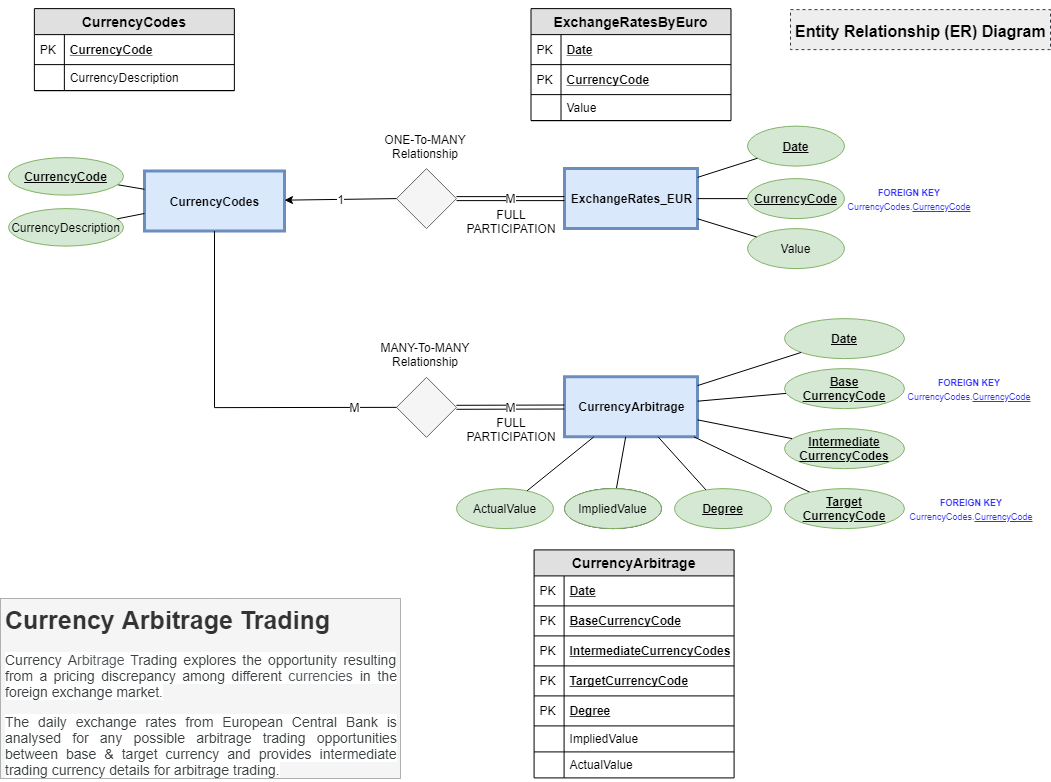
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| **Table Name** | **CurrencyCodes** |
| **Description** | The CurrencyCodes table stores the Currency Codes metadata with the description of every world currency along with their ISO 4217 Currency Code.  The CurrencyCode column value in this table is referred as Foreign Key by all the related tables in the application. |
| **Columns** | CurrencyCode (PRIMARY KEY)  CurrencyDescription |
| **SQLite Syntax** | CREATE TABLE IF NOT EXISTS CurrencyCodes (CurrencyCode TEXT NOT NULL, CurrencyDescription TEXT NOT NULL, PRIMARY KEY(CurrencyCode)); |
| **Data Source** | ISO 4217 Currency Codes Dataset 🡪 <https://www.xe.com/iso4217.php> |

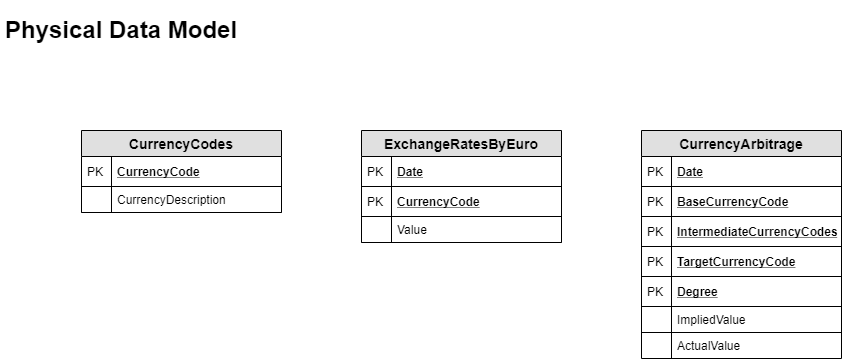
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| **Table Name** | **CurrencyExchangeRates** |
| **Description** | The CurrencyExchangeRates table stores Exchange Rates of target currency that is downloaded from ECB (European Central Bank) for any given date. |
| **Columns** | Date  BaseCurrencyCode  TargetCurrencyCode  ExchangeRate |
| **SQLite Syntax** | **Main ExchangeRate Table - Used For All ExchangeRate Calculations**  CREATE TABLE IF NOT EXISTS CurrencyExchangeRates (Date TEXT NOT NULL, BaseCurrencyCode TEXT NOT NULL, TargetCurrencyCode TEXT NOT NULL, ExchangeRate NUMERIC NOT NULL, FOREIGN KEY(TargetCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode), FOREIGN KEY(BaseCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode), PRIMARY KEY (Date,BaseCurrencyCode,TargetCurrencyCode));  **Archive Table - To Archive The Historical Records From Main Table**  CREATE TABLE IF NOT EXISTS CurrencyExchangeRatesArchive (Date TEXT NOT NULL, BaseCurrencyCode TEXT NOT NULL, TargetCurrencyCode TEXT NOT NULL, ExchangeRate NUMERIC NOT NULL, FOREIGN KEY(TargetCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode), FOREIGN KEY(BaseCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode), PRIMARY KEY (Date,BaseCurrencyCode,TargetCurrencyCode)); |
| **Data Source** | The CurrencyExchangeRates table is populated with one-time historical exchange rates data from European Central Bank (ECB), collected in excel format with base currency set to Euro (EUR).  Download Historical Exchange Rates to Excel 🡪 <https://excelrates.com/> |
| **Real-time Data Inserts** | The daily real-time data from European Central Bank (ECB) were collected via web feed in XML format and inserted in to the CurrencyExchangeRates table.  Daily Exchange Rates - from European Central Bank (ECB) - Base Currency Set To Euro (EUR) - <https://www.ecb.europa.eu/stats/eurofxref/eurofxref-daily.xml> |
| **WebAPI Endpoints** | <https://api.exchangeratesapi.io/history?start_at=BEGIN_DATE&end_at=END_DATE&base=ABC&symbols=XYZ>  <https://api.exchangeratesapi.io/latest?base=ABC>  <https://api.exchangeratesapi.io/latest?base=ABC&symbols=XYZ>  ABC = BaseCurrencyCode  XYZ = TargetCurrencyCode  BEGIN\_DATE = Begin Date To Fetch ExchangeRates From European Central Bank (ECB)  END\_DATE = End Date To Fetch ExchangeRates From European Central Bank (ECB) |

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| **Table Name** | **CurrencyArbitrageLog** |
| **Description** | The CurrencyArbitrageLog table stores the set of Currency Arbitrage calculations performed on the given date and enables the User for any possible opportunities in arbitrage trading. |
| **Columns** | Date  BaseCurrencyCode  IntermediateCurrencyCodes  TargetCurrencyCode  Degree  ImpliedValue  ActualValue |
| **SQLite Syntax** | CREATE TABLE IF NOT EXISTS CurrencyArbitrageLog (Date TEXT NOT NULL, BaseCurrencyCode TEXT NOT NULL, IntermediateCurrencyCodes TEXT NOT NULL, TargetCurrencyCode TEXT NOT NULL, Degree INTEGER NOT NULL, ImpliedValue NUMERIC NOT NULL, ActualValue NUMERIC NOT NULL, PRIMARY KEY (Date,BaseCurrencyCode,IntermediateCurrencyCodes,TargetCurrencyCode,Degree), FOREIGN KEY(TargetCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode), FOREIGN KEY (BaseCurrencyCode) REFERENCES CurrencyCodes(CurrencyCode)); |

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| **Table Name** | **DataRefreshLog** |
| **Description** | The DataRefreshLog table stores the set of Currency Arbitrage calculations performed on the given date and enables the User for any possible opportunities in arbitrage trading. |
| **Columns** | TableName  RefreshDate |
| **SQLite Syntax** | CREATE TABLE IF NOT EXISTS TableRefreshLog (TableName TEXT NOT NULL, RefreshDate TEXT NOT NULL, PRIMARY KEY(TableName, RefreshDate)); |

**Entity relationship (ER) Diagrams**

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