**Altering your Data Model**

I went ahead and grabbed the data for the CNY from the same website, with the plan of adding it to my already existing data sets.

**Additional fields you would like to include**

|  |  |  |  |
| --- | --- | --- | --- |
| **Attributes** | **Description** | **Entity** | **Data Type** |
| CNY\_Change | The change in Value of Chinese Yuan since Jan. 2000 | Exchange\_History | float |
| CNY\_Rate | The value of 1 US Dollar in Chinese Yuan | Exchange\_Rate | smallmoney |



**Altering your Tables**

To save time, I imported the data into new tables using the import tool. I did it this way in order to be able to transfer the data into the other entities without having to insert one data point at a time.

|  |  |  |
| --- | --- | --- |
| map1 | map2 | added |

--Create new column in existing entities

ALTER TABLE Exchange\_History ADD CNY\_Change float NULL;

ALTER TABLE Exchange\_Rate ADD CNY\_Rate smallmoney NULL;

--Change the names and data types of values in the imported dataset (I thought I needed to do it beforehand)

EXEC sp\_RENAME ['CNY Change$'], CNY\_Change\_Data;

EXEC sp\_RENAME ['CNY Rate$'], CNY\_Rate\_Data;

EXEC sp\_RENAME '[CNY\_Change\_Data].[USD/CNY]', 'CNY\_Change', 'COLUMN';

EXEC sp\_RENAME '[CNY\_Rate\_Data].[USD/CNY]', 'CNY\_Rate', 'COLUMN';

EXEC sp\_RENAME '[CNY\_Change\_Data].[End Date]', 'Percent\_Month\_ID', 'COLUMN';

EXEC sp\_RENAME '[CNY\_Rate\_Data].[End Date]', 'Rate\_Month\_ID', 'COLUMN';

ALTER TABLE [CNY\_Change\_Data] ALTER COLUMN [Percent\_Month\_ID] date NOT NULL;

ALTER TABLE [CNY\_Change\_Data] ALTER COLUMN [CNY\_Change] float NOT NULL;

ALTER TABLE [CNY\_Rate\_Data] ALTER COLUMN [Rate\_Month\_ID] date NOT NULL;

ALTER TABLE [CNY\_Rate\_Data] ALTER COLUMN [CNY\_Rate] smallmoney NOT NULL;

--Used UPDATE to do a bulk transfer of entries from the imported dataset into the existing entities.

UPDATE Exchange\_History

SET Exchange\_History.CNY\_Change = ((CNY\_Change\_Data.CNY\_Change)\*100)

FROM Exchange\_History INNER JOIN CNY\_Change\_Data

ON (Exchange\_History.Percent\_Month\_ID = CNY\_Change\_Data.Percent\_Month\_ID);

UPDATE Exchange\_Rate

SET Exchange\_Rate.CNY\_Rate = ((CNY\_Rate\_Data.CNY\_Rate))

FROM Exchange\_Rate INNER JOIN CNY\_Rate\_Data

ON (Exchange\_Rate.Rate\_Month\_ID = CNY\_Rate\_Data.Rate\_Month\_ID);

--Dropped the imported dataset

DROP TABLE CNY\_Rate\_Data;

DROP TABLE CNY\_Change\_Data]

|  |  |
| --- | --- |
|  |  |

**Test Data**

SELECT AccountID,

CAST(ISNULL(AccountCloseDate,GETDATE()) AS DATE) AS Latest\_Date,

Exchange\_History.Percent\_Month\_ID,

Exchange\_History.EUR\_Change,

Exchange\_History.GBP\_Change,

Exchange\_History.CAD\_Change,

Exchange\_History.AUD\_Change,

Exchange\_History.JPY\_Change,

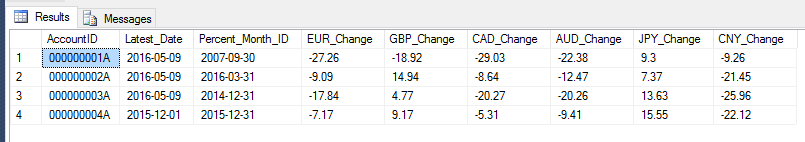
Exchange\_History.CNY\_Change

FROM Account INNER JOIN Exchange\_History

ON (YEAR(Account.AccountUpdated)=YEAR(Exchange\_History.Percent\_Month\_ID)

AND MONTH(Account.AccountUpdated)=MONTH(Exchange\_History.Percent\_Month\_ID))

ORDER BY AccountID ASC;



DECLARE @d AS date = GETDATE()

Select Account.AccountID,

CONVERT(varchar,Account.AccountBalance,1) AS 'Account Balance',

CONVERT(varchar, (CONVERT(money,(1-(EUR\_Change/100))\*Account.AccountBalance)), 1) AS 'EUR Value Change',

CONVERT(varchar, (CONVERT(money,(1-(GBP\_Change/100))\*Account.AccountBalance)), 1) AS 'GBP Value Change',

CONVERT(varchar, (CONVERT(money,(1-(CAD\_Change/100))\*Account.AccountBalance)), 1) AS 'CAD Value Change',

CONVERT(varchar, (CONVERT(money,(1-(AUD\_Change/100))\*Account.AccountBalance)), 1) AS 'AUD Value Change',

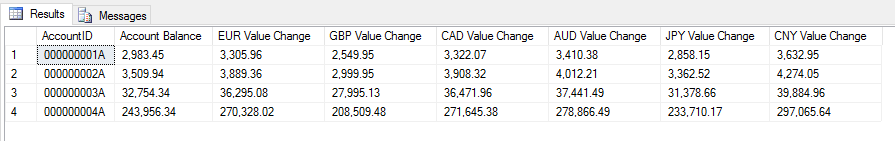
CONVERT(varchar, (CONVERT(money,(1-(JPY\_Change/100))\*Account.AccountBalance)), 1) AS 'JPY Value Change',

CONVERT(varchar, (CONVERT(money,(1-(CNY\_Change/100))\*Account.AccountBalance)), 1) AS 'CNY Value Change'

FROM Exchange\_History INNER JOIN Account

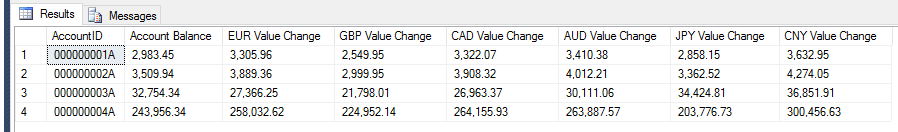
ON (YEAR(@d)=YEAR(Exchange\_History.Percent\_Month\_ID)

AND MONTH(DATEADD(MONTH,-1,@d))=MONTH(Exchange\_History.Percent\_Month\_ID));



**Special Query**

I got creative on this last query, due to its length, I’ll also be including a separate text file with only this query. In retrospect, it would’ve been better off as a stored procedure to call on since every section is the same except for the column being used to get the change in currency. It was a good learning experience though since I did learn about CASE, CONVERT, CAST, how to manipulate dates in SQL since it’s not an easy task, but most importantly how to make relationships between entities that don’t inherently have one. What this Query does -> It calculates the change in value over time from when the account first opened or 1/1/2000 (whichever is closer to today) and then compares it to when the account closed or today if it never did. It calculates the difference between the currency value and returns the amount the account would be worth in USD based on the initial comparison made. By looking at AccountID 000000001A you can see that GBP and JPY became more valuable, but the other currencies dropped based on that account being open before 1/1/2000 and still being open today. AccountID 000000003A and 000000004A are more difficult to calculate since 000000003A opened after 1/1/2000 and 000000004A closed before today. Perfecting the logic on this was incredibly time consuming, especially with all the nuances of using a variety of dates to create relationships between Account and Exchange\_Change. I did go back and test the results doing it all by hand with an excel spreadsheet and it was accurate. I only checked the EUR values thought because the logic doesn’t change.



-- BEGIN SPECIAL QUERY

DECLARE @d AS date = GETDATE()

DECLARE @e AS date = '2000-01-31'

SELECT DISTINCT Account.AccountID,

CONVERT(varchar, Account.AccountBalance, 1) AS 'Account Balance',

--EUR\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT EUR\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT EUR\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT EUR\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT EUR\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT EUR\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT EUR\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'EUR Value Change',

--GBP\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT GBP\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT GBP\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT GBP\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT GBP\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT GBP\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT GBP\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'GBP Value Change',

--CAD\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CAD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT CAD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CAD\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT CAD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CAD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CAD\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'CAD Value Change',

--AUD\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT AUD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT AUD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT AUD\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT AUD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT AUD\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT AUD\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'AUD Value Change',

--JPY\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT JPY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT JPY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT JPY\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT JPY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT JPY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT JPY\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'JPY Value Change',

--CNY\_Change

CASE WHEN (AccountOpenDate >= @e) THEN

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CNY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

-

(SELECT CNY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CNY\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

-

(SELECT CNY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountOpenDate = Percent\_Month\_ID OR

(Account.AccountOpenDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountOpenDate)<Percent\_Month\_ID AND

Account.AccountOpenDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

ELSE

CASE WHEN (AccountCloseDate IS NOT NULL) THEN

(CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CNY\_Change FROM Exchange\_History INNER JOIN Account ON

(Account.AccountCloseDate = Percent\_Month\_ID OR

(Account.AccountCloseDate != Percent\_Month\_ID AND

(DATEADD(m,-1,Account.AccountCloseDate)<Percent\_Month\_ID AND

Account.AccountCloseDate>Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1))

ELSE

((CONVERT(varchar, (CONVERT(money,(1-(

(SELECT CNY\_Change FROM Exchange\_History WHERE

(@d = Percent\_Month\_ID OR (@d != Percent\_Month\_ID

AND (DATEADD(m,-1,@d)<Percent\_Month\_ID))))

)/100)\*Account.AccountBalance)), 1)))

END

END AS 'CNY Value Change'

FROM Exchange\_History, Account

ORDER BY AccountID ASC;