



# THE WORLD BANK

## IBRD • IDA

Since 1947, the World Bank has funded over 12,000 development projects, via traditional loans, interest-free credits, and grants.

Source Data:

<https://data.world/worldbank/ibrd-statement-of-loans-latest>

## Content

1. Question Definition
2. Data Collection
3. E-R Diagram & Schema
4. Data Preparation
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7. Q&A

# QUESTION DEFINITION

Economy is good where there is money moving around. If I were to set up a lending facility or invest in developing sectors, what would be the best places to sink my money in and how fast can I get the returns

- Question 1) what are the top 5 common projects that the funds are channelled
- Question 2) which countries has the most number of projects
- Question 3) which countries borrowed the highest amount
- Question 4) How fast on the average a country repay in full
- Question 5) Longest time the board approve the loan
- Question 6) which country is frequent borrower

# APPRECIATING THE SOURCE DATA

**IBRD\_Statement\_of Loans - Latest Available Snapshot**

Draw Page Layout Formulas Data Review View Developer Help

Calibri 11

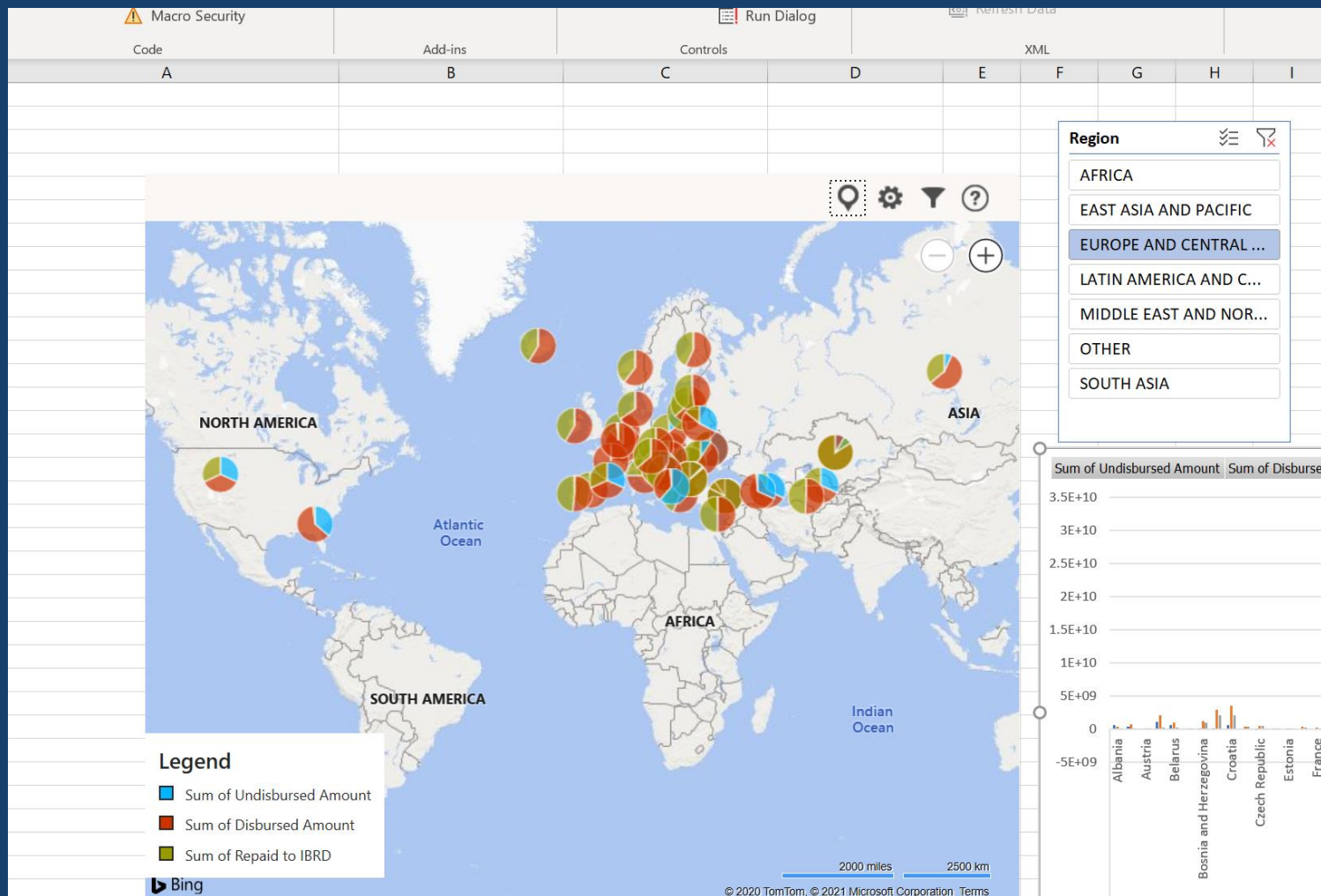
B I U A<sup>+</sup> A<sup>-</sup>

Font Alignment Number Styles Cells

Some features might be lost if you save this workbook in the comma-delimited (.csv) format. To preserve these features, save it in an Excel file format.

C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Region	Country C	Country	Borrower	Guarantor	Guarantor	Loan Type	Loan Status	Interest Rate	Currency	Project ID	Project Name	Original Principal	Cancelled	Undisbursed
EUROPE A FR		France	CREDIT NA	FR	France	NPL	Fully Repa	4.25 USD		P037383	RECONSTR	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	4.25 USD		P037452	RECONSTR	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	4.25 USD		P037452	RECONSTR	#####	\$0.00	\$0.00
EUROPE A DK		Denmark				NPL	Fully Repa	4.25 USD		P037362	RECONSTR	#####	\$0.00	\$0.00
EUROPE A LU		Luxembourg				NPL	Fully Repa	4.25 USD		P037451	RECONSTR	#####	\$0.00	\$0.00
LATIN AM CL		Chile	Ministry o	CL	Chile	NPL	Fully Repa	4.5 USD		P006578	POWER	#####	\$0.00	\$0.00
LATIN AM CL		Chile	Ministry o	CL	Chile	NPL	Fully Repa	3.75 USD		P006577	FOMENTC	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037453	SHIPPING	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037453	SHIPPING	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037454	SHIPPING	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037455	SHIPPING	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037456	SHIPPING	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	3.5625 USD		P037456	SHIPPING	#####	\$0.00	\$0.00
LATIN AM BR		Brazil	MinistA	BR	Brazil	NPL	Fully Repa	4.5 USD		P006214	POWER AI	#####	\$0.00	\$0.00
LATIN AM BR		Brazil	MinistA	BR	Brazil	NPL	Fully Repa	4.25 USD		P006214	POWER AI	#####	\$0.00	\$0.00
LATIN AM MX		Mexico	Secretaria	MX	Mexico	NPL	Fully Repa	4.5 USD		P007497	POWER I	#####	\$0.00	\$0.00
LATIN AM MX		Mexico	Secretaria	MX	Mexico	NPL	Fully Canc	4.5 USD		P007498	POWER II	#####	\$0.00	\$0.00
EUROPE A BE		Belgium	MINISTERI	BE	Belgium	NPL	Fully Repa	4.25 USD		P037358	INDUSTRY	#####	\$0.00	\$0.00
EUROPE A NL		Netherlands				NPL	Fully Repa	4 USD		P037457	INDUSTRI	#####	\$0.00	\$0.00
EUROPE A FI		Finland				NPL	Fully Repa	4 USD		P037366	INDUSTRY	#####	\$0.00	\$0.00
SOUTH AS IN		India	CONTROLI	IN	India	NPL	Fully Repa	4 USD		P009588	RAILWAY	#####	\$0.00	\$0.00
LATIN AM CO		Colombia	MINISTERI	CO	Colombia	NPL	Fully Repa	3.5 USD		P006682	AGRICULT	#####	\$0.00	\$0.00
SOUTH AS IN		India	CONTROLI	IN	India	NPL	Fully Repa	3.5 USD		P009586	FARM IMF	#####	\$0.00	\$0.00
EUROPE A YU		Yugoslavia, former				NPL	Fully Repa	3 USD		P009133	FORESTRY	#####	\$0.00	\$0.00
EUROPE A FI		Finland				NPL	Fully Repa	3 USD		P037365	FORESTRY	#####	\$0.00	\$0.00
LATIN AM SV		El Salvado	MINISTRY	SV	El Salvado	NPL	Fully Repa	4.25 USD		P007137	RIO LEMP,	#####	\$0.00	\$0.00
SOUTH AS IN		India	CONTROLI	IN	India	NPL	Fully Repa	4 USD		P009587	BOKAROKI	#####	\$0.00	\$0.00
LATIN AM MX		Mexico	Secretaria	MX	Mexico	NPL	Fully Repa	4.5 USD		P007499	POWER III	#####	\$0.00	\$0.00

ment of Loans - Lates



# APPRECIATION OF DATA VIA SLICE

# ATTRIBUTES IN A SINGLE TABLE

Loan Number  
Region  
Country Code  
Country  
Borrower  
Guarantor Country Code  
Guarantor  
Loan Type  
Loan Status  
Interest Rate  
Currency of Commitment  
Project ID  
Project Name  
Original Principal Amount

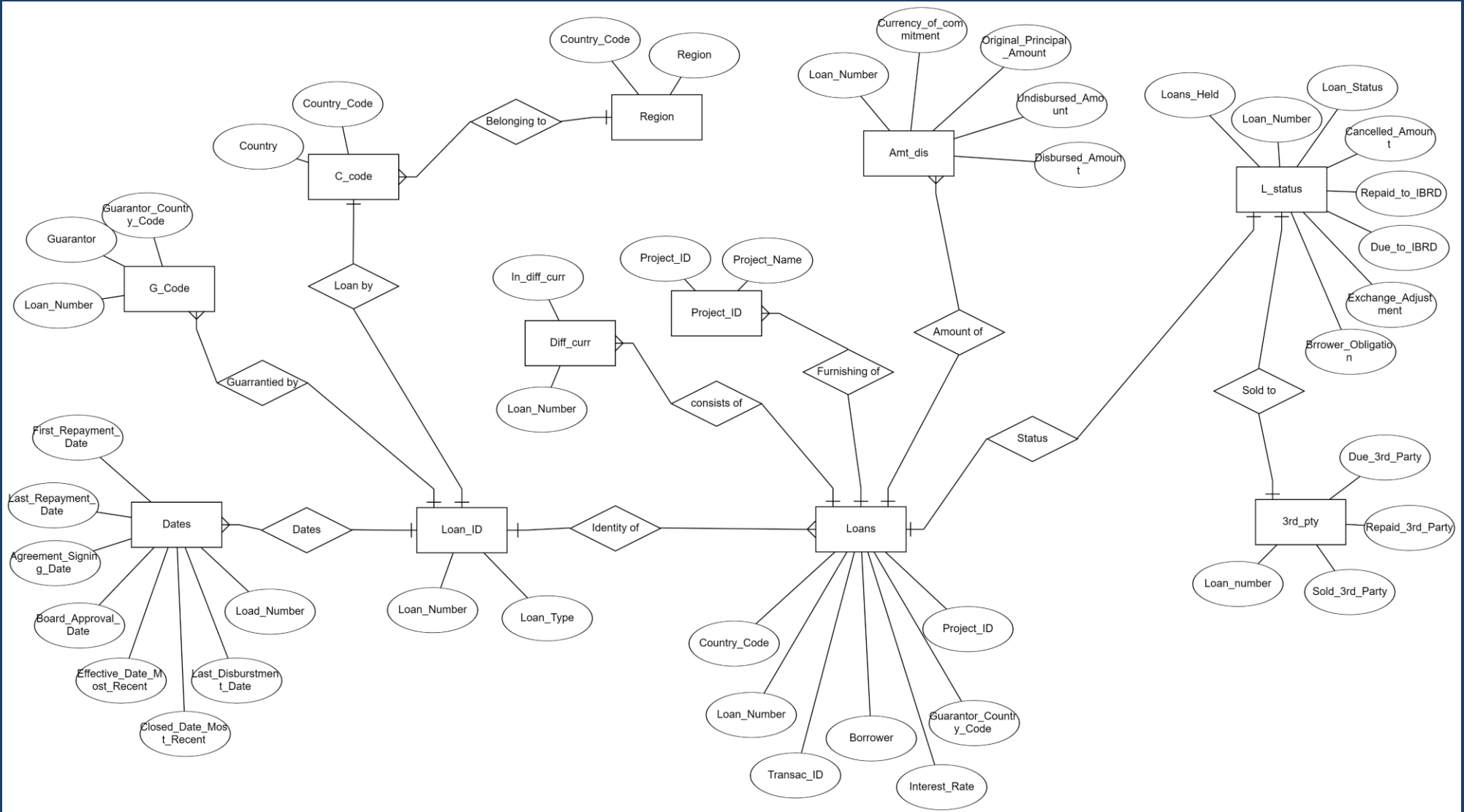
Cancelled Amount  
Undisbursed Amount  
Disbursed Amount  
Repaid to IBRD  
Due to IBRD  
Exchange Adjustment  
Borrower's Obligation  
Sold 3rd Party  
Repaid 3rd Party  
Due 3rd Party  
Loans Held  
First Repayment Date  
Last Repayment Date  
Agreement Signing Date

Board Approval Date  
Effective Date (Most Recent)  
Closed Date (Most Recent)  
Last Disbursement Date  
End of Period

# DECODING THE ATTRIBUTES

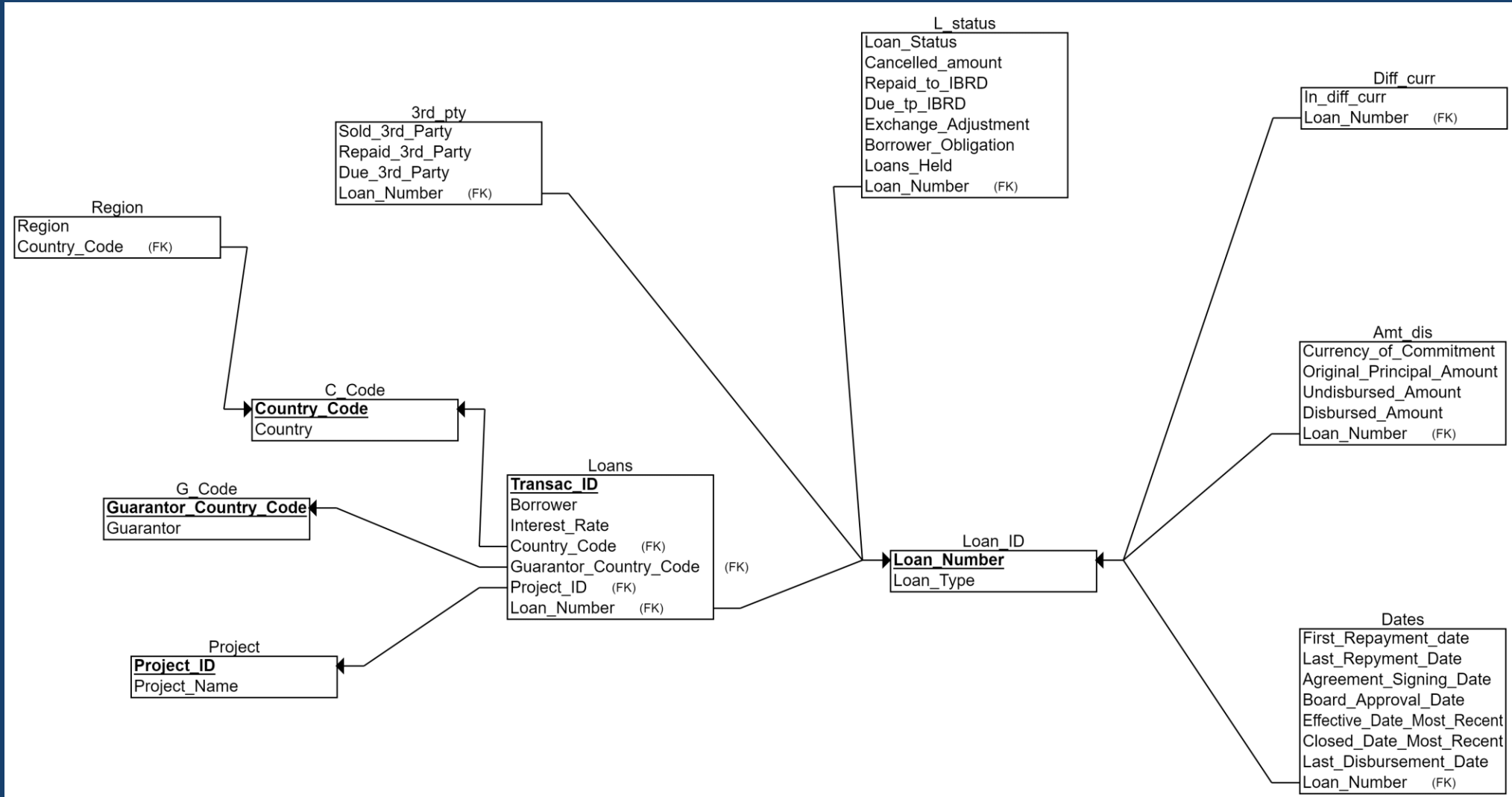
Column Name	Example	Assumption
End of Period	11/30/2020 12:00:00 AM	Date of the release of this sheet (redundant)
Loan Number	IBRD00010	Unique identifier of loan
Region	EUROPE AND CENTRAL ASIA	Region of borrower
Country Code	FR	Unique borrower identifier
Country	France	Name of country
Borrower	CREDIT NATIONAL	The institution in the borrower's country
Guarantor Country Code	FR	Unique borrower identifier code of the guarantor
Guarantor	France	Name of the guarantor for the loan
Loan Type	NPL	NPL non performing loan
Loan Status	Fully Repaid	
Interest Rate	4.25	
Currency of Commitment		
Project ID	P037383	Unique identifier for loan to disbursed to
Project Name	RECONSTRUCTION	
Original Principal Amount	250,000,000	
Cancelled Amount	0	
Undisbursed Amount	0	
Disbursed Amount	250,000,000	
Repaid to IBRD	38,000	
Due to IBRD	0	
Exchange Adjustment	0	
Borrower's Obligation	0	Amount the borrower has to pay
Sold 3rd Party	249,962,000	
Repaid 3rd Party	249,962,000	
Due 3rd Party	0	
Loans Held	0	
First Repayment Date	11/1/1952 0:00	
Last Repayment Date	5/1/1977 0:00	
Agreement Signing Date	5/9/1947 0:00	
Board Approval Date	5/9/1947 0:00	
Effective Date (Most Recent)	6/9/1947 0:00	
Closed Date (Most Recent)	12/31/1947 12:00:00 AM	
Last Disbursement Date		

# ER DIAGRAM





# SCHEMA



# DEFINING THE SCHEMA

Diff_curr		
Loan_Number	FK	nvarchar(50)
In_diff_curr		nvarchar(50)

Region		
Country_Code	FK	nvarchar(50)
Region		nvarchar(50)

C_Code		
Country_Code	ID	nvarchar(50)
Country		nvarchar(50)

G_Code		
Guarantor_Country_Code	ID	nvarchar(50)
Guarantor		nvarchar(50)

Project		
Project_ID	ID	nvarchar(50)
Project_Name		nvarchar(50)

Loan_ID		
Loan_Number	ID	nvarchar(50)
Loan_Type		nvarchar(50)

Loans		
Transac_ID	ID	INT
Loan_Number	FK	nvarchar(50)
Country_Code	FK	nvarchar(50)
Borrower		nvarchar(50)
Guarantor_Country_Code	FK	nvarchar(50)
Interest_Rate		float
Project_ID	FK	nvarchar(50)

L_status		
Loan_Number	FK	nvarchar(50)
Loan_Status		nvarchar(50)
Cancelled_Amount		float
Repaid_to_IBRD		float
Due_to_IBRD		float
Exchange_Adjustment		float
Borrower_Obligation		float
Loans_Held		float

3rd_pty		
Loan_Number	FK	nvarchar(50)
Sold_3rd_Party		float
Repaid_3rd_Party		float
Due_3rd_Party		float

Amt_dis		
Loan_Number	FK	nvarchar(50)
Currency_of_Commitment		nvarchar(50)
Original_Principal_Amount		float
Undisbursed_Amount		float
Disbursed_Amount		float

Dates		
Loan_Number	FK	nvarchar(50)
First_Repayment_Date		Date
Last_Repayment_Date		Date
Agreement_Signing_Date		Date
Board_Approval_Date		Date
Effective_Date_Most_Recent		Date
Closed_Date_Most_Recent		Date
Last_Disbursement_Date		Date

# **DATA ANALYSIS**

Question :

what are the top 5  
common projects that  
the funds are channelled

Loans		
Transac_ID	ID	INT
Loan_Number	FK	nvarchar(50)
Country_Code	FK	nvarchar(50)
Borrower		nvarchar(50)
Guarantor_Country_Code	FK	nvarchar(50)
Interest_Rate		float
Project_ID	FK	nvarchar(50)

Loans look  
Up project

Project		
Project_ID	ID	nvarchar(50)
Project_Name		nvarchar(50)

```
SELECT      L.Project_ID,  
            P.Project_Name  
INTO      temp_table  
FROM      dbo.Loans as L  
join      dbo.Project as P  
on  L.Project_ID=P.Project_ID
```

```
SELECT TOP (5)count(Project_ID),Project_Name  
FROM temp_table  
GROUP BY Project_Name  
ORDER BY count(Project_ID) desc
```

```
DROP TABLE temp_table
```

Creates a  
physical  
table

temp_table		
Project_ID		
Project_Name		

```
GROUP BY Project_Name  
ORDER BY count(Project_ID) desc
```

```
DROP TABLE temp_table
```

165 %

Results Messages

	(No column name)	Project_Name
1	75	EDUCATION II
2	51	POWER
3	41	OECS: Telecom Reform
4	38	PK: HIGHWAYS REHAB
5	36	EDUCATION I

Question:

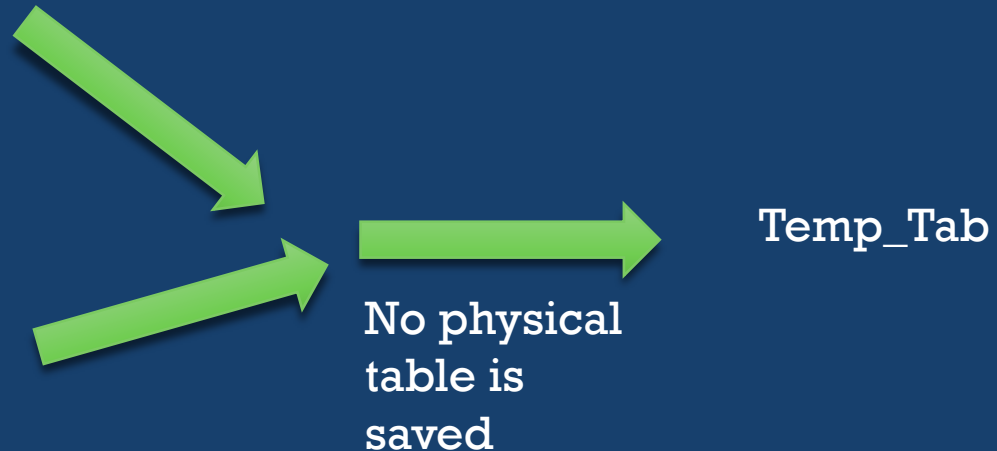
which countries has the  
most number of projects

C_Code		
Country_Code	ID	nvarchar(50)
Country		nvarchar(50)

Loans		
Transac_ID	ID	INT
Loan_Number	FK	nvarchar(50)
Country_Code	FK	nvarchar(50)
Borrower		nvarchar(50)
Guarantor_Country_Code	FK	nvarchar(50)
Loan_Type		nvarchar(50)
Interest_Rate		float
Project_ID	FK	nvarchar(50)

```
WITH Temp_Tab AS (  
    SELECT L.Country_Code,C.Country  
    FROM dbo.Loans as L  
    join dbo.C_Code as C  
    on L.Country_Code=C.Country_Code)
```

```
SELECT TOP (5)count(Country_Code),Country  
FROM temp_tab  
GROUP BY Country  
ORDER BY count(Country_Code) desc;
```



```
SELECT TOP (5) count(Country_Code)
FROM temp_tab
GROUP BY Country
ORDER BY count(Country_Code) desc
```

165 %

Results

Messages

	(No column name)	Country
1	1328	Indonesia
2	676	Brazil
3	659	Mexico
4	549	Colombia
5	513	Philippines

Question:

which countries  
borrowed the highest  
amount

Amt_dis		
Loan_Number	FK	nvarchar(50)
Currency_of_Commitment		nvarchar(50)
Original_Principal_Amount		float
Undisbursed_Amount		float
Disbursed_Amount		float

C_Code		
Country_Code	ID	nvarchar(50)
Country		nvarchar(50)

Loans		
Transac_ID	ID	INT
Loan_Number	FK	nvarchar(50)
Country_Code	FK	nvarchar(50)
Borrower		nvarchar(50)
Guarantor_Country_Code	FK	nvarchar(50)
Loan_Type		nvarchar(50)
Interest_Rate		float
Project_ID	FK	nvarchar(50)

Option to  
save for  
slicing

```
WITH Temp_A AS
    (SELECT Loan_Number,
            Currency_of_Commitment,
            Original_Principal_Amount
    FROM Amt_Dis
    WHERE Original_Principal_Amount>0),

    Temp_B AS
    (SELECT Country_Code, Loan_Number
    FROM Loans),

    Temp_C AS
    (SELECT Currency_of_Commitment,
            Original_Principal_Amount,
            Country_Code
    FROM Temp_A
    join Temp_B
    on Temp_A.Loan_Number=Temp_B.Loan_Number)

SELECT      Country,
            Currency_of_Commitment,
            Original_Principal_Amount,
            C.Country_Code
--into Top_B_List
FROM        dbo.C_Code AS C
join  Temp_C
on    c.Country_Code=Temp_C.Country_Code
order by Original_Principal_Amount,Currency_of_Commitment DESC;
```



```

C.Country_Code
--into Top_B_List
FROM    dbo.C_Code AS C
join    Temp_C
on      c.Country_Code=Temp_C.Country_Code
order by Original_Principal_Amount,Currency_of_Commitment DESC;

```

165 %

Results

Messages

	Country	Currency_of_Commitment	Original_Principal_Amount	Country_Code
1	World	USD	0.39	1W
2	Argentina	USD	9224.78	AR
3	Mexico	USD	34689.7	MX
4	Peru	USD	36128.6	PE
5	Macedonia, former Yugoslav Republic of	USD	38880.02	MK
6	El Salvador	USD	92055.88	SV
7	World	DEM	94413.31	1W
8	Tunisia	EUR	111360.53	TN
9	Tunisia	EUR	111360.53	TN
10	Mauritius	USD	112203.65	MU
11	St. Kitts and Nevis	USD	130000	KN
12	Chile	USD	151579.67	CL
13	Croatia	USD	183162	HR
14	Malaysia	USD	192011.17	MY
15	Ecuador	USD	196966.02	EC

Question: How fast on the average a country repay in full

```
SELECT  
Avg(DATEDIFF(Year,First_Repayment_Date,Last_Repayment_Date)) AS average_years  
FROM dbo.Dates
```

```
SELECT  
    Avg(DATEDIFF(Year,First_Repayment_Date,Last_Payment_Date))  
FROM dbo.Dates
```

165 %

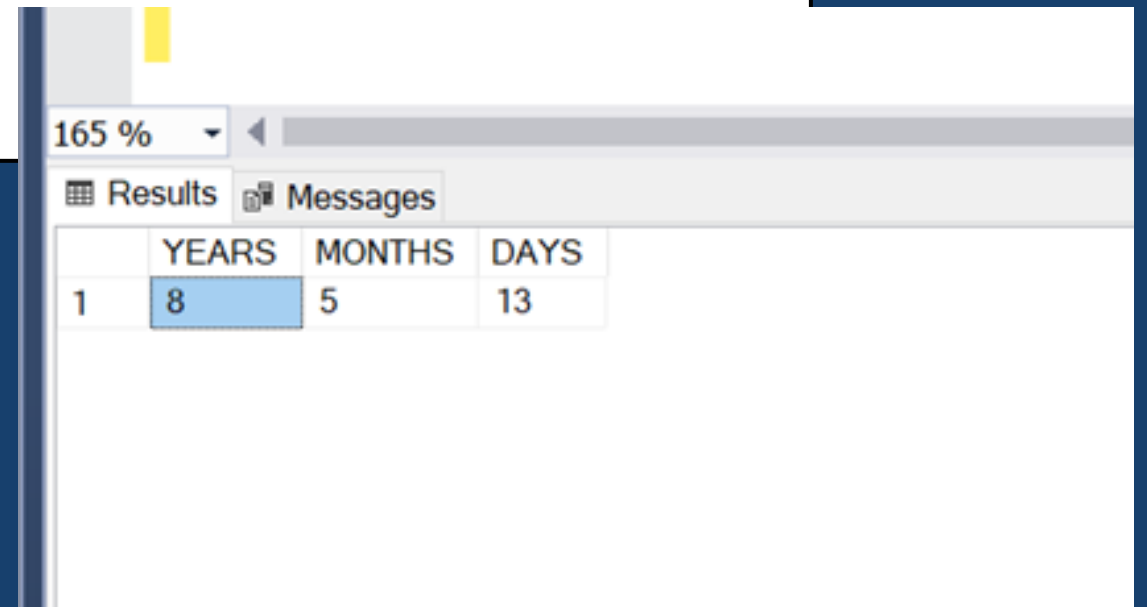
Results Messages

	average_years
1	12

Question: Longest time the board approve the loan

```
declare @days int
SET @days = (select
                MAX(DATEDIFF(day, Board_Approval_Date, Agreement_Signing_Date))
                FROM Dates)

SELECT
[YEARS] = @days / 365,
[MONTHS] = (@days % 365) / 30,
[DAYS] = (@days % 365) % 30
```



The screenshot shows a SQL Server Enterprise Manager window with a query results grid. The grid has four columns: an index column, and three columns labeled YEARS, MONTHS, and DAYS. The first row of data shows the values 8, 5, and 13 respectively. The window also features a zoom level of 165% and tabs for Results and Messages.

	YEARS	MONTHS	DAYS
1	8	5	13

Question : Which countries are frequent borrowers

	country	No_of_borrows
1	Indonesia	2157
2	Mexico	1053
3	Colombia	927
4	Brazil	920
5	Philippines	784
6	Turkey	740
7	Tunisia	511
8	Argentina	510
9	Algeria	480
10	Morocco	452
11	China	440
12	Thailand	412
13	Panama	363
14	India	323
15	Dominican Republic	308
16	World	303
17	Serbia	294
18	Pakistan	244

```

WITH Temp_A AS
    (SELECT Loan_Number, Country_Code
    FROM Loans
    WHERE loan_Number is not null),

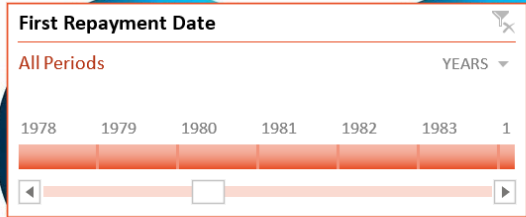
    Temp_B AS
    (SELECT Loan_Number, First_Repayment_Date
    FROM Dates
    WHERE First_Repayment_Date is not null),

    Temp_C AS
    (SELECT Temp_A.Loan_Number,
            Country_Code, First_Repayment_Date
    FROM Temp_A
    join Temp_B
    on Temp_A.Loan_Number=Temp_B.Loan_Number)

SELECT      Country, C.Country_Code, Loan_Number, First_Repayment_Date
            into Top_B_List ----- creating a phiscal table
FROM        dbo.C_Code AS C
join  Temp_C
on    c.Country_Code=Temp_C.Country_Code;

select country, count(*) 'No_of_borrows'
FROM Top_B_List
group by Country
order by 2 DESC;

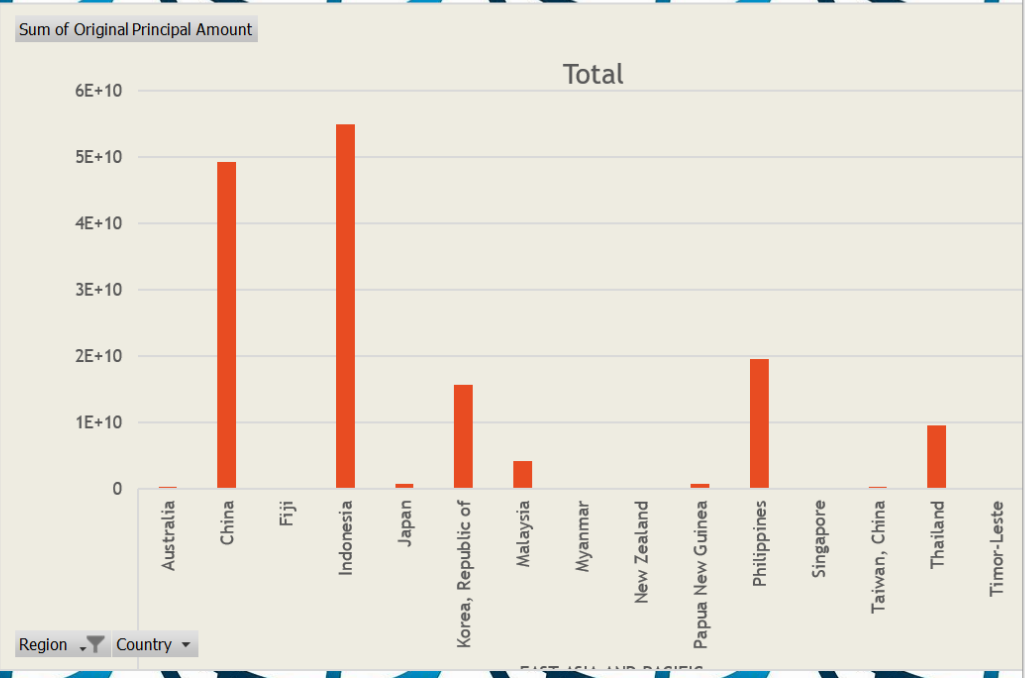
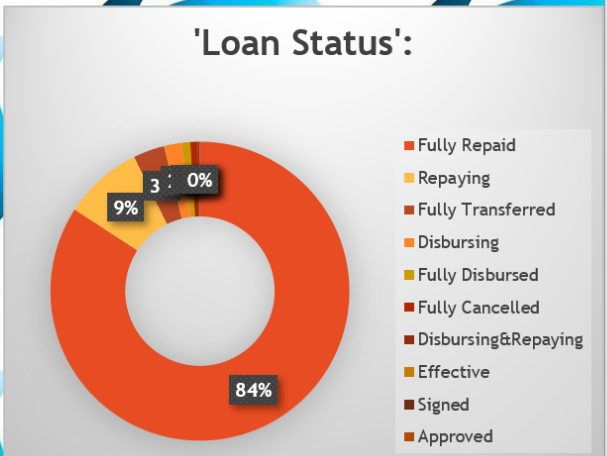
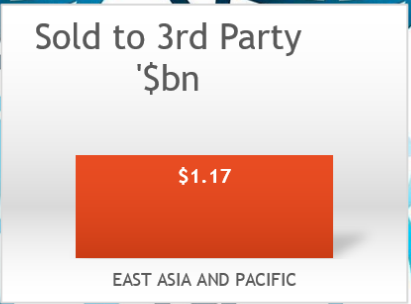
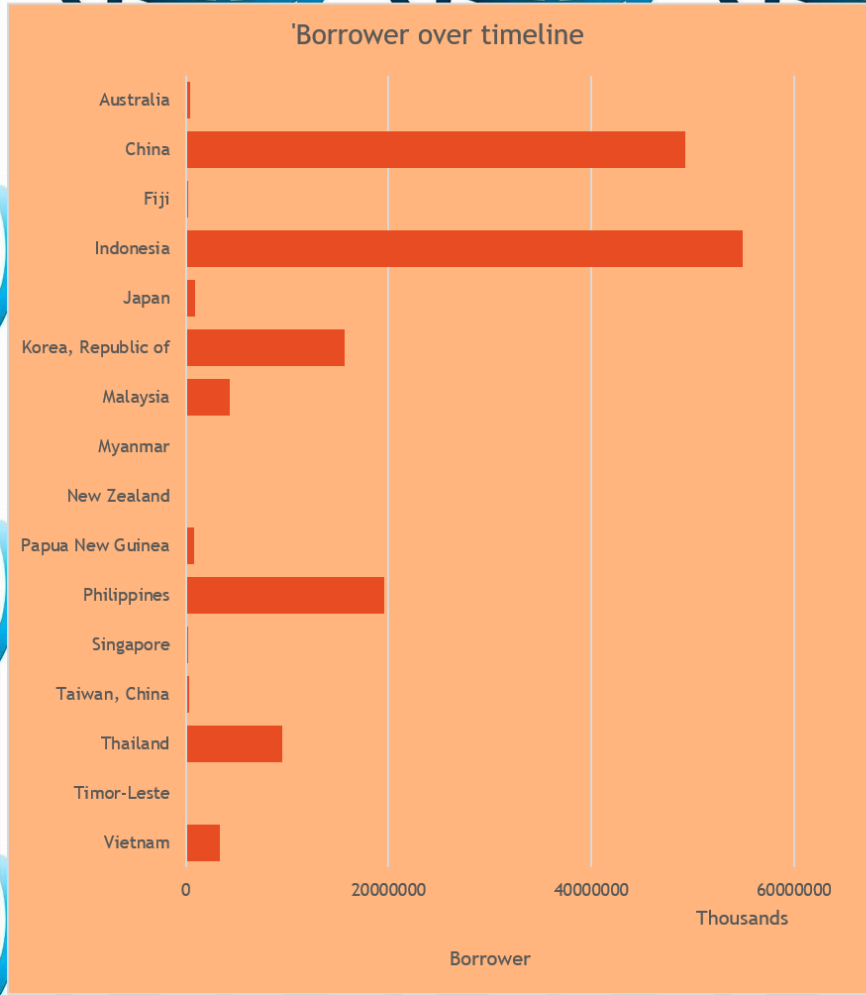
```



# IBRD Statement of Loans

- ### Country
- Japan
  - Korea, Republic of
  - Malaysia
  - Myanmar
  - New Zealand
  - Papua New Guinea
  - Philippines
  - Singapore
  - Taiwan, China
  - Thailand
  - Timor-Leste
  - Vietnam

- ### Region
- AFRICA
  - EAST ASIA AND PACIFIC
  - EUROPE AND CENTR...
  - LATIN AMERICA AND ...
  - MIDDLE EAST AND N...
  - OTHER
  - SOUTH ASIA



# WHAT DOES THE DATA SHOW ?

The top 5 projects

	(No column name)	Project_Name
1	75	EDUCATION II
2	51	POWER
3	41	OECS: Telecom Reform
4	38	PK: HIGHWAYS REHAB
5	36	EDUCATION I

which countries borrowed the highest amount

	Country	Currency_of_Co
1	World	USD
2	Argentina	USD
3	Mexico	USD
4	Peru	USD
5	Macedonia, former Yugoslav Republic of	USD
6	El Salvador	USD
7	World	DEM
8	Tunisia	EUR
9	Tunisia	EUR
10	Mauritius	USD
11	St. Kitts and Nevis	USD
12	Chile	USD

which countries has the most number of projects

	(No column name)	Country
1	1328	Indonesia
2	676	Brazil
3	659	Mexico
4	549	Colombia
5	513	Philippines

which country is frequent borrower:

	country	No_of_borrows
1	Indonesia	2157
2	Mexico	1053
3	Colombia	927
4	Brazil	920
5	Philippines	784
6	Turkey	740
7	Tunisia	511
8	Argentina	510
9	Algeria	480
10	Morocco	452
11	China	440

The average time for ROI is 12 years.  
Mexico seems to be the most active country.  
This puts the question of getting returns from investing in this country.

With the data from dashboard, investment in Indonesia achieves 91% chance of return of capital.

Education and Power are the top projects with dispersion of funding

QA



# JOURNEY THROUGH THE DATA

- Data collection from various sources
- Creating tables and Loading data into SQL databases
- Data Preparation
  - \* Data Cleaning
  - \* Data Transformation
- Data Analysis using SQL
- Creating Interactive Dashboard and Visualization using Excel Dashboards
- Communicating insights derived
- Presenting to the stakeholders