

1. The World Bank's international debt data

It's not that we humans only take debts to manage our necessities. A country may also take debt to manage its economy. For example, infrastructure spending is one costly ingredient required for a country's citizens to lead comfortable lives. [The World Bank](#) is the organization that provides debt to countries.

This notebook contains analysis on international debt data collected by The World Bank. The dataset contains information about the amount of debt (in USD) owed by developing countries across several categories.

The analysis answers the following questions

- What is the total amount of debt that is owed by the countries listed in the dataset?
- Which country owns the maximum amount of debt and what does that amount look like?
- What is the average amount of debt owed by countries across different debt indicators?



The `international_debt` table contains the data on which I have performed this analysis. The first query reveals all the columns in the dataset.

In [2]:

```
%%sql
postgres://international_debt

SELECT
    *
FROM
    international_debt
LIMIT
    10
```

10 rows affected.

Out[2]:

country_name	country_code	indicator_name	indicator_code	debt
Afghanistan	AFG	Disbursements on external debt, long-term (DIS, current US\$)	DT.DIS.DLXF.CD	72894453.700000003
Afghanistan	AFG	Interest payments on external debt, long-term (INT, current US\$)	DT.INT.DLXF.CD	53239440.100000001
Afghanistan	AFG	PPG. bilateral (AMT. current US\$)	DT.AMT.BLAT.CD	61739336.899999999

Afghanistan	AFG	PPG, bilateral (DIS, current US\$)	DT.DIS.BLAT.CD	49114729.399999999
Afghanistan	AFG	PPG, bilateral (INT, current US\$)	DT.INT.BLAT.CD	39903620.100000001
Afghanistan	AFG	PPG, multilateral (AMT, current US\$)	DT.AMT.MLAT.CD	39107845
Afghanistan	AFG	PPG, multilateral (DIS, current US\$)	DT.DIS.MLAT.CD	23779724.300000001
Afghanistan	AFG	PPG, multilateral (INT, current US\$)	DT.INT.MLAT.CD	13335820
Afghanistan	AFG	PPG, official creditors (AMT, current US\$)	DT.AMT.OFFT.CD	100847181.900000006
Afghanistan	AFG	PPG, official creditors (DIS, current US\$)	DT.DIS.OFFT.CD	72894453.700000003

2. Finding the number of distinct countries

From the first ten rows, we can see the amount of debt owed by *Afghanistan* in the different debt indicators. But we do not know the number of different countries we have on the table. There are repetitions in the country names because a country is most likely to have debt in more than one debt indicator.

Without a count of unique countries, we will not be able to perform our statistical analyses holistically.

Next, we will extract the number of unique countries present in the table.

In [4]:

```
%%sql
SELECT
    COUNT(DISTINCT(country_name)) AS total_distinct_countries
FROM international_debt;
```

* postgresql:///international_debt
1 rows affected.

Out[4]:

total_distinct_countries
124

The query above shows that the total number of distinct countries in the dataset are **124**. Next let's look at the list of these countries ordered alphabetically

In [15]:

```
%%sql
SELECT
    DISTINCT(country_name) AS distinct_countries
FROM international_debt
ORDER BY distinct_countries;
```

* postgresql:///international_debt
124 rows affected.

Out[15]:

distinct_countries
Afghanistan
Albania
Algeria
Angola
Armenia
Azerbaijan
Bangladesh
Belarus
Belize

	Benin
	Bhutan
	Bolivia
	Bosnia and Herzegovina
	Botswana
	Brazil
	Bulgaria
	Burkina Faso
	Burundi
	Cabo Verde
	Cambodia
	Cameroon
	Central African Republic
	Chad
	China
	Colombia
	Comoros
	Congo, Dem. Rep.
	Congo, Rep.
	Costa Rica
	Cote d'Ivoire
	Djibouti
	Dominica
	Dominican Republic
	Ecuador
	Egypt, Arab Rep.
	El Salvador
	Eritrea
	Eswatini
	Ethiopia
	Fiji
	Gabon
	Gambia, The
	Georgia
	Ghana
	Grenada
	Guatemala
	Guinea
	Guinea-Bissau
	Guyana
	Haiti
	Honduras
	IDA only
	India
	Indonesia

Iran, Islamic Rep.

Jamaica

Jordan

Kazakhstan

Kenya

Kosovo

Kyrgyz Republic

Lao PDR

Least developed countries: UN classification

Lebanon

Lesotho

Liberia

Macedonia, FYR

Madagascar

Malawi

Maldives

Mali

Mauritania

Mauritius

Mexico

Moldova

Mongolia

Montenegro

Morocco

Mozambique

Myanmar

Nepal

Nicaragua

Niger

Nigeria

Pakistan

Papua New Guinea

Paraguay

Peru

Philippines

Romania

Russian Federation

Rwanda

Samoa

Sao Tome and Principe

Senegal

Serbia

Sierra Leone

Solomon Islands

Somalia

South Africa
South Asia
Sri Lanka
St. Lucia
St. Vincent and the Grenadines
Sudan
Syrian Arab Republic
Tajikistan
Tanzania
Thailand
Timor-Leste
Togo
Tonga
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
Uzbekistan
Vanuatu
Venezuela, RB
Vietnam
Yemen, Rep.
Zambia
Zimbabwe

3. Finding out the distinct debt indicators

There is a column called `indicator_name` that briefly specifies the purpose of taking the debt. Just beside that column, there is another column called `indicator_code` which symbolizes the category of these debts. Knowing about these various debt indicators will help us to understand the areas in which a country can possibly be indebted to.

In [10]:

```
%%sql
SELECT
    DISTINCT(indicator_code) AS distinct_debt_indicators
FROM
    international_debt
ORDER BY
    distinct_debt_indicators;
```

* postgresql:///international_debt
25 rows affected.

Out[10]:

distinct_debt_indicators
DT.AMT.BLAT.CD
DT.AMT.DLXF.CD
DT.AMT.DPNG.CD

DT.AMT.MLAT.CD

DT.AMT.OFFT.CD

DT.AMT.PBND.CD

DT.AMT.PCBK.CD

DT.AMT.PROP.CD

DT.AMT.PRVT.CD

DT.DIS.BLAT.CD

DT.DIS.DLXF.CD

DT.DIS.MLAT.CD

DT.DIS.OFFT.CD

DT.DIS.PCBK.CD

DT.DIS.PROP.CD

DT.DIS.PRVT.CD

DT.INT.BLAT.CD

DT.INT.DLXF.CD

DT.INT.DPNG.CD

DT.INT.MLAT.CD

DT.INT.OFFT.CD

DT.INT.PBND.CD

DT.INT.PCBK.CD

DT.INT.PROP.CD

DT.INT.PRVT.CD

4. Totaling the amount of debt owed by the countries

The financial debt of a particular country represents its economic state. Next, let's look at the global debt situation and find out the total amount of debt (in USD) that is owed by the different countries. This will give us a sense of how the overall economy of the entire world is holding up.

In [11]:

```
%%sql
SELECT
    ROUND(SUM(debt)/1000000, 2) AS total_debt
FROM international_debt;
```

```
* postgresql:///international_debt
1 rows affected.
```

Out[11]:

total_debt

3079734.49

5. Country with the highest debt

That is more than *3 million million* USD, an amount which is really hard for us to fathom.

Next let's look at the country that owns the highest amount of debt along with the amount. **Note** that this debt is the sum of different debts owed by a country across several categories. This will help to understand more about the country in terms of its socio-economic scenarios.

In [16]:

```
%%sql
```

```
%%sql
SELECT
    country_name,
    SUM(debt) AS total_debt
FROM international_debt
GROUP BY country_name
ORDER BY total_debt DESC
LIMIT 1;
```

```
* postgresql:///international_debt
1 rows affected.
```

Out[16]:

country_name	total_debt
China	285793494734.200001568

Next, let's look at the top 10 countries with most amount of debt

In [17]:

```
%%sql
SELECT
    country_name,
    SUM(debt) AS total_debt
FROM international_debt
GROUP BY country_name
ORDER BY total_debt DESC
LIMIT 10;
```

```
* postgresql:///international_debt
10 rows affected.
```

Out[17]:

country_name	total_debt
China	285793494734.200001568
Brazil	280623966140.800007581
South Asia	247608723990.600003211
Least developed countries: UN classification	212880992791.900000988
Russian Federation	191289057259.200001943
IDA only	179048127207.299999298
Turkey	151125758035.300003616
India	133627060958.399997148
Mexico	124596786217.300001668
Indonesia	113435696693.499999149

China comes out as the country with highest debt

6. Average amount of debt across indicators

We already have an idea of the different debt indicators in which the countries owe their debts. Next, we find out on an average how much debt a country owes? This will give us a better sense of the distribution of the amount of debt across different indicators.

In [19]:

```
%%sql
SELECT
    indicator_code AS debt_indicator,
    indicator_name,
    AVG(debt) as average_debt
```

```
FROM international_debt
GROUP BY debt_indicator, indicator_name
ORDER BY average_debt DESC
LIMIT 10;
```

```
* postgresql:///international_debt
10 rows affected.
```

Out[19]:

debt_indicator	indicator_name	average_debt
DT.AMT.DLXF.CD	Principal repayments on external debt, long-term (AMT, current US\$)	5904868401.499193612
DT.AMT.DPNG.CD	Principal repayments on external debt, private nonguaranteed (PNG) (AMT, current US\$)	5161194333.812658349
DT.DIS.DLXF.CD	Disbursements on external debt, long-term (DIS, current US\$)	2152041216.890243888
DT.DIS.OFFT.CD	PPG, official creditors (DIS, current US\$)	1958983452.859836046
DT.AMT.PRVT.CD	PPG, private creditors (AMT, current US\$)	1803694101.963265321
DT.INT.DLXF.CD	Interest payments on external debt, long-term (INT, current US\$)	1644024067.650806481
DT.DIS.BLAT.CD	PPG, bilateral (DIS, current US\$)	1223139290.398230108
DT.INT.DPNG.CD	Interest payments on external debt, private nonguaranteed (PNG) (INT, current US\$)	1220410844.421518983
DT.AMT.OFFT.CD	PPG, official creditors (AMT, current US\$)	1191187963.083064523
DT.AMT.PBND.CD	PPG, bonds (AMT, current US\$)	1082623947.653623188

We can see that the indicator `DT.AMT.DLXF.CD` tops the chart of average debt. This category includes repayment of long term debts. Countries take on long-term debt to acquire immediate capital.

An interesting observation in the above finding is that there is a huge difference in the amounts of the indicators after the second one. This indicates that the first two indicators might be the most severe categories in which the countries owe their debts.

7. The highest amount of principal repayments

We can investigate a bit more to find out which country owes the highest amount of debt in the category of long term debts (`DT.AMT.DLXF.CD`). Since not all the countries suffer from the same kind of economic disturbances, this finding will allow us to understand that particular country's economic condition a bit more specifically.

In [26]:

```
%%sql
SELECT
    country_name,
    indicator_name
FROM international_debt
WHERE debt = (SELECT
                MAX(debt)
                FROM international_debt
                WHERE indicator_code = 'DT.AMT.DLXF.CD');
```

```
* postgresql:///international_debt
1 rows affected.
```

Out[26]:

country_name	indicator_name
China	Principal repayments on external debt, long-term (AMT, current US\$)

China has the highest amount of debt in the long-term debt (`DT.AMT.DLXF.CD`) category. This is verified by [The World Bank](#).

8. The most common debt indicator

Long-term debt is the topmost category when it comes to the average amount of debt. But is it the most common indicator in which the countries owe their debt? Let's find that out.

In [4]:

```
%%sql
SELECT
    indicator_code,
    COUNT(indicator_code) AS indicator_count
FROM
    international_debt
GROUP BY
    indicator_code
ORDER BY
    indicator_count DESC, indicator_code DESC
LIMIT
    20;
```

```
* postgresql:///international_debt
20 rows affected.
```

Out[4]:

indicator_code	indicator_count
DT.INT.OFFT.CD	124
DT.INT.MLAT.CD	124
DT.INT.DLXF.CD	124
DT.AMT.OFFT.CD	124
DT.AMT.MLAT.CD	124
DT.AMT.DLXF.CD	124
DT.DIS.DLXF.CD	123
DT.INT.BLAT.CD	122
DT.DIS.OFFT.CD	122
DT.AMT.BLAT.CD	122
DT.DIS.MLAT.CD	120
DT.DIS.BLAT.CD	113
DT.INT.PRVT.CD	98
DT.AMT.PRVT.CD	98
DT.INT.PCBK.CD	84
DT.AMT.PCBK.CD	84
DT.INT.DPNG.CD	79
DT.AMT.DPNG.CD	79
DT.INT.PBND.CD	69
DT.AMT.PBND.CD	69

There are a total of six debt indicators in which all the countries listed in our dataset have taken debt. The indicator `DT.AMT.DLXF.CD` is also there in the list. So, this gives us a clue that all these countries are suffering from a common economic issue.

9. Other viable debt issues and conclusion

Next, let's find out the maximum amount of debt that each country has. With this, we will be in a position to identify the other plausible economic issues a country might be going through.

In [5]:

```
%%sql
SELECT
    country_name,
    MAX(debt) AS maximum_debt
FROM
    international_debt
GROUP BY
    country_name
ORDER BY
    maximum_debt DESC
LIMIT 10;

* postgresql:///international_debt
10 rows affected.
```

Out[5]:

	country_name	maximum_debt
	China	96218620835.699996948
	Brazil	90041840304.100006104
	Russian Federation	66589761833.5
	Turkey	51555031005.800003052
	South Asia	48756295898.199996948
	Least developed countries: UN classification	40160766261.599998474
	IDA only	34531188113.199996948
	India	31923507000.799999237
	Indonesia	30916112653.799999237
	Kazakhstan	27482093686.400001526

In this notebook, we took a look at debt owed by countries across the globe. We extracted a few summary statistics from the data and unraveled some interesting facts and figures. We also validated our findings to make sure the investigations are correct.

Now we can answer the questions listed at the beginning of the notebook

- What is the total amount of debt that is owed by the countries listed in the dataset?
More than 3 million million USD
- Which country owes the maximum amount of debt and what does that amount look like?
China owes the maximum amount of debt and the amount is 285793494734.20
- What is the average amount of debt owed by countries across different debt indicators?
Refer to result in Section 6 of the notebook