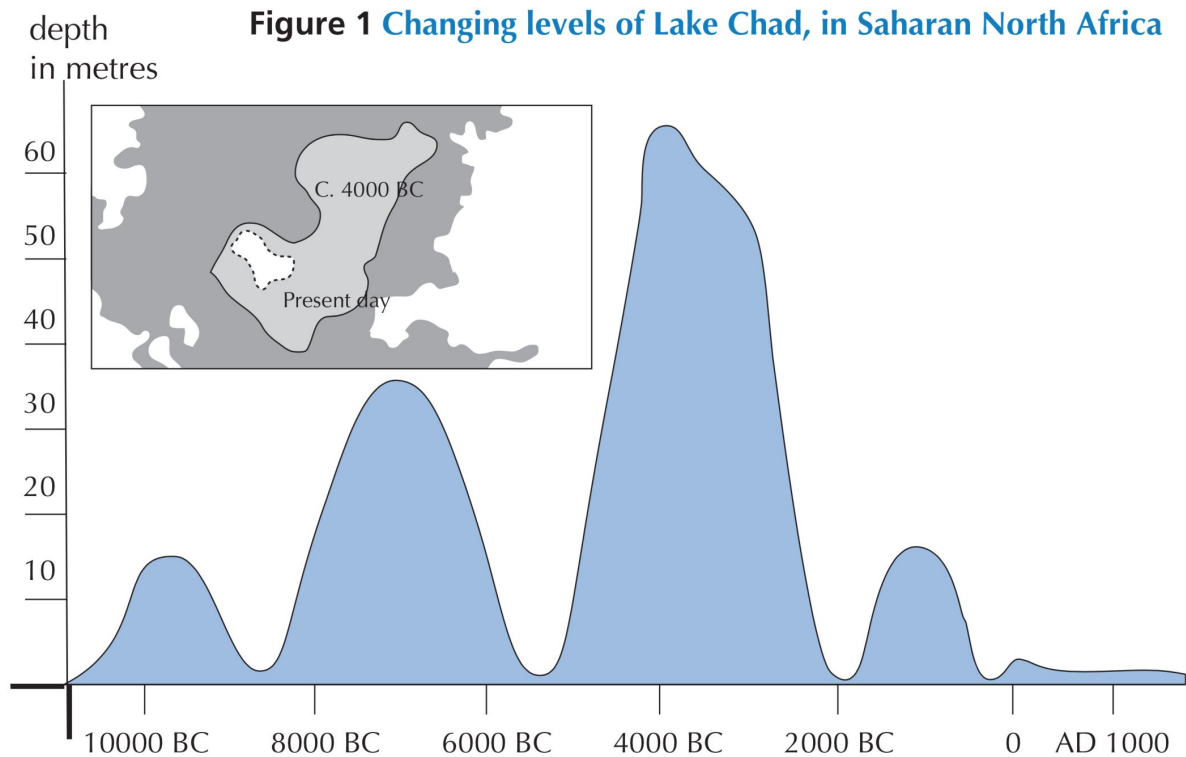# THE QA

- Combine visual and textual understanding.
  - Visual recognition
  - Natural language processing
  - Knowledge representation
- Dataset creation
- Baseline model

Example

Figure 1 shows changing levels of Lake Chad, in Saharan North Africa. Lake Chad disappeared completely in about 20,000 BC, during the last Ice Age. In about 11,000 BC it reappeared. **Today**, its level is **about the same** as it was in AD 1000.

Figure 1 Changing levels of Lake Chad, in Saharan North Africa

depth in metres

C. 4000 BC

Present day

10000 BC   8000 BC   6000 BC   4000 BC   2000 BC   0   AD 1000

What is the depth of Lake Chad **today**?

A. About two metres.   B. About fifteen metres.   C. About fifty metres.
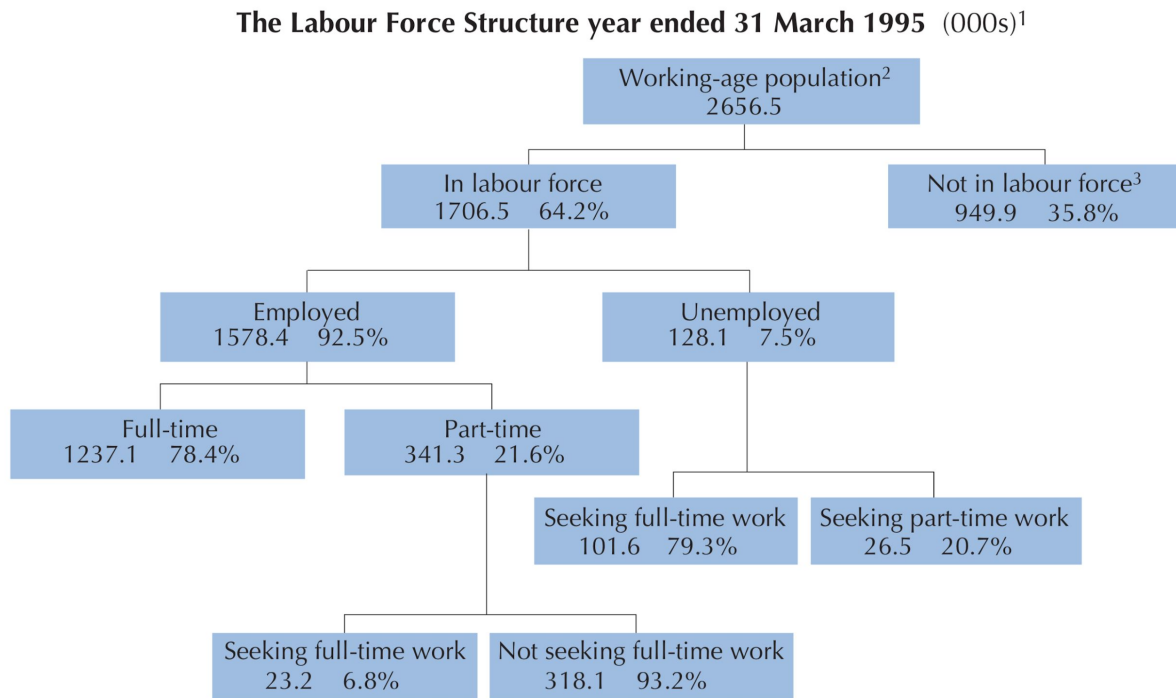D. It has disappeared completely.   E. The information is not provided.

Example

The **tree** diagram below shows the structure of a country's labour force or "working-age population".

The **total population** of the country in 1995 was about 3.4 million.

The Labour Force Structure year ended 31 March 1995 (000s)[1]

Working-age population[2]
2656.5

In labour force
1706.5   64.2%

Not in labour force[3]
949.9   35.8%

Employed
1578.4   92.5%

Unemployed
128.1   7.5%

Full-time
1237.1   78.4%

Part-time
341.3   21.6%

Seeking full-time work
101.6   79.3%

Seeking part-time work
26.5   20.7%

Seeking full-time work
23.2   6.8%

Not seeking full-time work
318.1   93.2%

In which part, a business woman, aged 43, who works a **sixty- hour week**, would be included?

A. **Labor force "employed"**   B. Labor force "unemployed"
C. Not in labor force   D. Not included in any category

Example

The following table shows the recommended Zedland **shoe sizes** corresponding to various **foot lengths**.

Marina's **feet** are 163 mm long. Use the table to determine which Zedland **shoe size** Marina should try on.

A. 22
B. 24
C. 26
D. 28

Conversion table for kids shoe sizes in Zedland

From (in mm)	To (in mm)	Shoe size
107	115	18
116	122	19
123	128	20
129	134	21
135	139	22
140	146	23
147	152	24
153	159	25
160	166	26
167	172	27
173	179	28
180	186	29
187	192	30

Data Source

Data Flavor - Time Series

- gdp-purchasing-power-parity
- gdp-real-growth-rate
- gdp-per-capita-**ppp**
- gross-national-saving
- unemployment-rate
- distribution-of-family-income-**gini-index**
- public-debt
- inflation-rate-consumer-prices
- central-bank-discount-rate
- commercial-bank-**prime-lending-rate**
- stock-of-**narrow**-money
- stock-of-**broad**-money

- stock-of-domestic-credit
- market-value-of-publicly-traded-shares
- market-value-of-publicly-traded-shares
- current-account-balance
- exports
- imports
- reserves-of-foreign-exchange-and-gold
- debt-external
- stock-of-direct-foreign-investment-at-home
- stock-of-direct-foreign-investment-abroad
- exchange-rates
- military-expenditures

Data Flavor - Categorical (finite labels)

- map-references
- exports-commodities
- imports-commodities
- agriculture-products
- industries
- natural-resources

Data Flavor - Comparative (across countries)

- **Industrial production growth rate**
- GDP - composition
- Natural gas - production
- Airports total
- Population
- Telephones - mobile cellular subscriptions per 100 inhabitants
- Telephones - **fixed lines** total subscriptions
- Labor force
- Labor force - by occupation agriculture
- Natural gas - consumption
- Natural gas - exports
- Electricity - from nuclear fuels
- Electricity - from hydroelectric plants
- Carbon dioxide emissions from consumption of energy
- Area land

- Electricity - production
- Electricity - consumption
- Electricity access electrification - total population
- Electricity - installed generating capacity
- Electricity - from fossil fuels
- Electricity - exports
- Electricity - imports
- Population growth rate
- Roadways total
- Refined petroleum products - imports
- Birth rate
- Merchant marine total
- Irrigated land
- Land use agricultural land
- Death rate
- Net **migration** rate

Scrapy

Scrapy - Time Series

```json
{
    "United States": {
        "_x_": [],
        "military-expenditures": [
            ["(2016)", "3.29% of GDP"],
            ["(2015)", "3.3% of GDP"],
            ["(2014)", "3.51% of GDP"],
            ["(2013)", "3.83% of GDP"],
            ["(2012)", "4.24% of GDP"]
        ],
        "_y_": []
    }
}
```

Scrapy - Categorical
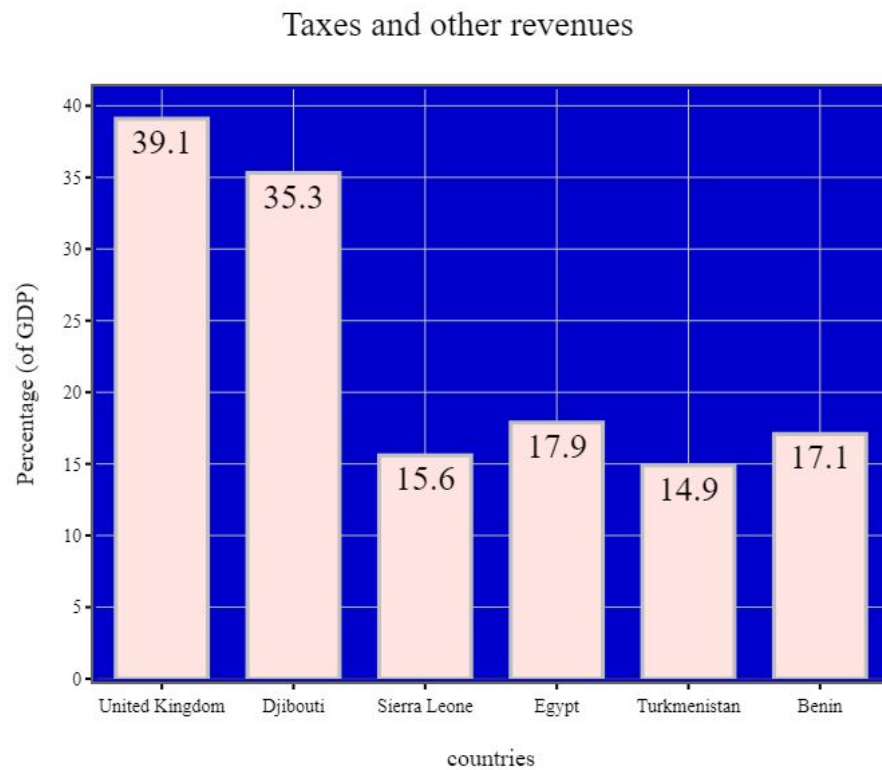
```json
{
    "Canada": {
        "_x_": [],
        "agriculture-products": ["wheat", "barley", "tobacco", "fruits", "vegetables", "dairy products", "fish"],
        "_y_": []
    }
}
```

Scrapy - Comparative

```json
{
    "Population": {
        "_x_": {},
        "United States": "329,256,465",
        "Canada": "35,881,659",
        "Mexico": "125,959,205",
        "_y_": {}
    }
}
```
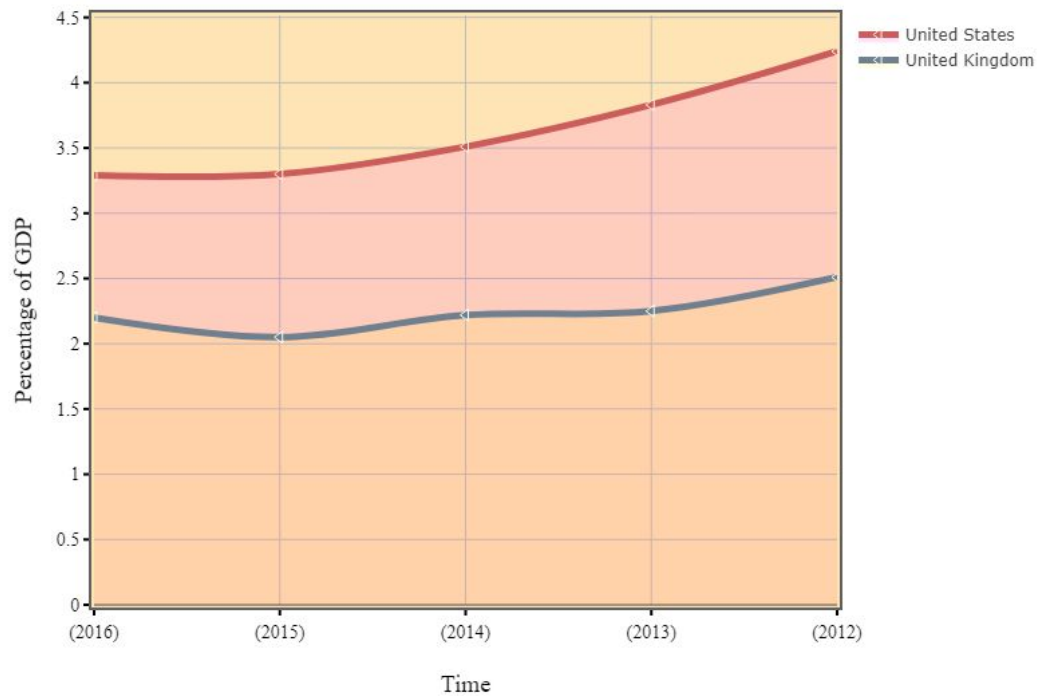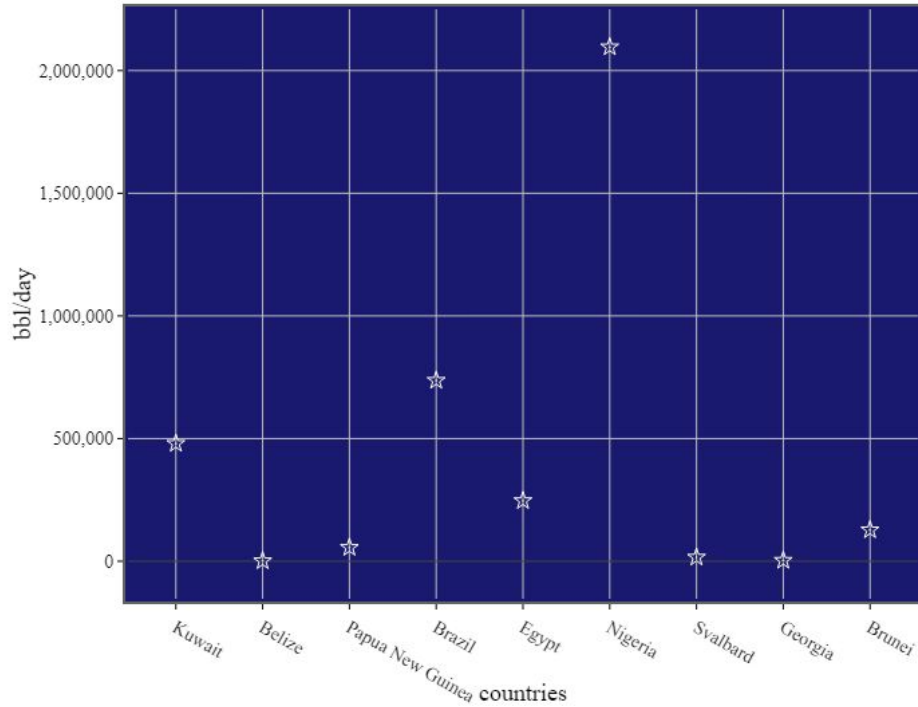
Plotly

Bar

Taxes and other revenues

Line/Area

military-expenditures

Scatter

Crude oil - exports

Pie

Obesity - adult prevalence rate

Vanuatu 25.2
Estonia 21.2
Iraq 30.4
Slovakia 20.5
Somalia 8.3
Austria 20.1

- Iraq
- Vanuatu
- Estonia
- Slovakia
- Austria
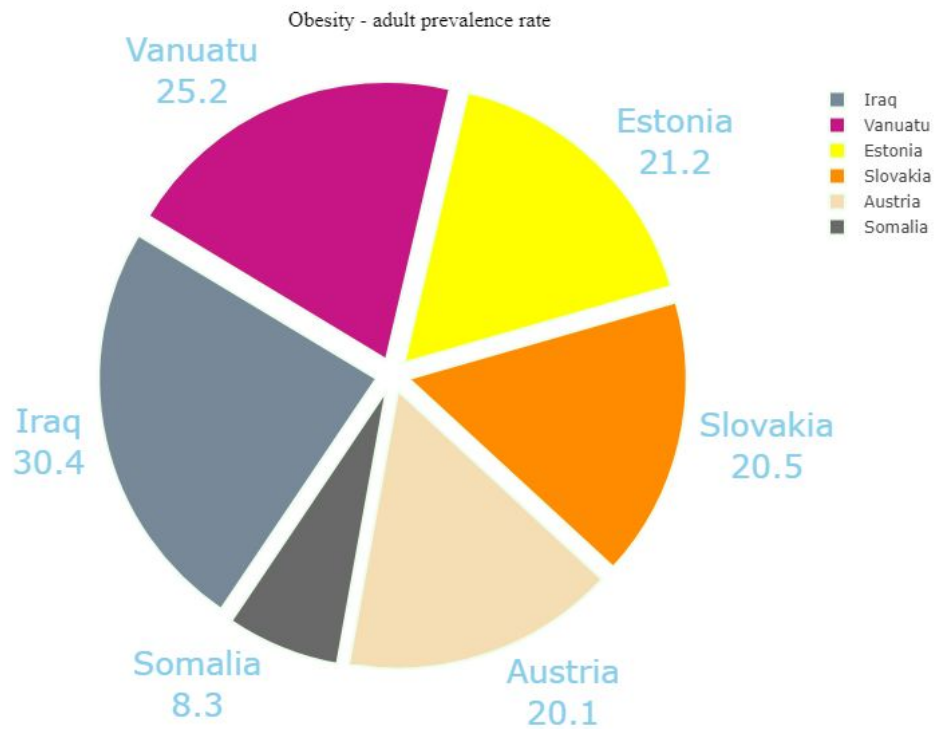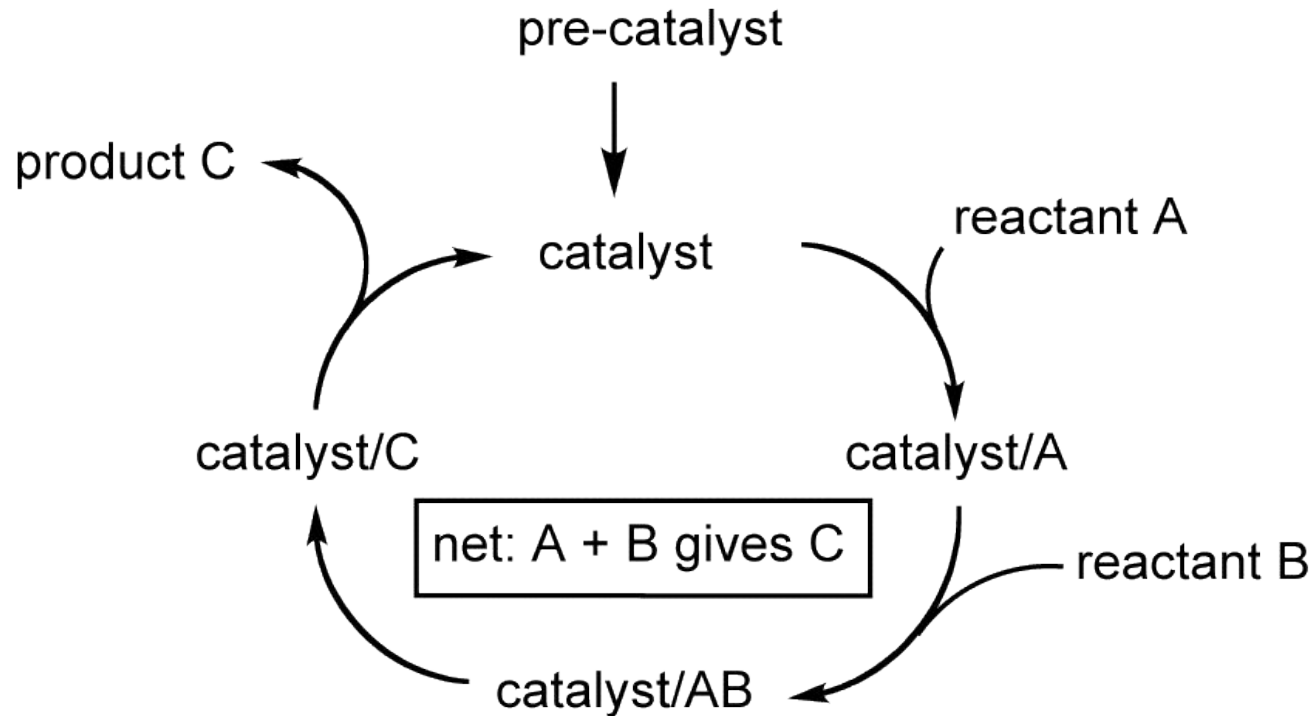- Somalia

Graph

Common Sense Knowledge

- Quantitative
- Temporal
- Tightly coupled with the data

CSK Terms

Question 1

Which of these countries is **most likely** to have a **rapid inflation** when compared to Pakistan?

A. India
B. Vietnam
C. Sri Lanka
D. Indonesia

Industrial production growth rate for the year 2017

Figure 1 shows the industrial production growth rate for various countries in the year of 2017. Industrial production figures are used by central banks to measure inflation, as **high levels of industrial production can lead to uncontrolled levels of consumption and rapid inflation**. In 2017, the industrial production growth rate of India was **similar** to that of Pakistan.

Question 2

The industrial production growth rate of Pakistan is **almost equal** to

A. 7.5
B. 6.5
C. 5.5
D. 4.5

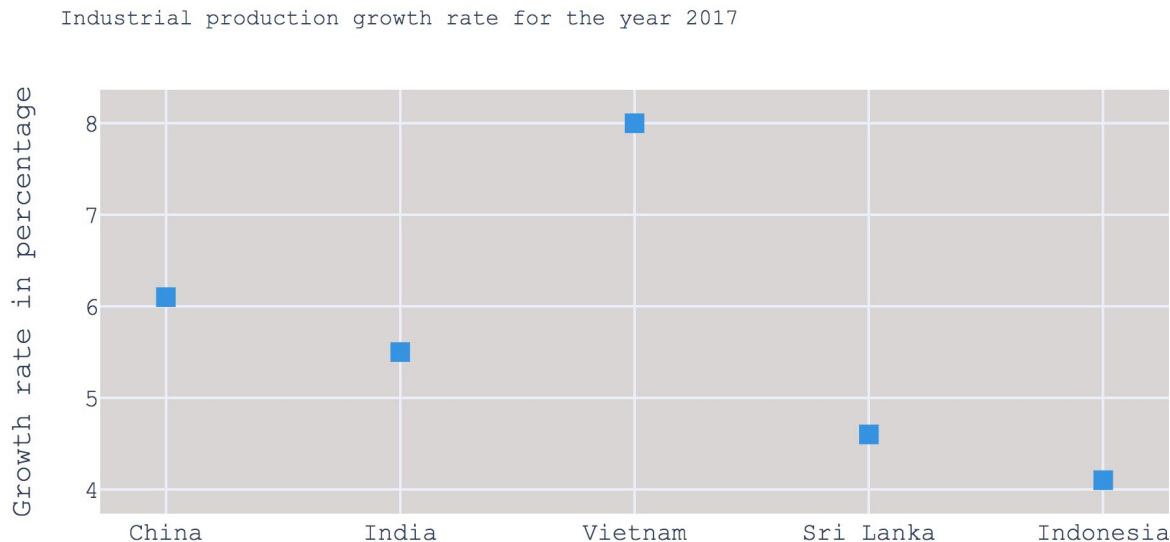Industrial production growth rate for the year 2017

Figure 1 shows the industrial production growth rate for various countries in the year of 2017. Industrial production figures are used by central banks to measure inflation, as high levels of industrial production can lead to uncontrolled levels of consumption and rapid inflation. In 2017, the industrial production growth rate of India was **similar** to that of Pakistan.

Question 3

Consider all the given 6 countries. The industrial production growth rate of Sri Lanka is **less than** how many countries

A. 1
B. 2
C. 3
D. 4

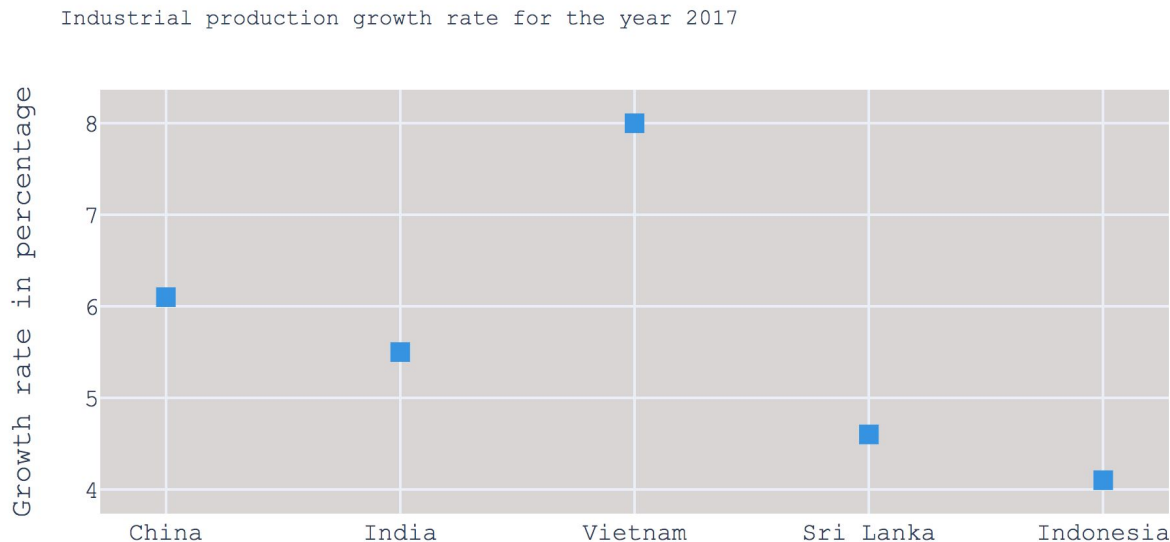Industrial production growth rate for the year 2017
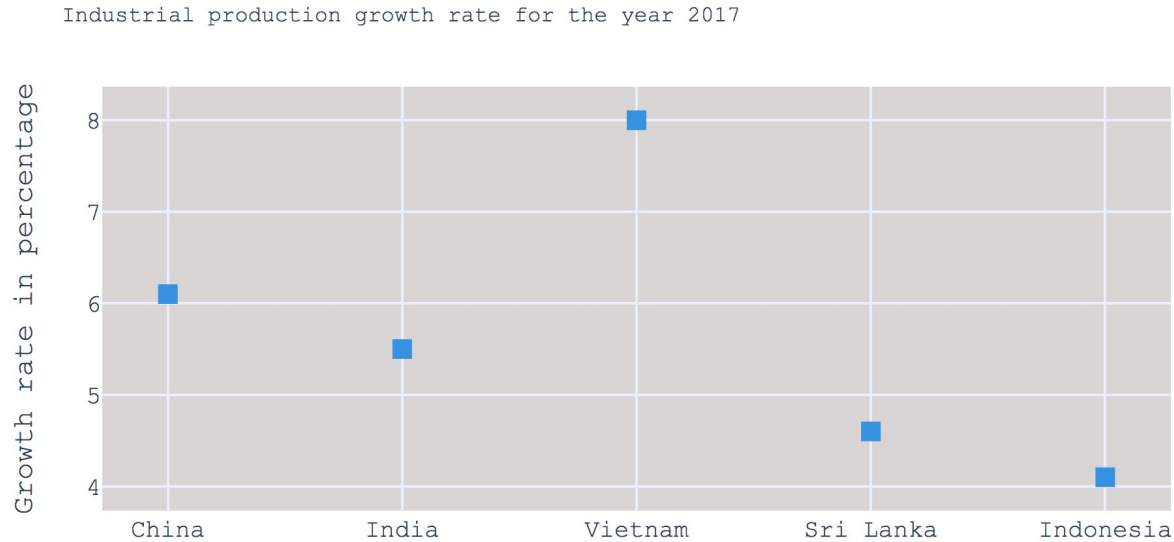

Figure 1 shows the industrial production growth rate for various countries in the year of 2017. Industrial production figures are used by central banks to measure inflation, as high levels of industrial production can lead to uncontrolled levels of consumption and rapid inflation. In 2017, the industrial production growth rate of India was **similar** to that of Pakistan.

Question 4

Which country is most likely to **import** Fish?

A. Canada
B. Argentina
C. Germany
D. India

	Canada	Argentina	Germany	India
Wheat	Y	Y	Y	Y
Barley	Y	N	Y	N
Tea	N	Y	N	Y
Potatoes	N	N	Y	Y
Fish	Y	Y	N	Y
Tobacco	Y	Y	N	N

The agricultural **produce** of various countries is depicted in Figure 2. Y indicates Yes, N indicates No.

Question 5

Tea, Potatoes and Coffee **thrive** well in **tropical climate**. Which country produces coffee?

A. Canada
B. Argentina
C. Germany
D. India

	Canada	Argentina	Germany	India
Wheat	Y	Y	Y	Y
Barley	Y	N	Y	N
Tea	N	Y	N	Y
Potatoes	N	N	Y	Y
Fish	Y	Y	N	Y
Tobacco	Y	Y	N	N

The agricultural **produce** of various countries is depicted in Figure 2. Y indicates Yes, N indicates No.

Question 6

Countries which produce fish have a **coastline**. Which country is **landlocked**?
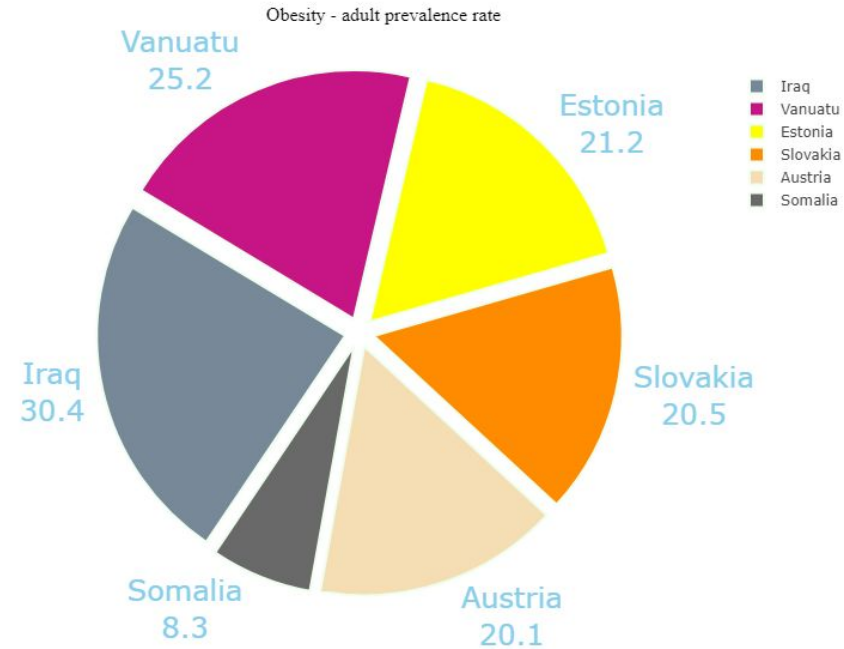
A. Canada
B. Argentina
C. Germany
D. India

	Canada	Argentina	Germany	India
Wheat	Y	Y	Y	Y
Barley	Y	N	Y	N
Tea	N	Y	N	Y
Potatoes	N	N	Y	Y
Fish	Y	Y	N	Y
Tobacco	Y	Y	N	N

The agricultural **produce** of various countries is depicted in Figure 2. Y indicates Yes, N indicates No.

Question 7

Which country has more number of people with higher BMI?

A. Iraq
B. Estonia
C. Somalia
D. Austria

Obesity - adult prevalence rate

- Iraq
- Vanuatu
- Estonia
- Slovakia
- Austria
- Somalia

Vanuatu 25.2
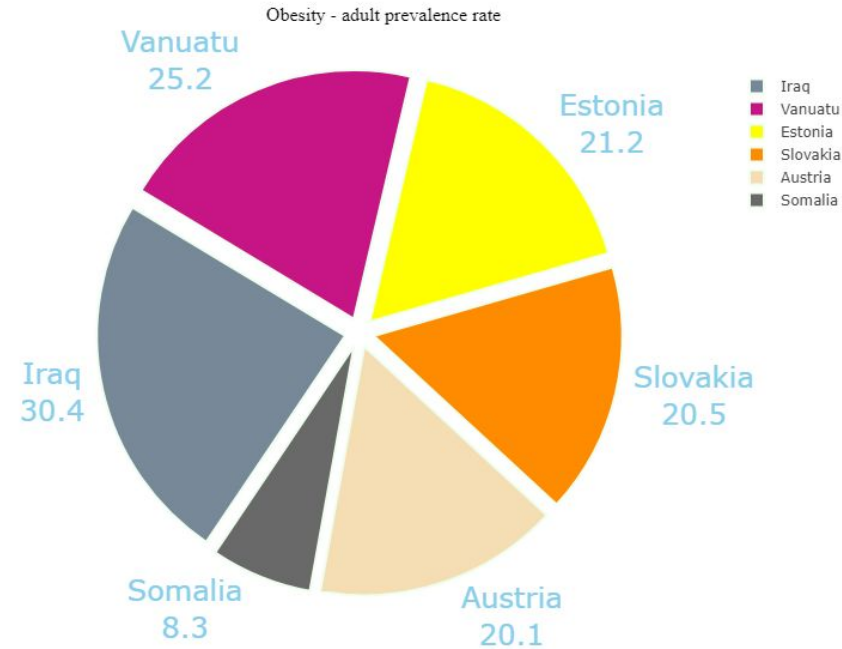Estonia 21.2
Iraq 30.4
Slovakia 20.5
Somalia 8.3
Austria 20.1

BMI is a measure of a person's weight in relationship to height. Obesity refers to excessive body fat. For most adults, BMI is strongly correlated with total body fat, and serves as a good surrogate measure for obesity. The Pie chart shows the percentage of people who are suffering from obesity in different countries.Population of Estonia is 8.3M, Iraq 5.6M, Slovakia 9.6M,Austria 10.5M , Somalia is 14.74 M and Vanuata is 7.8M.

Question 8

By inferring from graph and information , what is the relation between population of the country and percentage of its obesity people.

A. Directly proportional
B. Indirectly proportional
C. Cannot be determined
D. None of the above

Obesity - adult prevalence rate

- Iraq
- Vanuatu
- Estonia
- Slovakia
- Austria
- Somalia

Vanuatu 25.2
Estonia 21.2
Iraq 30.4
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BMI is a measure of a person's weight in relationship to height. Obesity refers to excessive body fat. For most adults, BMI is strongly correlated with total body fat, and serves as a good surrogate measure for obesity. The Pie chart shows the percentage of people who are suffering from obesity in different countries.Population of Estonia is 8.3M, Iraq 5.6M, Slovakia 9.6M,Austria 10.5M , Somalia is 14.74 M and Vanuata is 7.8M.

Future Work

- Identify more common sense relations
- Explore other datasets - not specific to a country's metrics
- Template based question generation - partly manual
- Wikipedia for "state-cycle" images