Lab 2.1 Learning How to Clean and Preprocess Data

1. Import pandas

In [1]:

```
import pandas as pd
```

2. Load the Lab 2.1 Data.xlsx file

In [2]:

```
df = pd.read_excel('Lab 2.1 Data.xlsx')
df.head()
```

Out[2]:

	Column1	Series-Id	Year	The Value	period	METRIC	URL
0	1	1999	SUUR0000SAE1	"100.0"	M12	Chained CPI - Education	https://data.bls.gov/cgi-bin/surveymost?su
1	2	2000	SUUR0000SAE1	"100.6"	M01	Chained CPI - Education	https://data.bls.gov/cgi-bin/surveymost?su
2	3	2000	SUUR0000SAE1	"100.9"	M02	Chained CPI - Education	https://data.bls.gov/cgi-bin/surveymost?su
3	4	2000	SUUR0000SAE1	"101.0"	M03	Chained CPI - Education	https://data.bls.gov/cgi-bin/surveymost?su
4	5	2000	SUUR0000SAE1	"101.1"	M04	Chained CPI - Education	https://data.bls.gov/cgi-bin/surveymost?su

3. Clean up columns

- Rename the **Series-Id** column to **Year**
- Rename the **Year** column to **SeriesId**
- Rename the **The Value** column to **Value**
- Rename the **METRIC** column to **Metric**
- Remove the columns: **Column1**, **SeriesId**, and **URL**

In [3]:

```
df = (df
      .loc[:,'Series-Id':'METRIC']
     .rename(columns={'Series-Id': 'Year',
                           'Year': 'SeriesId',
                           'period': 'Period',
                          'METRIC': 'Metric',
                          'The Value': 'Value'})
         .drop(columns='SeriesId')
        )
df.head()
```

Out[3]:

	Year	Value	Period	Metric
0	1999	"100.0"	M12	Chained CPI - Education
1	2000	"100.6"	M01	Chained CPI - Education
2	2000	"100.9"	M02	Chained CPI - Education
3	2000	"101.0"	M03	Chained CPI - Education
4	2000	"101.1"	M04	Chained CPI - Education

4. Convert the Value column to a numeric data type

In [4]:

```
df.Value = pd.to_numeric(df.Value.str.strip('"'))
df.head()
```

Out[4]:

	Year	Value	Period	Metric
0	1999	100.0	M12	Chained CPI - Education
1	2000	100.6	M01	Chained CPI - Education
2	2000	100.9	M02	Chained CPI - Education
3	2000	101.0	M03	Chained CPI - Education
4	2000	101.1	M04	Chained CPI - Education

5. Remove duplicate rows

In [5]:

```
df = df.drop_duplicates()
```

6. Create a new column, Month

The new **Month** column should represnt the values on the first day of the corresponding month.

In [6]:

```
df['Month'] = df.Year.astype(str) + df.Period.str.replace('M', '-') + '-01'
df.Month = pd.to_datetime(df.Month)
df.head()
```

Out[6]:

```
   Year  Value  Period                 Metric       Month
0  1999  100.0     M12  Chained CPI - Education  1999-12-01
1  2000  100.6     M01  Chained CPI - Education  2000-01-01
2  2000  100.9     M02  Chained CPI - Education  2000-02-01
3  2000  101.0     M03  Chained CPI - Education  2000-03-01
4  2000  101.1     M04  Chained CPI - Education  2000-04-01
```

7. Keep only Month, Metric, and Value

In [7]:

```
df = df[['Month', 'Metric', 'Value']]
df.head()
```

Out[7]:

```
        Month                   Metric  Value
0  1999-12-01  Chained CPI - Education  100.0
1  2000-01-01  Chained CPI - Education  100.6
2  2000-02-01  Chained CPI - Education  100.9
3  2000-03-01  Chained CPI - Education  101.0
4  2000-04-01  Chained CPI - Education  101.1
```

8. Pivot the data to a wide format

Specificlaly, create a column for each of the values in the **Metric** column, and fill in the cells with the values from the **Value** column.

In [9]:

```
dfw = df.pivot(index='Month', columns='Metric', values='Value')
dfw.head()
```

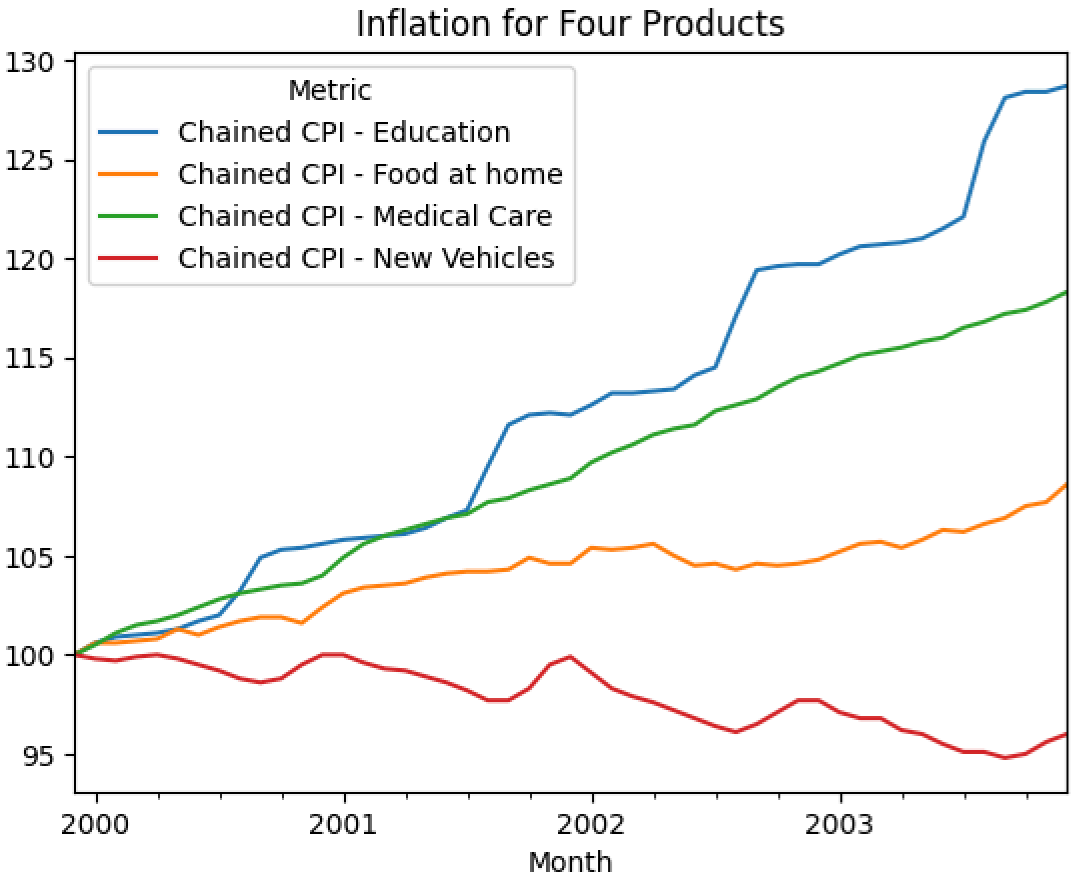
Out[9]:

Metric	Chained CPI - Education	Chained CPI - Food at home	Chained CPI - Medical Care	Chained CPI - New Vehicles
Month				
1999-12-01	100.0	100.0	100.0	100.0
2000-01-01	100.6	100.6	100.5	99.8
2000-02-01	100.9	100.6	101.1	99.7
2000-03-01	101.0	100.7	101.5	99.9
2000-04-01	101.1	100.8	101.7	100.0

9. Create a multiline plot

In [11]:

```python
dfw.plot.line(title = 'Inflation for Four Products');
```


Inflation for Four Products
Metric
Chained CPI - Education
Chained CPI - Food at home
Chained CPI - Medical Care
Chained CPI - New Vehicles
Month