Data Input and Output

This notebook is the reference code for getting input and output, pandas can read a variety of file types using its pd.read_ methods. Let's take a look at the most common data types:

In [1]:

```python
import numpy as np
import pandas as pd
```

CSV

CSV Input

In [25]:

```python
df = pd.read_csv('example')
df
```

Out[25]:

	a	b	c	d
0	0	1	2	3
1	4	5	6	7
2	8	9	10	11
3	12	13	14	15

CSV Output

In [24]:

```python
df.to_csv('example',index=False)
```

Excel

Pandas can read and write excel files, keep in mind, this only imports data. Not formulas or images, having images or macros may cause this read_excel method to crash.

Excel Input

```
pd.read_excel('Excel_Sample.xlsx',sheetname='Sheet1')
```

Out[35]:

	a	b	c	d
0	0	1	2	3
1	4	5	6	7
2	8	9	10	11
3	12	13	14	15

Excel Output

In [33]:

```
df.to_excel('Excel_Sample.xlsx',sheet_name='Sheet1')
```

HTML

You may need to install htmllib5,lxml, and BeautifulSoup4. In your terminal/command prompt run:

```
conda install lxml
conda install html5lib
conda install BeautifulSoup4
```

Then restart Jupyter Notebook. (or use pip install if you aren't using the Anaconda Distribution)

Pandas can read table tabs off of html. For example:

HTML Input

Pandas read_html function will read tables off of a webpage and return a list of DataFrame objects:

In [5]:

```
df = pd.read_html('http://www.fdic.gov/bank/individual/failed/banklist.html')
```

```
df[0]
```

	Bank Name	City	ST	CERT	Acquiring Institution	Closing Date	Updated Date	Loss Share Type	
0	First CornerStone Bank	King of Prussia	PA	35312	First-Citizens Bank & Trust Company	May 6, 2016	July 12, 2016	none	
1	Trust Company Bank	Memphis	TN	9956	The Bank of Fayette County	April 29, 2016	August 4, 2016	none	
2	North Milwaukee State Bank	Milwaukee	WI	20364	First-Citizens Bank & Trust Company	March 11, 2016	June 16, 2016	none	
3	Hometown National Bank	Longview	WA	35156	Twin City Bank	October 2, 2015	April 13, 2016	none	
4	The Bank of Georgia	Peachtree City	GA	35259	Fidelity Bank	October 2, 2015	April 13, 2016	none	
5	Premier Bank	Denver	CO	34112	United Fidelity Bank, fsb	July 10, 2015	July 12, 2016	none	
6	Edgebrook Bank	Chicago	IL	57772	Republic Bank of Chicago	May 8, 2015	July 12, 2016	none	
7	Doral BankEn Espanol	San Juan	PR	32102	Banco Popular de Puerto Rico	February 27, 2015	May 13, 2015	none	
8	Capitol City Bank & Trust Company	Atlanta	GA	33938	First-Citizens Bank & Trust Company	February 13, 2015	April 21, 2015	none	
9	Highland Community Bank	Chicago	IL	20290	United Fidelity Bank, fsb	January 23, 2015	April 21, 2015	none	
10	First National Bank of Crestview	Crestview	FL	17557	First NBC Bank	January 16, 2015	January 15, 2016	none	
11	Northern Star Bank	Mankato	MN	34983	BankVista	December 19, 2014	January 6, 2016	none	
12	Frontier Bank, FSB D/B/A El Paseo Bank	Palm Desert	CA	34738	Bank of Southern California, N.A.	November 7, 2014	January 6, 2016	none	
13	The National Republic Bank of Chicago	Chicago	IL	916	State Bank of Texas	October 24, 2014	January 6, 2016	none	
14	NBRS Financial	Rising Sun	MD	4862	Howard Bank	October 17, 2014	March 26, 2015	none	
15	GreenChoice Bank, fsb	Chicago	IL	28462	Providence Bank, LLC	July 25, 2014	July 28, 2015	none	
16	Eastside Commercial Bank	Conyers	GA	58125	Community & Southern Bank	July 18, 2014	July 11, 2016	none	
17	The Freedom State Bank	Freedom	OK	12483	Alva State Bank & Trust Company	June 27, 2014	March 25, 2016	none	
18	Valley Bank	Fort Lauderdale	FL	21793	Landmark Bank, National Association	June 20, 2014	June 29, 2015	none	

	Bank Name	City	ST	CERT	Acquiring Institution	Closing Date	Updated Date	Loss Share Type	
19	Valley Bank	Moline	IL	10450	Great Southern Bank	June 20, 2014	June 26, 2015	none	
20	Slavie Federal Savings Bank	Bel Air	MD	32368	Bay Bank, FSB	May 30, 2014	June 15, 2015	none	
21	Columbia Savings Bank	Cincinnati	OH	32284	United Fidelity Bank, fsb	May 23, 2014	May 28, 2015	none	
22	AztecAmerica Bank En Espanol	Berwyn	IL	57866	Republic Bank of Chicago	May 16, 2014	July 18, 2014	none	
23	Allendale County Bank	Fairfax	SC	15062	Palmetto State Bank	April 25, 2014	July 18, 2014	none	
24	Vantage Point Bank	Horsham	PA	58531	First Choice Bank	February 28, 2014	March 3, 2015	none	
25	Millennium Bank, National Association	Sterling	VA	35096	WashingtonFirst Bank	February 28, 2014	March 03, 2015	none	
26	Syringa Bank	Boise	ID	34296	Sunwest Bank	January 31, 2014	April 12, 2016	none	
27	The Bank of Union	El Reno	OK	17967	BancFirst	January 24, 2014	March 25, 2016	none	
28	DuPage National Bank	West Chicago	IL	5732	Republic Bank of Chicago	January 17, 2014	February 19, 2015	none	
29	Texas Community Bank, National Association	The Woodlands	TX	57431	Spirit of Texas Bank, SSB	December 13, 2013	December 29, 2014	none	
...	...	...	...	...	...	...	...	...	
515	ANB Financial, NA	Bentonville	AR	33901	Pulaski Bank and Trust Company	May 9, 2008	August 28, 2012	none	
516	Hume Bank	Hume	MO	1971	Security Bank	March 7, 2008	August 28, 2012	none	
517	Douglass National Bank	Kansas City	MO	24660	Liberty Bank and Trust Company	January 25, 2008	October 26, 2012	none	
518	Miami Valley Bank	Lakeview	OH	16848	The Citizens Banking Company	October 4, 2007	August 28, 2012	none	
519	NetBank	Alpharetta	GA	32575	ING DIRECT	September 28, 2007	August 28, 2012	none	
520	Metropolitan Savings Bank	Pittsburgh	PA	35353	Allegheny Valley Bank of Pittsburgh	February 2, 2007	October 27, 2010	none	
521	Bank of Ephraim	Ephraim	UT	1249	Far West Bank	June 25, 2004	April 9, 2008	none	
522	Reliance Bank	White Plains	NY	26778	Union State Bank	March 19, 2004	April 9, 2008	none	

	Bank Name	City	ST	CERT	Acquiring Institution	Closing Date	Updated Date	Loss Share Type	
523	Guaranty National Bank of Tallahassee	Tallahassee	FL	26838	Hancock Bank of Florida	March 12, 2004	June 5, 2012	none	
524	Dollar Savings Bank	Newark	NJ	31330	No Acquirer	February 14, 2004	April 9, 2008	none	
525	Pulaski Savings Bank	Philadelphia	PA	27203	Earthstar Bank	November 14, 2003	July 22, 2005	none	
526	First National Bank of Blanchardville	Blanchardville	WI	11639	The Park Bank	May 9, 2003	June 5, 2012	none	
527	Southern Pacific Bank	Torrance	CA	27094	Beal Bank	February 7, 2003	October 20, 2008	none	
528	Farmers Bank of Cheneyville	Cheneyville	LA	16445	Sabine State Bank & Trust	December 17, 2002	October 20, 2004	none	
529	Bank of Alamo	Alamo	TN	9961	No Acquirer	November 8, 2002	March 18, 2005	none	
530	AmTrade International BankEn Espanol	Atlanta	GA	33784	No Acquirer	September 30, 2002	September 11, 2006	none	
531	Universal Federal Savings Bank	Chicago	IL	29355	Chicago Community Bank	June 27, 2002	April 9, 2008	none	
532	Connecticut Bank of Commerce	Stamford	CT	19183	Hudson United Bank	June 26, 2002	February 14, 2012	none	
533	New Century Bank	Shelby Township	MI	34979	No Acquirer	March 28, 2002	March 18, 2005	none	
534	Net 1st National Bank	Boca Raton	FL	26652	Bank Leumi USA	March 1, 2002	April 9, 2008	none	
535	NextBank, NA	Phoenix	AZ	22314	No Acquirer	February 7, 2002	February 5, 2015	none	
536	Oakwood Deposit Bank Co.	Oakwood	OH	8966	The State Bank & Trust Company	February 1, 2002	October 25, 2012	none	
537	Bank of Sierra Blanca	Sierra Blanca	TX	22002	The Security State Bank of Pecos	January 18, 2002	November 6, 2003	none	
538	Hamilton Bank, NAEn Espanol	Miami	FL	24382	Israel Discount Bank of New York	January 11, 2002	September 21, 2015	none	
539	Sinclair National Bank	Gravette	AR	34248	Delta Trust & Bank	September 7, 2001	February 10, 2004	none	
540	Superior Bank, FSB	Hinsdale	IL	32646	Superior Federal, FSB	July 27, 2001	August 19, 2014	none	
541	Malta National Bank	Malta	OH	6629	North Valley Bank	May 3, 2001	November 18, 2002	none	
542	First Alliance Bank & Trust Co.	Manchester	NH	34264	Southern New Hampshire Bank & Trust	February 2, 2001	February 18, 2003	none	

	Bank Name	City	ST	CERT	Acquiring Institution	Closing Date	Updated Date	Loss Share Type	
543	National State Bank of Metropolis	Metropolis	IL	3815	Banterra Bank of Marion	December 14, 2000	March 17, 2005	none	
544	Bank of Honolulu	Honolulu	HI	21029	Bank of the Orient	October 13, 2000	March 17, 2005	none	

545 rows × 10 columns

SQL (Optional)

- Note: If you are completely unfamiliar with SQL you can check out my other course: "Complete SQL Bootcamp" to learn SQL.

The pandas.io.sql module provides a collection of query wrappers to both facilitate data retrieval and to reduce dependency on DB-specific API. Database abstraction is provided by SQLAlchemy if installed. In addition you will need a driver library for your database. Examples of such drivers are psycopg2 for PostgreSQL or pymysql for MySQL. For SQLite this is included in Python's standard library by default. You can find an overview of supported drivers for each SQL dialect in the SQLAlchemy docs.

If SQLAlchemy is not installed, a fallback is only provided for sqlite (and for mysql for backwards compatibility, but this is deprecated and will be removed in a future version). This mode requires a Python database adapter which respect the Python DB-API.

See also some cookbook examples for some advanced strategies.

The key functions are:

- read_sql_table(table_name, con[, schema, ...])
  - Read SQL database table into a DataFrame.
- read_sql_query(sql, con[, index_col, ...])
  - Read SQL query into a DataFrame.
- read_sql(sql, con[, index_col, ...])
  - Read SQL query or database table into a DataFrame.
- DataFrame.to_sql(name, con[, flavor, ...])
  - Write records stored in a DataFrame to a SQL database.

In [36]:

```python
from sqlalchemy import create_engine
```

In [37]:

```python
engine = create_engine('sqlite:///:memory:')
```

In [40]:

```python
df.to_sql('data', engine)
```

In [42]:

```python
sql_df = pd.read_sql('data',con=engine)
```

In [43]:

```python
sql_df
```

Out[43]:

	index	a	b	c	d
0	0	0	1	2	3
1	1	4	5	6	7
2	2	8	9	10	11
3	3	12	13	14	15

Great Job!