

Modifying DataFrames in Pandas

Once again, we'll be working with data from ShoeFly.com, a fictional online shoe store.

```
In [1]: # Before we analyze anything, we need to import pandas
# and load our data
import pandas as pd

df = pd.read_csv('shoefly_orders.csv')
```

Let's examine the first 10 rows of our data!

```
In [2]: df.head(10)

Out[2]:
```

	id	first_name	last_name	email	shoe_type	shoe_material	shoe_color
0	74870	Albert	Crane	ACrane1998@gmail.com	ballet flats	fabric	white
1	28140	Lauren	Wise	LWise1972@gmail.com	sandals	fabric	black
2	18841	Bryan	Maldonado	Bryan.Maldonado@gmail.com	STILETTO	fabric	navy
3	19695	Nancy	Talley	NTalley1988@gmail.com	wedges	fabric	black
4	61287	Catherine	Brown	CBrown1981@gmail.com	boots	faux-leather	white
5	57141	Doris	Newton	DN6902@gmail.com	sandals	fabric	navy
6	52132	Billy	Montanye	BM6554@hotmail.com	wedges	faux-leather	navy
7	25486	Sarah	Kaufman	SK9430@gmail.com	sandals	leather	navy
8	12421	Susan	Leblanc	Susan.leblanc40@outlook.com	clogs	fabric	red
9	36234	Benjamin	Newton	BenjaminNewton59@aol.com	clogs	faux-leather	navy

Oh, no! It looks like our data entry was a little sloppy. Some of the shoe types are all caps, and others are all lower case. This is messy, and we'd like to clean it up. We can do this by applying `string.lower` to the column `shoe_type`.

```
In [3]: import string

df['shoe_type'] = df.shoe_type.apply(string.lower)

df.head(10)
```

```
Out[3]:
```

	id	first_name	last_name	email	shoe_type	shoe_material	shoe_color
0	74870	Albert	Crane	ACrane1998@gmail.com	ballet flats	fabric	white
1	28140	Lauren	Wise	LWise1972@gmail.com	sandals	fabric	black
2	18841	Bryan	Maldonado	Bryan.Maldonado@gmail.com	stiletos	fabric	navy
3	19695	Nancy	Talley	NTalley1988@gmail.com	wedges	fabric	black
4	61287	Catherine	Brown	CBrown1981@gmail.com	boots	faux-leather	white
5	57141	Doris	Newton	DN6902@gmail.com	sandals	fabric	navy
6	52132	Billy	Montanye	BM6554@hotmail.com	wedges	faux-leather	navy
7	25486	Sarah	Kaufman	SK9430@gmail.com	sandals	leather	navy
8	12421	Susan	Leblanc	Susan.leblanc40@outlook.com	clogs	fabric	red
9	36234	Benjamin	Newton	BenjaminNewton59@aol.com	clogs	faux-leather	navy

Much better! Now all of the fields are lower case.

Our factory says that they are not able to stock fabric shoes anymore. Let's add a column `in_stock`, which is `True` for all non-fabric shoes and `False` for fabric shoes.

```
In [4]: df['in_stock'] = df.shoe_material.apply(lambda x: False if x == 'fabric' else True)

df.head(10)
```

```
Out[4]:
```

	id	first_name	last_name	email	shoe_type	shoe_material	shoe_color	in_stock
0	74870	Albert	Crane	ACrane1998@gmail.com	ballet flats	fabric	white	False
1	28140	Lauren	Wise	LWise1972@gmail.com	sandals	fabric	black	False
2	18841	Bryan	Maldonado	Bryan.Maldonado@gmail.com	stiletos	fabric	navy	False
3	19695	Nancy	Talley	NTalley1988@gmail.com	wedges	fabric	black	False
4	61287	Catherine	Brown	CBrown1981@gmail.com	boots	faux-leather	white	True
5	57141	Doris	Newton	DN6902@gmail.com	sandals	fabric	navy	False
6	52132	Billy	Montanye	BM6554@hotmail.com	wedges	faux-leather	navy	True
7	25486	Sarah	Kaufman	SK9430@gmail.com	sandals	leather	navy	True
8	12421	Susan	Leblanc	Susan.leblanc40@outlook.com	clogs	fabric	red	False
9	36234	Benjamin	Newton	BenjaminNewton59@aol.com	clogs	faux-leather	navy	True

Our marketing department wants to announce some purchases on our Twitter feed.

Let's add a description to each row that they can use. It will show up in a new column called `'description'`.

```
In [5]: df['description'] = df.apply(lambda row: "{ } bought { } { }".format(row.first_name, row.last_name, row.shoe_color, row.shoe_material, row.shoe_type), axis=1)

df.head(10)
```

```
Out[5]:
```

	id	first_name	last_name	email	shoe_type	shoe_material	shoe_color	in_stock	description
0	74870	Albert	Crane	ACrane1998@gmail.com	ballet flats	fabric	white	False	Albert Crane bought white fabric ballet flats
1	28140	Lauren	Wise	LWise1972@gmail.com	sandals	fabric	black	False	Lauren Wise bought black fabric sandals
2	18841	Bryan	Maldonado	Bryan.Maldonado@gmail.com	stiletos	fabric	navy	False	Bryan Maldonado bought navy fabric stiletos
3	19695	Nancy	Talley	NTalley1988@gmail.com	wedges	fabric	black	False	Nancy Talley bought black fabric wedges
4	61287	Catherine	Brown	CBrown1981@gmail.com	boots	faux-leather	white	True	Catherine Brown bought white faux-leather boots
5	57141	Doris	Newton	DN6902@gmail.com	sandals	fabric	navy	False	Doris Newton bought navy fabric sandals
6	52132	Billy	Montanye	BM6554@hotmail.com	wedges	faux-leather	navy	True	Billy Montanye bought navy faux-leather wedges
7	25486	Sarah	Kaufman	SK9430@gmail.com	sandals	leather	navy	True	Sarah Kaufman bought navy leather sandals
8	12421	Susan	Leblanc	Susan.leblanc40@outlook.com	clogs	fabric	red	False	Susan Leblanc bought red fabric clogs
9	36234	Benjamin	Newton	BenjaminNewton59@aol.com	clogs	faux-leather	navy	True	Benjamin Newton bought navy faux-leather clogs