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Row level transformations using map

Let us understand how we can perform row level transformations using `map`. Here are some of the examples.

- Derive new fields from existing fields.
- Get last 4 digits of social security number.
- Standardize phone numbers.
- Convert names to lower or upper case.
- Break down the address into street, city, state, zip code.
- Encrypt confidential information such as social security number or other unique ids such as Aadhaar.

```
%run 02_preparing_data_sets.ipynb
```

```
orders[:10]
```

```
['1,2013-07-25 00:00:00.0,11599,CLOSED',
 '2,2013-07-25 00:00:00.0,256,PENDING_PAYMENT',
 '3,2013-07-25 00:00:00.0,12111,COMPLETE',
 '4,2013-07-25 00:00:00.0,8827,CLOSED',
 '5,2013-07-25 00:00:00.0,11318,COMPLETE',
 '6,2013-07-25 00:00:00.0,7130,COMPLETE',
 '7,2013-07-25 00:00:00.0,4530,COMPLETE',
 '8,2013-07-25 00:00:00.0,2911,PROCESSING',
 '9,2013-07-25 00:00:00.0,5657,PENDING_PAYMENT',
 '10,2013-07-25 00:00:00.0,5648,PENDING_PAYMENT']
```

```
len(orders)
```

```
68883
```

```
order_items[:10]
```

```
['1,1,957,1,299.98,299.98',
 '2,2,1073,1,199.99,199.99',
 '3,2,502,5,250.0,50.0',
 '4,2,403,1,129.99,129.99',
 '5,4,897,2,49.98,24.99',
 '6,4,365,5,299.95,59.99',
 '7,4,502,3,150.0,50.0',
 '8,4,1014,4,199.92,49.98',
 '9,5,957,1,299.98,299.98',
 '10,5,365,5,299.95,59.99']
```

```
len(order_items)
```

```
172198
```

Task 1

Get day name of each date in our orders data set. Output should be tuple with 3 elements.

- order_id of type integer
- order_date of type string
- order_day_name of type string

```
import datetime as dt
d = dt.datetime.strptime('2013-07-25 00:00:00.0'.split(' ')[0], '%Y-%m-%d')
```

```
d
```

```
datetime.datetime(2013, 7, 25, 0, 0)
```

```python
d.weekday()
```

```
3
```

```python
import calendar
```

```python
list(calendar.day_name)
```

```
['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday']
```

```python
calendar.day_name[d.weekday()]
```

```
'Thursday'
```

```python
import datetime as dt, calendar as c

order = '1,2013-07-25 00:00:00.0,11599,CLOSED'
```

```python
order.split(',')[1].split(' ')[0]
```

```
'2013-07-25'
```

```python
dt.datetime.strptime(order.split(',')[1].split(' ')[0], '%Y-%m-%d')
```

```
datetime.datetime(2013, 7, 25, 0, 0)
```

```python
dt.datetime.strptime(order.split(',')[1].split(' ')[0], '%Y-%m-%d').weekday()
```

```
3
```

```python
c.day_name[dt.datetime.strptime(order.split(',')[1].split(' ')[0], '%Y-%m-%d').weekday()]
```

```
'Thursday'
```

```python
import datetime as dt, calendar as c
order_dates = map(
    lambda order: c.day_name[dt.datetime.strptime(order.split(',')[1].split(' ')[0], '%Y-%m-
%d').weekday()],
    orders
)
```

```python
list(order_dates)[:10]
```

```
['Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday',
 'Thursday']
```

Note

We can use lambda function as long as we do not have assignment operations. However, we might end up compromising readability.

```python
import datetime as dt, calendar as c
order_dates = map(
    lambda order: (
        int(order.split(',')[0]),
        order.split(',')[1],
        c.day_name[dt.datetime.strptime(order.split(',')[1].split(' ')[0], '%Y-%m-
%d').weekday()]
    ),
    orders
)
```

```python
list(order_dates)[:10]
```

```
[(1, '2013-07-25 00:00:00.0', 'Thursday'),
 (2, '2013-07-25 00:00:00.0', 'Thursday'),
 (3, '2013-07-25 00:00:00.0', 'Thursday'),
 (4, '2013-07-25 00:00:00.0', 'Thursday'),
 (5, '2013-07-25 00:00:00.0', 'Thursday'),
 (6, '2013-07-25 00:00:00.0', 'Thursday'),
 (7, '2013-07-25 00:00:00.0', 'Thursday'),
 (8, '2013-07-25 00:00:00.0', 'Thursday'),
 (9, '2013-07-25 00:00:00.0', 'Thursday'),
 (10, '2013-07-25 00:00:00.0', 'Thursday')]
```

Note

Here is the example of implementation using named function.

```python
def get_order_date(order):
    order_details = order.split(',')
    order_id = int(order_details[0])
    order_date = order.split(',')[1]
    order_date_as_datetime = dt.datetime.strptime(order_date.split(' ')[0], '%Y-%m-%d')
    order_day_name = c.day_name[order_date_as_datetime.weekday()]
    return (order_id, order_date, order_day_name)
```

```python
order_dates = map(
    get_order_date,
    orders
)
```

```python
list(order_dates)[:10]
```

```
[(1, '2013-07-25 00:00:00.0', 'Thursday'),
 (2, '2013-07-25 00:00:00.0', 'Thursday'),
 (3, '2013-07-25 00:00:00.0', 'Thursday'),
 (4, '2013-07-25 00:00:00.0', 'Thursday'),
 (5, '2013-07-25 00:00:00.0', 'Thursday'),
 (6, '2013-07-25 00:00:00.0', 'Thursday'),
 (7, '2013-07-25 00:00:00.0', 'Thursday'),
 (8, '2013-07-25 00:00:00.0', 'Thursday'),
 (9, '2013-07-25 00:00:00.0', 'Thursday'),
 (10, '2013-07-25 00:00:00.0', 'Thursday')]
```

```python
order_dates = map(
    lambda order: get_order_date(order),
    orders
)
```

```python
list(order_dates)[:10]
```

```
[(1, '2013-07-25 00:00:00.0', 'Thursday'),
 (2, '2013-07-25 00:00:00.0', 'Thursday'),
 (3, '2013-07-25 00:00:00.0', 'Thursday'),
 (4, '2013-07-25 00:00:00.0', 'Thursday'),
 (5, '2013-07-25 00:00:00.0', 'Thursday'),
 (6, '2013-07-25 00:00:00.0', 'Thursday'),
 (7, '2013-07-25 00:00:00.0', 'Thursday'),
 (8, '2013-07-25 00:00:00.0', 'Thursday'),
 (9, '2013-07-25 00:00:00.0', 'Thursday'),
 (10, '2013-07-25 00:00:00.0', 'Thursday')]
```

Task 2

Add weekend flag for Saturday and Sunday dates.

```python
def get_order_date(order):
    order_details = order.split(',')
    order_id = int(order_details[0])
    order_date = order.split(',')[1]
    order_date_as_datetime = dt.datetime.strptime(order_date.split(' ')[0], '%Y-%m-%d')
    order_day_name = c.day_name[order_date_as_datetime.weekday()]
    weekend_flag = True if order_date_as_datetime.weekday() in (5, 6) else False
    return (order_id, order_date, order_day_name, weekend_flag)
```

```python
order_dates = map(
    get_order_date,
    orders
)
```

```python
list(order_dates)[:10]
```

```
[(1, '2013-07-25 00:00:00.0', 'Thursday', False),
 (2, '2013-07-25 00:00:00.0', 'Thursday', False),
 (3, '2013-07-25 00:00:00.0', 'Thursday', False),
 (4, '2013-07-25 00:00:00.0', 'Thursday', False),
 (5, '2013-07-25 00:00:00.0', 'Thursday', False),
 (6, '2013-07-25 00:00:00.0', 'Thursday', False),
 (7, '2013-07-25 00:00:00.0', 'Thursday', False),
 (8, '2013-07-25 00:00:00.0', 'Thursday', False),
 (9, '2013-07-25 00:00:00.0', 'Thursday', False),
 (10, '2013-07-25 00:00:00.0', 'Thursday', False)]
```

Note

Validate whether weekend_flag is generated properly or not.

```python
def get_order_date(order):
    order_details = order.split(',')
    order_id = int(order_details[0])
    order_date = order.split(',')[1]
    order_date_as_datetime = dt.datetime.strptime(order_date.split(' ')[0], '%Y-%m-%d')
    order_day_name = c.day_name[order_date_as_datetime.weekday()]
    weekend_flag = True if order_date_as_datetime.weekday() in (5, 6) else False
    return (order_id, order_date, order_day_name, weekend_flag)
```

```python
order_dates = map(
    get_order_date,
    orders
)
```

```python
order_dates_without_ids = map(
    lambda order: (order[1], order[2], order[3]),
    order_dates
)
```

```python
set(order_dates_without_ids)
```

```
{('2013-07-25 00:00:00.0', 'Thursday', False),
 ('2013-07-26 00:00:00.0', 'Friday', False),
 ('2013-07-27 00:00:00.0', 'Saturday', True),
 ('2013-07-28 00:00:00.0', 'Sunday', True),
 ('2013-07-29 00:00:00.0', 'Monday', False),
 ('2013-07-30 00:00:00.0', 'Tuesday', False),
 ('2013-07-31 00:00:00.0', 'Wednesday', False),
 ('2013-08-01 00:00:00.0', 'Thursday', False),
 ('2013-08-02 00:00:00.0', 'Friday', False),
 ('2013-08-03 00:00:00.0', 'Saturday', True),
 ('2013-08-04 00:00:00.0', 'Sunday', True),
 ('2013-08-05 00:00:00.0', 'Monday', False),
 ('2013-08-06 00:00:00.0', 'Tuesday', False),
 ('2013-08-07 00:00:00.0', 'Wednesday', False),
 ('2013-08-08 00:00:00.0', 'Thursday', False),
 ('2013-08-09 00:00:00.0', 'Friday', False),
 ('2013-08-10 00:00:00.0', 'Saturday', True),
 ('2013-08-11 00:00:00.0', 'Sunday', True),
 ('2013-08-12 00:00:00.0', 'Monday', False),
 ('2013-08-13 00:00:00.0', 'Tuesday', False),
 ('2013-08-14 00:00:00.0', 'Wednesday', False),
 ('2013-08-15 00:00:00.0', 'Thursday', False),
 ('2013-08-16 00:00:00.0', 'Friday', False),
 ('2013-08-17 00:00:00.0', 'Saturday', True),
 ('2013-08-18 00:00:00.0', 'Sunday', True),
 ('2013-08-19 00:00:00.0', 'Monday', False),
 ('2013-08-20 00:00:00.0', 'Tuesday', False),
 ('2013-08-21 00:00:00.0', 'Wednesday', False),
 ('2013-08-22 00:00:00.0', 'Thursday', False),
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 ('2013-08-24 00:00:00.0', 'Saturday', True),
 ('2013-08-25 00:00:00.0', 'Sunday', True),
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 ('2013-09-06 00:00:00.0', 'Friday', False),
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 ('2013-09-08 00:00:00.0', 'Sunday', True),
 ('2013-09-09 00:00:00.0', 'Monday', False),
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 ('2013-10-27 00:00:00.0', 'Sunday', True),
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 ('2013-12-07 00:00:00.0', 'Saturday', True),
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 ('2013-12-13 00:00:00.0', 'Friday', False),
 ('2013-12-14 00:00:00.0', 'Saturday', True),
 ('2013-12-15 00:00:00.0', 'Sunday', True),
 ('2013-12-16 00:00:00.0', 'Monday', False),
 ('2013-12-17 00:00:00.0', 'Tuesday', False),
 ('2013-12-18 00:00:00.0', 'Wednesday', False),
 ('2013-12-19 00:00:00.0', 'Thursday', False),
 ('2013-12-20 00:00:00.0', 'Friday', False),
 ('2013-12-21 00:00:00.0', 'Saturday', True),
 ('2013-12-22 00:00:00.0', 'Sunday', True),
 ('2013-12-23 00:00:00.0', 'Monday', False),
 ('2013-12-24 00:00:00.0', 'Tuesday', False),
 ('2013-12-25 00:00:00.0', 'Wednesday', False),
 ('2013-12-26 00:00:00.0', 'Thursday', False),
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 ('2013-12-31 00:00:00.0', 'Tuesday', False),
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 ('2014-01-06 00:00:00.0', 'Monday', False),
 ('2014-01-07 00:00:00.0', 'Tuesday', False),
 ('2014-01-08 00:00:00.0', 'Wednesday', False),
 ('2014-01-09 00:00:00.0', 'Thursday', False),
 ('2014-01-10 00:00:00.0', 'Friday', False),
 ('2014-01-11 00:00:00.0', 'Saturday', True),
 ('2014-01-12 00:00:00.0', 'Sunday', True),
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 ('2014-01-15 00:00:00.0', 'Wednesday', False),
 ('2014-01-16 00:00:00.0', 'Thursday', False),
 ('2014-01-17 00:00:00.0', 'Friday', False),
  ('2014-01-18 00:00:00.0', 'Saturday', True),
  ('2014-01-19 00:00:00.0', 'Sunday', True),
  ('2014-01-20 00:00:00.0', 'Monday', False),
  ('2014-01-21 00:00:00.0', 'Tuesday', False),
  ('2014-01-22 00:00:00.0', 'Wednesday', False),
  ('2014-01-23 00:00:00.0', 'Thursday', False),
  ('2014-01-24 00:00:00.0', 'Friday', False),
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  ('2014-01-26 00:00:00.0', 'Sunday', True),
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  ('2014-02-05 00:00:00.0', 'Wednesday', False),
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  ('2014-02-07 00:00:00.0', 'Friday', False),
  ('2014-02-08 00:00:00.0', 'Saturday', True),
  ('2014-02-09 00:00:00.0', 'Sunday', True),
  ('2014-02-10 00:00:00.0', 'Monday', False),
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  ('2014-02-13 00:00:00.0', 'Thursday', False),
  ('2014-02-14 00:00:00.0', 'Friday', False),
  ('2014-02-15 00:00:00.0', 'Saturday', True),
  ('2014-02-16 00:00:00.0', 'Sunday', True),
  ('2014-02-17 00:00:00.0', 'Monday', False),
  ('2014-02-18 00:00:00.0', 'Tuesday', False),
  ('2014-02-19 00:00:00.0', 'Wednesday', False),
  ('2014-02-20 00:00:00.0', 'Thursday', False),
  ('2014-02-21 00:00:00.0', 'Friday', False),
  ('2014-02-22 00:00:00.0', 'Saturday', True),
  ('2014-02-23 00:00:00.0', 'Sunday', True),
  ('2014-02-24 00:00:00.0', 'Monday', False),
  ('2014-02-25 00:00:00.0', 'Tuesday', False),
  ('2014-02-26 00:00:00.0', 'Wednesday', False),
  ('2014-02-27 00:00:00.0', 'Thursday', False),
  ('2014-02-28 00:00:00.0', 'Friday', False),
  ('2014-03-01 00:00:00.0', 'Saturday', True),
  ('2014-03-02 00:00:00.0', 'Sunday', True),
  ('2014-03-03 00:00:00.0', 'Monday', False),
  ('2014-03-04 00:00:00.0', 'Tuesday', False),
  ('2014-03-05 00:00:00.0', 'Wednesday', False),
  ('2014-03-06 00:00:00.0', 'Thursday', False),
  ('2014-03-07 00:00:00.0', 'Friday', False),
  ('2014-03-08 00:00:00.0', 'Saturday', True),
  ('2014-03-10 00:00:00.0', 'Monday', False),
  ('2014-03-11 00:00:00.0', 'Tuesday', False),
  ('2014-03-12 00:00:00.0', 'Wednesday', False),
  ('2014-03-13 00:00:00.0', 'Thursday', False),
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