

Transform

Ingest the raw data from the Bureau of Labor Statistics and transform it into simplified files prepared for analysis.

```
In [1]: import os
import cpi
import pandas as pd
```

```
In [2]: import warnings
warnings.filterwarnings("ignore")
```

```
In [3]: pd.set_option("display.max_columns", None)
```

Set all the years of data to transform

```
In [4]: years = range(1990, 2016)
```

The shortlist of industries to extract from the data

```
In [5]: whitelist = pd.DataFrame([
    ('10', 'Total, all industries', 'total'),
    ('111', 'Crop production', 'crops'),
    ('1151', 'Support activities for crop production', 'crops'),
], columns=['industry_code', 'industry_name', 'industry_group'])
```

Where to find the CSV files

```
In [6]: path_template = './data/{}.annual.singlefile.csv'
```

Area titles crosswalk to decode the raw data files

```
In [30]: area_titles = pd.read_csv("./data/area_titles.csv")
```

Loop through all years and transform the state and county level data for each

```

In [8]: for year in years:
        print "Transforming {}".format(year)

        # Read in the csv
        df = pd.read_csv(path_template.format(year), dtype={"area_fips": str})

        # Decode the area titles
        df = df.merge(area_titles, on="area_fips", how="inner")

        # Filter it down to desired industries using whitelist
        filtered_df = df.merge(whitelist, on='industry_code', how="inner")

        # Filter it down to the statewide aggregation level for each industry
        state_df = filtered_df[
            # Statewide totals for all industries
            ((filtered_df.agglvl_code == 50) & (filtered_df.industry_group == 'total')) |
            # Statewide totals for our selected industries
            (
                (filtered_df.agglvl_code.isin([55, 56])) &
                (filtered_df.own_code == 5) &
                (filtered_df.industry_group == 'crops')
            )
        ]

        # Filter it down to the county aggregation level for each industry
        county_df = filtered_df[
            # County totals for all industries
            ((filtered_df.agglvl_code == 70) & (filtered_df.industry_group == 'total')) |
            # County totals for our selected industries
            (
                (filtered_df.agglvl_code.isin([75, 76])) &
                (filtered_df.own_code == 5) &
                (filtered_df.industry_group == 'crops')
            )
        ]

        # Trim to only the columns we want
        trimmed_columns = [
            'area_fips',
            'area_title',
            'industry_code',
            'industry_name',
            'industry_group',
            'agglvl_code',
            'year',
            'own_code',
            'avg_annual_pay',
            'annual_avg_emplvl',
            'total_annual_wages',
        ]
        trimmed_state_df = state_df[trimmed_columns]
        trimmed_county_df = county_df[trimmed_columns]

        # Adjust wages for inflation

```

```

trimmed_state_df['total_annual_wages_2015'] = trimmed_state_df.apply(
    lambda x: cpi.to_2015_dollars(x.total_annual_wages, x.year),
    axis=1
)
trimmed_county_df['total_annual_wages_2015'] = trimmed_county_df.apply(
    lambda x: cpi.to_2015_dollars(x.total_annual_wages, x.year),
    axis=1
)

# Group totals by industry group
groupby = [
    'year',
    'area_fips',
    'area_title',
    'industry_group'
]
aggregation = {
    'annual_avg_emplvl': 'sum',
    'total_annual_wages_2015': 'sum'
}
grouped_state_df = trimmed_state_df.groupby(groupby).agg(aggregation).reset_index()
grouped_county_df = trimmed_county_df.groupby(groupby).agg(aggregation).reset_index()

# Recalculate average pay for the new group
grouped_state_df['avg_annual_pay_2015'] = (
    grouped_state_df.total_annual_wages_2015 / grouped_state_df.annual_avg_emplvl
)
grouped_county_df['avg_annual_pay_2015'] = (
    grouped_county_df.total_annual_wages_2015 / grouped_county_df.annual_avg_emplvl
)

# Write out each annual file separately
grouped_state_df.to_csv("./data/transformed_state_{}.csv".format(year), index=False)
grouped_county_df.to_csv("./data/transformed_county_{}.csv".format(year), index=False)

```

```
Transforming 1990
Transforming 1991
Transforming 1992
Transforming 1993
Transforming 1994
Transforming 1995
Transforming 1996
Transforming 1997
Transforming 1998
Transforming 1999
Transforming 2000
Transforming 2001
Transforming 2002
Transforming 2003
Transforming 2004
Transforming 2005
Transforming 2006
Transforming 2007
Transforming 2008
Transforming 2009
Transforming 2010
Transforming 2011
Transforming 2012
Transforming 2013
Transforming 2014
Transforming 2015
```

Combine all the annual files

```
In [9]: combined_state_df = pd.concat(
        [pd.read_csv("./data/transformed_state_{}.csv".format(year), dtype={"area_
         fips": str}) for year in years],
        ignore_index=True
    )
```

```
In [10]: combined_county_df = pd.concat(
        [pd.read_csv("./data/transformed_county_{}.csv".format(year), dtype={"area
         _fips": str}) for year in years],
        ignore_index=True
    )
```

Write them out

```
In [11]: combined_state_df.to_csv("./data/transformed_state.csv", index=False)
```

```
In [12]: combined_county_df.to_csv("./data/transformed_county.csv", index=False)
```