

# 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)

```

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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)
```