

# **Effective Programming Practices for Economists**

## **Data management with pandas**

### **Setting and renaming columns and indices**

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# Why the Index is important

The dataframe from before

|   | country | continent | year | life_exp |
|---|---------|-----------|------|----------|
| 0 | Cuba    | Americas  | 2002 | 77.16    |
| 1 | Cuba    | Americas  | 2007 | 78.27    |
| 2 | Spain   | Europe    | 2002 | 79.78    |
| 3 | Spain   | Europe    | 2007 | 80.94    |

Same dataset, different Index

|         |      | continent | life_exp |
|---------|------|-----------|----------|
| country | year |           |          |
| Cuba    | 2002 | Americas  | 77.16    |
|         | 2007 | Americas  | 78.27    |
| Spain   | 2002 | Europe    | 79.78    |

- We have seen that pandas aligns new columns in a DataFrame by index
- Many other operations are aligned by index
- Using a meaningful index makes this even safer
- Index should be unique and not contain floats

# Setting and resetting the index

assume `df` is our gapminder example

```
>>> df.index
RangeIndex(start=0, stop=4, step=1)

>>> df = df.set_index(["country", "year"])
>>> df.index
```

```
MultiIndex([( 'Cuba', 2002),
             ( 'Cuba', 2007),
             ( 'Spain', 2002),
             ( 'Spain', 2007)],
           names=['country', 'year'])
```

```
>>> df = df.reset_index()
>>> df.index
```

- `set_index` and `reset_index` are inverse functions
- `set_index` can take any column or list of columns
- Optional argument `drop=True` or `drop=False` determines what happens with the old index in `set_index`

# Renaming columns

assume `df` is our gapminder example

```
>>> df.columns
```

```
Index(['country', 'continent', 'year',  
      'life_exp'], dtype='string')
```

```
>>> new_names = {  
...     "life_exp": "life expectancy",  
...     "country": "country name",  
...     "continent": "continent name",  
... }
```

```
>>> df = df.rename(columns=new_names)  
>>> df.columns
```

```
Index(['country name', 'continent name',
```

- Dict can contain only the subset of variables that is actually renamed
- Renaming the index works the same way but is rarely needed
- Instead of a dict, you can provide a function that converts old names to new names!