

# **Effective Programming Practices for Economists**

## **Data Analysis in Python**

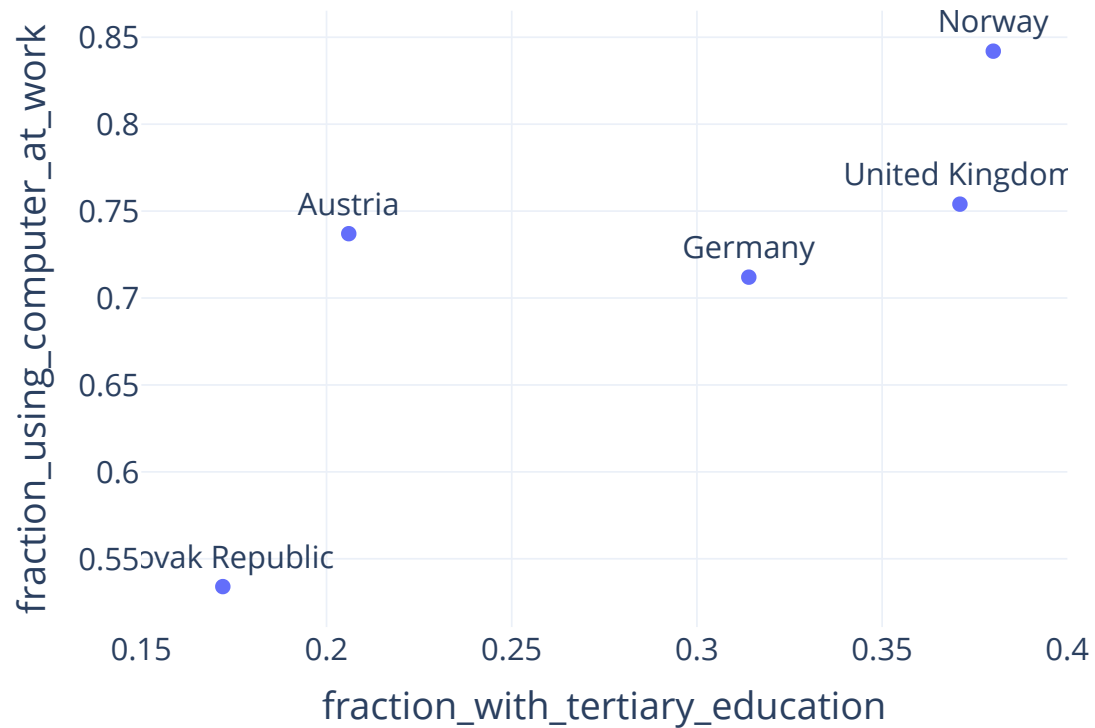
### **Running regressions using statsmodels**

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# Example

country	fraction_with_tertiary_education	fraction_using_computer_at_work
Slovak Republic	0.172	0.534
Austria	0.206	0.737
Germany	0.314	0.712
United Kingdom	0.371	0.754
Norway	0.38	0.842

# Example



# Importing conventions

- Plain statsmodels

```
import statsmodels.api as sm
```

- Formula interface

```
import statsmodels.formula.api as smf
```

# The formula interface

```
>>> model = smf.ols(  
...     data=df,  
...     formula="fraction_using_computer_at_work ~ fraction_with_tertiary_education",  
... )
```

- Use a regression model implemented in `statsmodels.formula.api`
- `data` is a dataframe, `formula` is a string
- Separate left-hand side and right-hand by `~`

# The formula interface

```
>>> model = smf.ols(  
...     data=df,  
...     formula="fraction_using_computer_at_work ~ fraction_with_tertiary_education",  
... )
```

- Intercept is implicit for OLS
- Right hand-side can contain lots of mathematical expressions
  - `+`, `**`, `*`, `:` for sums, powers, interactions
  - `c()` for categorical variables
  - `np.log()` for logarithms (and any similar functions)

# Model objects

```
>>> model = smf.ols(  
...     data=df,  
...     formula="fraction_using_computer_at_work ~ fraction_with_tertiary_education",  
... )  
>>> model  
<statsmodels.regression.linear_model.OLS at 0x7fb56c905250>
```

- Almost always, the next step is to call the `.fit()` method on the model object.