Why Stata is the best programming language to start data analysis

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What are we comparing?

1. Programming language
2. Software application
3. Documentation
4. Community

Programming language

- human readable syntax
- designed for data analysis
- good default options

Two-Column Slide

Brattle

A typical day for Brattle RAs includes:

- Combining economic theory and industry knowledge to solve real problems
- Diving into data, using statistical analyses to extract information from messy data
- Constructing models from a blend of theoretical concepts to answer complex questions
- Reviewing literature and industry trends to understand the debate around key developments
- Conducting statistical analysis and working with data using tools such as Stata, R, Excel or Python
- Auditing and contributing to the creation of financial, economic, and operational models

COMPASS LEXECON

Key responsibilities:

- Interacting extensively with clients to gain insight into their industry
- Contributing to development of theoretical and empirical approach
- Utilising literature to support economic arguments
- Efficiently conducting empirical analysis using Excel and Stata
- Overseeing the day-to-day running of the project
- Drafting reports summarising analysis
- Delivering an accurate and high-quality work product
- Participating actively in client meetings and conference calls
- Extensive mentoring and supervising of junior staff

Code Example

```
/* Hotel price data */
use "hotels-europe_price.dta", clear
/* Add hotel features (location,
  stars, ratings, etc.) */
merge m:1 hotel_id using
  "hotels-europe_features.dta"
/* Censor prices that are too high */
replace price = 1000 if price > 1000
/* Regress price on ratings, stars,
  plus month, weekend dummies */
regress price rating stars i.month
  i.weekend, vce(cluster country)
```

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```
Linear regression                               Number of obs     =    115,367
                                                F(10, 30)         =     272.88
                                                Prob > F          =     0.0000
                                                R-squared         =     0.2577
                                                Root MSE          =     146.52

                                     (Std. Err. adjusted for 31 clusters in country)
------------------------------------------------------------------------------
             |               Robust
       price |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      rating |     21.5814   7.861631     2.75   0.010     5.52581    37.63699
       stars |    52.54748   8.304822     6.33   0.000     35.58677    69.50819
             |
       month |
           2 |    6.944091   5.554252     1.25   0.221    -4.399204    18.28739
           3 |    22.07722   5.573216     3.96   0.000     10.6952    33.45925
           4 |     29.2734   4.929571     5.94   0.000     19.20587    39.34093
           5 |    40.27256   4.755351     8.47   0.000     30.56084    49.98428
           6 |    40.54402   5.855406     6.92   0.000     28.58568    52.50235
          11 |    9.108877   4.401348     2.07   0.047     .1201249    18.09763
          12 |    187.1044   15.04021    12.44   0.000     156.3882    217.8206
             |
   1.weekend |    1.828793   6.036309     0.30   0.764    -10.49899    14.15658
       _cons |   -142.8199   16.73315    -8.54   0.000    -176.9935   -108.6462
------------------------------------------------------------------------------
```

Code Example

```
/* keep only 5-star hotels */
keep if stars == 5
/ * mean price and rating by country */
collapse (mean) price (mean) rating,
  by(country)
label variable price "Price (€)"
label variable rating "Rating (1 to 5)"
scatter price rating, scheme(economist)
```

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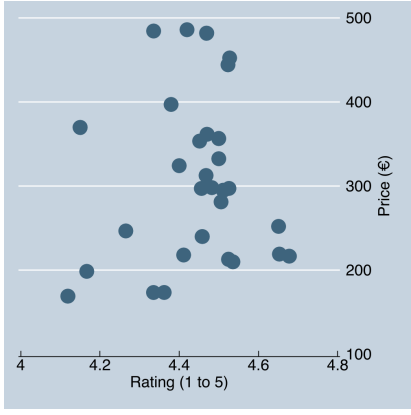

Stata vs R

```
scatter price rating, scheme(economist)
```

```
ggplot(five_s
```

Stata vs Python

```
replace price = 1000 if price > 1000
```

```
data.loc[data
```

Same in Python

```
import pandas as pd
import matplotlib.pyplot as plt

# load hotel price data
price_data = pd.read_stata("hotels-europe_price.dta")

# add hotel features (location, stars, ratings, etc.)
features = pd.read_stata("hotels-europe_features.dta")
data = price_data.merge(features, on="hotel_id", how="left")

# replace high prices with 1000
data.loc[data["price"] > 1000, "price"] = 1000

# regress price on ratings, stars, plus month, weekend dummies
data = pd.get_dummies(data, columns=["month", "weekend"])
result = sm.OLS(data["price"], data[["rating", "stars"] + list(data.columns[data.columns.str.startswith("month_")])
  + list(data.columns[data.columns.str.startswith("weekend_")])]).fit(cov_type="cluster", cov_kwds={"groups": data["country"]})

# keep only 5-star hotels
data = data[data["stars"] == 5]

# calculate mean price and rating by country
data = data.groupby("country").mean()[["price", "rating"]]

# label variables
data.rename(columns={"price": "Price (€)", "rating": "Rating (1 to 5)"}, inplace=True)

# scatterplot
data.plot(x="Price (€)", y="Rating (1 to 5)", kind="scatter", colormap="tab10", figsize=(8, 6))
plt.show()
```

Same in R

```r
library(tidyverse)
library(ggplot2)

# load hotel price data
price_data <- read_dta("hotels-europe_price.dta")

# add hotel features (location, stars, ratings, etc.)
features <- read_dta("hotels-europe_features.dta")
data <- left_join(price_data, features, by="hotel_id")

# replace high prices with 1000
data <- data %>% mutate(price=if_else(price > 1000, 1000, price))

# regress price on ratings, stars, plus month, weekend dummies
data <- data %>% mutate(month=factor(month), weekend=factor(weekend)) %>% nest(-country)
result <- data %>% mutate(model=map(data, ~ lm(price ~ rating + stars + month + weekend, data=.)),
                          summ=map(model, broom::tidy)) %>%
                  unnest(summ)

# subset data for 5-star hotels only
five_star_data <- data %>% filter(stars == 5) %>%
                          group_by(country) %>%
                          summarize(mean_price=mean(price), mean_rating=mean(rating))

# create scatterplot
ggplot(five_star_data, aes(x=mean_price, y=mean_rating)) +
  geom_point() +
  labs(x="Price (€)", y="Rating (1 to 5)") +
  scale_color_economist()
```