Grain yields and unit conversion

INTRODUCTION TO WRITING FUNCTIONS IN R

Richie Cotton
Curriculum Architect at DataCamp

USDA NASS

Corn and wheat

- Soon these will be food
- Hmm, delicious

1 acre = area of land 2 oxen can plough in a day

Not the 100 Acre Wood

1 hectare = 2 football fields

1 hectare = 150 New York apartments

1 bushel = 2 baskets of peaches

1 kilogram = 1 squirrel monkey

magrittr's pipeable operator replacements

operator	functional alternative
`x * y`	`x %>% multiply_by(y)`
`x ^ y`	`x %>% raise_to_power(y)`
`x[y]`	`x %>% extract(y)`

Let's practice!

INTRODUCTION TO WRITING FUNCTIONS IN R

Visualizing grain yields

INTRODUCTION TO WRITING FUNCTIONS IN R

Richie Cotton
Curriculum Architect at DataCamp

datacamp

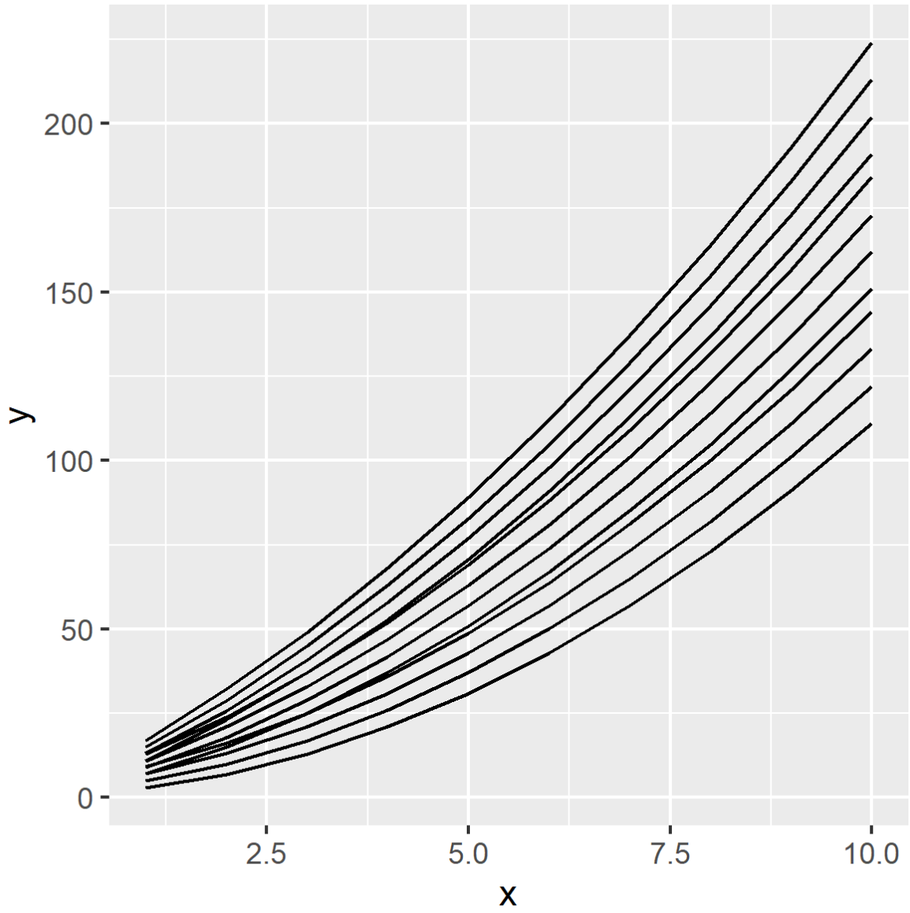
The corn dataset

```
glimpse(corn)
```

```
Observations: 6,381
Variables: 6
$ year                  <int> 1866, 1866, 1866, 1866, 1866, 1866...
$ state                 <chr> "Alabama", "Arkansas", "California...
$ farmed_area_acres     <dbl> 1050000, 280000, 42000, 57000, 200...
$ yield_bushels_per_acre <dbl> 9.0, 18.0, 28.0, 34.0, 23.0, 9.0, ...
$ farmed_area_ha        <dbl> 424919.92, 113311.98, 16996.80, 23...
$ yield_kg_per_ha       <dbl> 79.29892, 158.59784, 246.70776, 29...
```

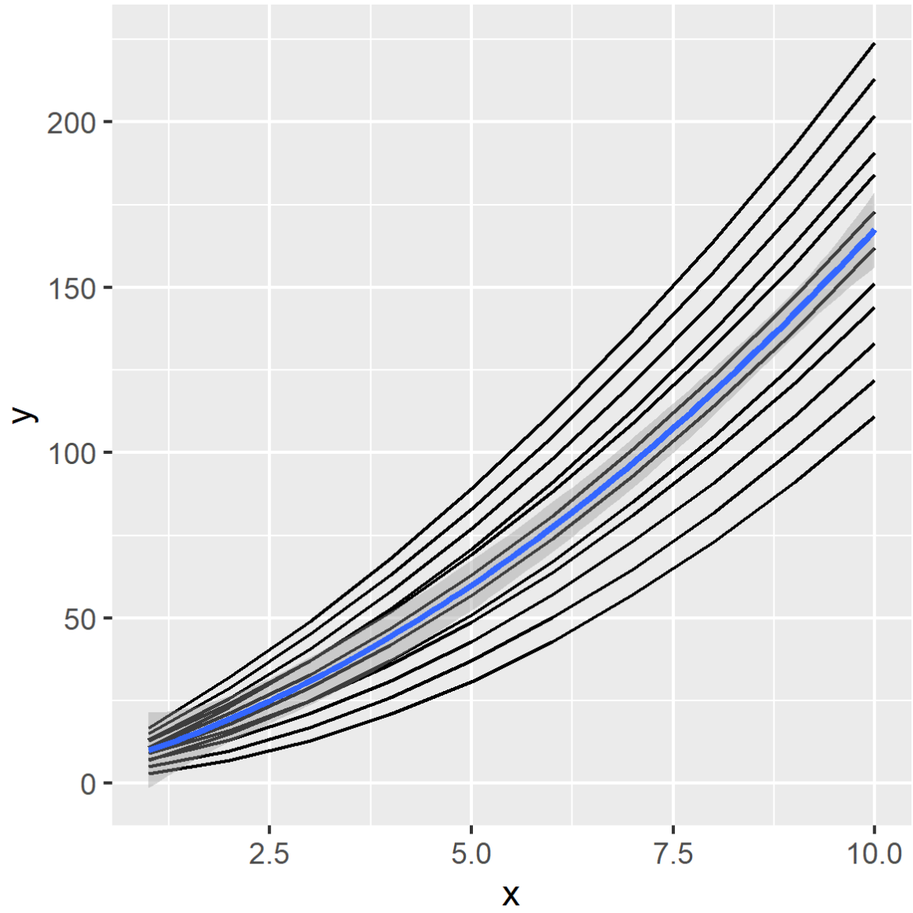
ggplot2: drawing multiple lines

```
ggplot(dataset, aes(x, y)) +
  geom_line(aes(group = group))
```



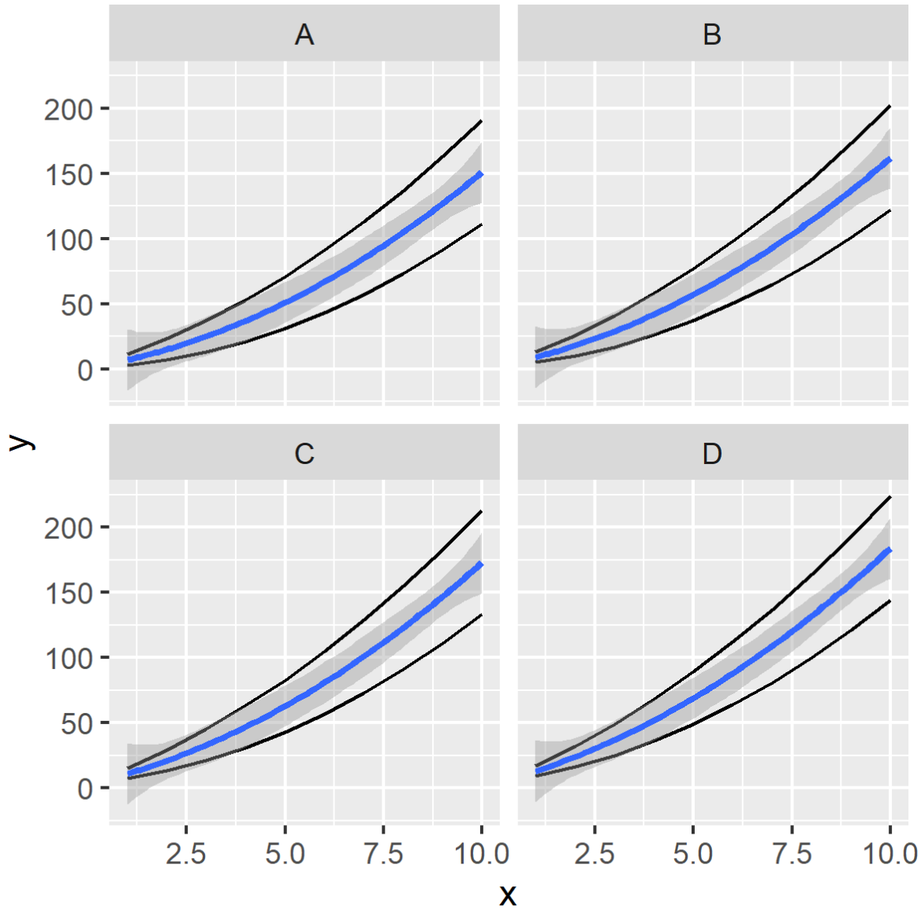
ggplot2: smooth trends

```
ggplot(dataset, aes(x, y)) +
  geom_line(aes(group = group)) +
  geom_smooth()
```

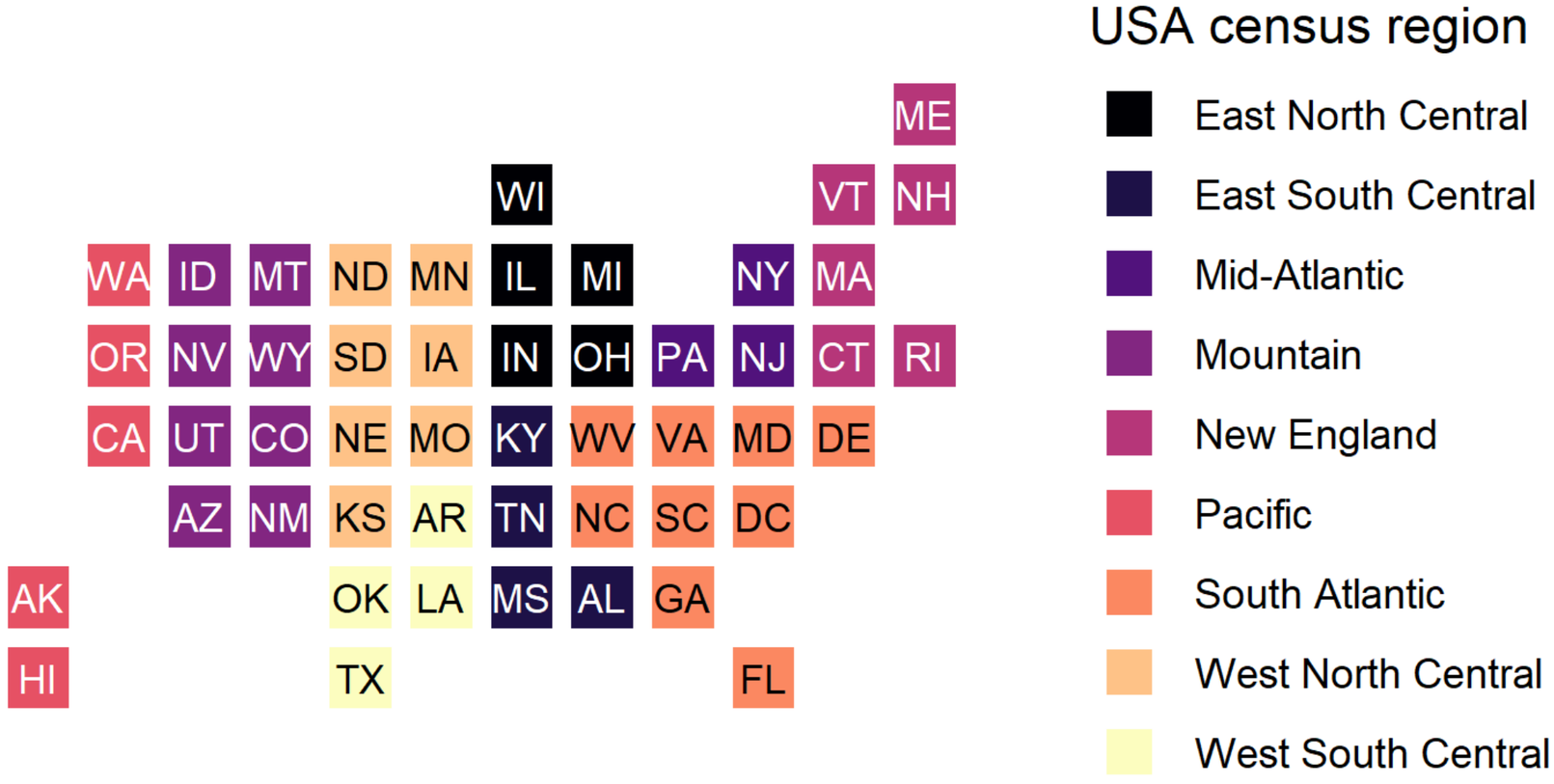


ggplot2: facetting

```
ggplot(dataset, aes(x, y)) +
  geom_line(aes(group = group)) +
  geom_smooth() +
  facet_wrap(vars(facet))
```



USA Census regions



dplyr inner joins

```
dataset1 %>%
  inner_join(dataset2, by = "column_to_join_on")
```

Let's practice!

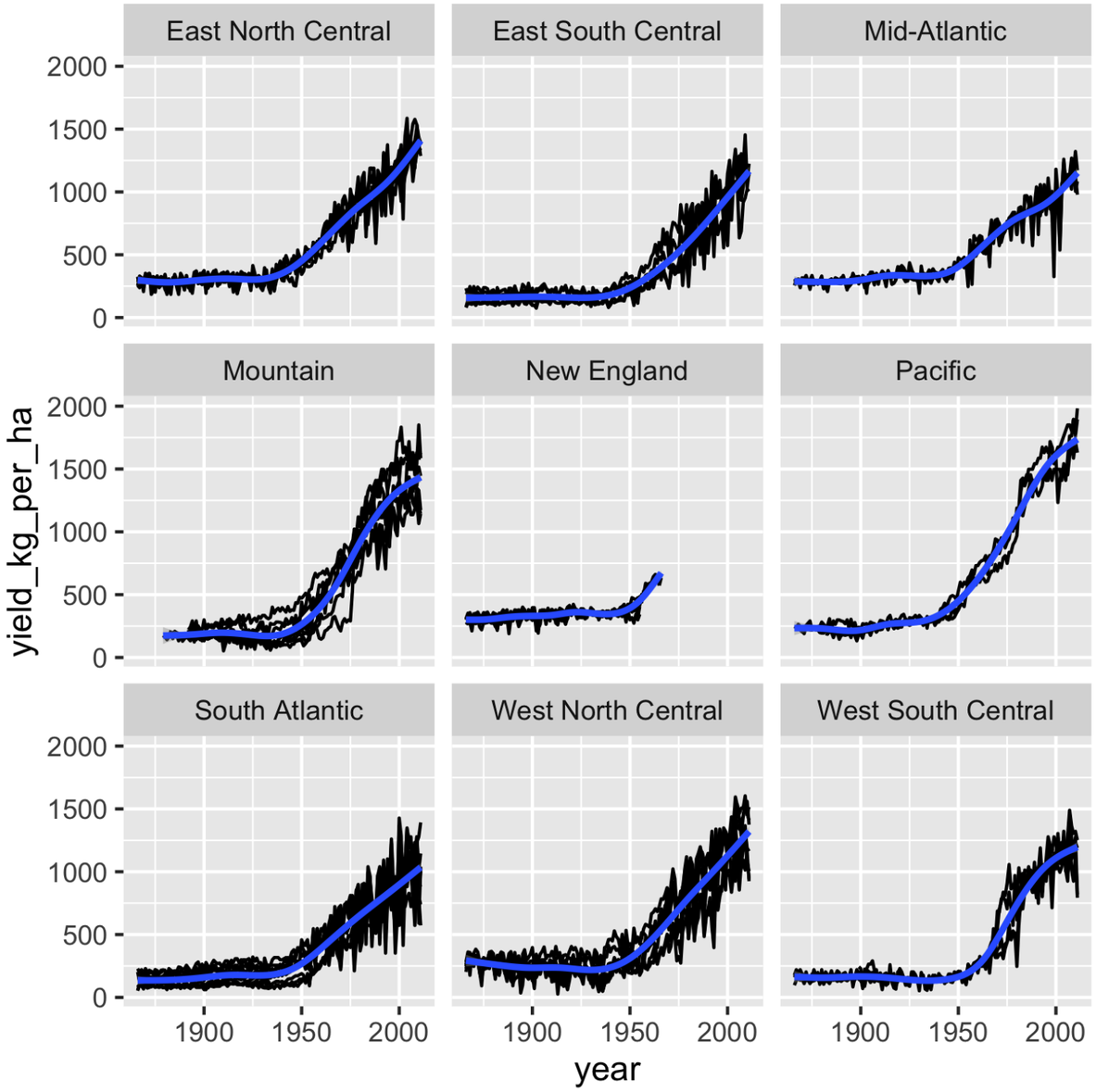
INTRODUCTION TO WRITING FUNCTIONS IN R

Modeling grain yields

INTRODUCTION TO WRITING FUNCTIONS IN R

Richie Cotton
Curriculum Architect at DataCamp

datacamp


East North Central
East South Central
Mid-Atlantic
Mountain
New England
Pacific
South Atlantic
West North Central
West South Central
yield_kg_per_ha
year
0
500
1000
1500
2000
1900
1950
2000

Linear models vs. generalized additive models

A linear model

```
lm(
  response_var ~ explanatory_var1 + explanatory_var2,
  data = dataset
)
```

A generalized additive model

```
library(mgcv)
gam(
  response_var ~ s(explanatory_var1) + explanatory_var2,
  data = dataset
)
```

Predicting GAMs

```
predict_this <- data.frame(
  explanatory_var1 = c("some", "values"),
  explanatory_var2 = c("more", "values")
)
```

```
predicted_responses <- predict(model, predict_this, type = "response")
```

```
predict_this %>%
  mutate(predicted_responses = predicted_responses)
```

Let's practice!

INTRODUCTION TO WRITING FUNCTIONS IN R

Congratulations

INTRODUCTION TO WRITING FUNCTIONS IN R

Richie Cotton
Curriculum Architect at DataCamp

In Chapter 1 you learned

- Writing your own functions lets you reuse code.
- There is a simple process for turning scripts into functions.
- Data arguments come before detail arguments.

In Chapter 2 you learned

- Defaults can be set using `name = value` syntax.
- Arguments can be passed between functions using their name or `...` .
- Checking user inputs can be done using `assertive` .

In Chapter 3 you learned

- You can return early from a function using `return()` .
- You can prevent return values being printed with `invisible()` .
- Functions can return multiple values using lists or attributes.
- R has rules about *scope* that determine which variables can be seen.

In Chapter 4 you learned

- Writing your own functions can be useful for your data analyses.
- Even simple, one-line functions can be helpful.

More modeling

Logistic Regression is covered in

- Introduction to Regression in R
- Intermediate Regression in R
- Generalized Linear Models in R

Generalized additive models are covered in

- Nonlinear Modeling in R with GAMs

Tidying models

Tidying models with broom is covered in

- Exploratory Data Analysis: Case Study
- Machine Learning in the Tidyverse
- Reshaping Data with tidyr

Unit testing

Unit testing code is covered in

- Developing R Packages

Environments

Environments are covered in

- Object-Oriented Programming with S3 and R6 in R

Thanks for taking the course!

INTRODUCTION TO WRITING FUNCTIONS IN R