

# Modeling in R and Tidying Results

## linear models and broom

2024-07-18

 ***This is not a course in a  
regression***

# Modeling in R

```
lm(y ~ x + z, data = df)
```

# Modeling in R

```
lm(y ~ x + z, data = df)
```

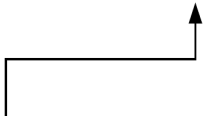


model  
function

# Modeling in R

```
lm(y ~ x + z, data = df)
```

variables  
in your  
data



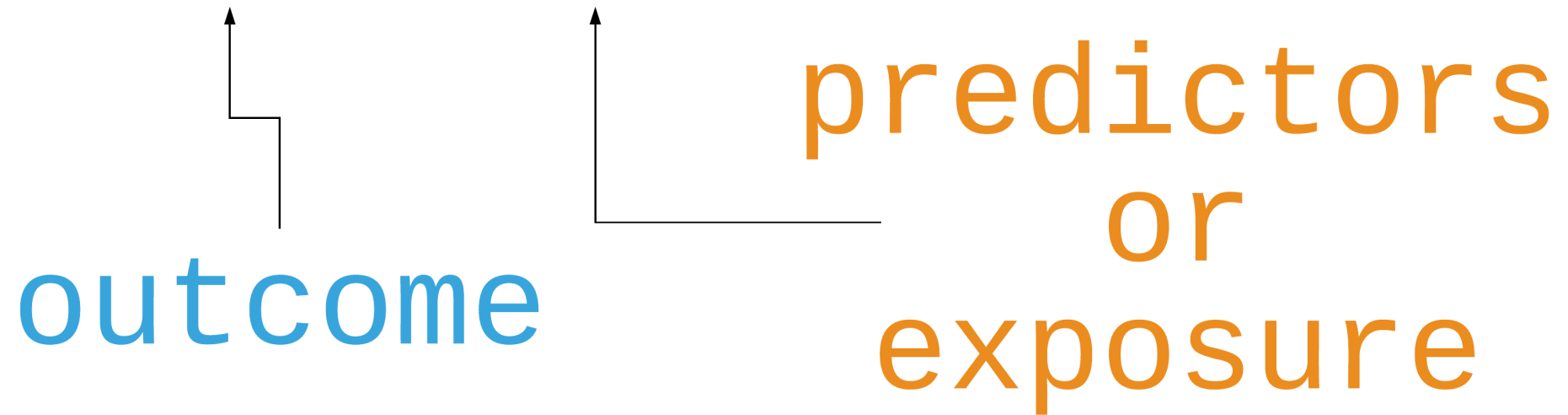
your  
data



# Modeling in R

```
lm(y ~ x + z, data = df)
```

outcome



predictors  
or  
exposure

# Modeling in R

`lm()` = *Linear Regression (OLS)*

`glm()` = *Generalized Linear Model (default family = Gaussian)*

# Modeling in R

```
1 lm(price ~ carat, data = diamonds)
```

Call:

```
lm(formula = price ~ carat, data = diamonds)
```

Coefficients:

(Intercept)	carat
-2256	7756



# Modeling in R

```
1 lm(price ~ carat, data = diamonds) |>
2   summary()
```

# **broom:** tidy models

**tidy()**

**glance()**

**augment()**



# broom: tidy models

`tidy()` = *model coefficients*

`glance()`

`augment()`



# broom: tidy models

`tidy()`

`glance()` = *model fit*

`augment()`



# broom: tidy models

`tidy()`

`glance()`

`augment()` = *model predictions*



# broom: tidy models

`tidy()`

`glance()`

`augment()`

**NOT** a core member of the tidyverse. Need to load with `library(broom)`



# Modeling in R

```
1 library(broom)
2 lm(price ~ carat, data = diamonds) |>
3 tidy()
```

```
# A tibble: 2 × 5
```

	term	estimate	std.error	statistic	p.value
	<chr>	<dbl>	<dbl>	<dbl>	<dbl>
1	(Intercept)	-2256.	13.1	-173.	0
2	carat	7756.	14.1	551.	0

# Modeling in R

```
1 lm(price ~ carat, data = diamonds) |>  
2   glance()
```

```
# A tibble: 1 × 12  
  r.squared adj.r.squared sigma statistic p.value    df  
    <dbl>      <dbl> <dbl>      <dbl>    <dbl> <dbl>  
1    0.849      0.849 1549.    304051.      0      1  
# i 6 more variables: logLik <dbl>, AIC <dbl>, BIC <dbl>,  
#   deviance <dbl>, df.residual <int>, nobs <int>
```



# Modeling in R

```
1 lm(price ~ carat, data = diamonds) |>  
2   augment()
```

```
# A tibble: 53,940 × 8
```

	price	carat	.fitted	.resid	.hat	.sigma	.cooksd
	<int>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
1	326	0.23	-472.	798.	0.0000452	1549.	0.00000600
2	326	0.21	-628.	954.	0.0000471	1549.	0.00000892
3	327	0.23	-472.	799.	0.0000452	1549.	0.00000602
4	334	0.29	-7.00	341.	0.0000398	1549.	0.000000966
5	335	0.31	148.	187.	0.0000382	1549.	0.000000278
6	336	0.24	-395.	731.	0.0000442	1549.	0.00000493
7	336	0.24	-395.	731.	0.0000442	1549.	0.00000493
8	337	0.26	-240.	577.	0.0000424	1549.	0.00000294
9	337	0.22	-550.	887.	0.0000461	1549.	0.00000756
10	338	0.23	-472.	810.	0.0000452	1549.	0.00000618
" . . . . .							

# Try it yourself

**Work your way through the exercises. If anything in particular is giving you trouble, we'll work through it together.**

# Resources

**Tidy Models with R:** a deeper dive into tidymodels. Free online. Focused on machine learning and prediction.

**Causal Inference in R:** Causal modeling in R. Free online.

**UCLA IDRE:** Useful resources on modeling in R and other languages

