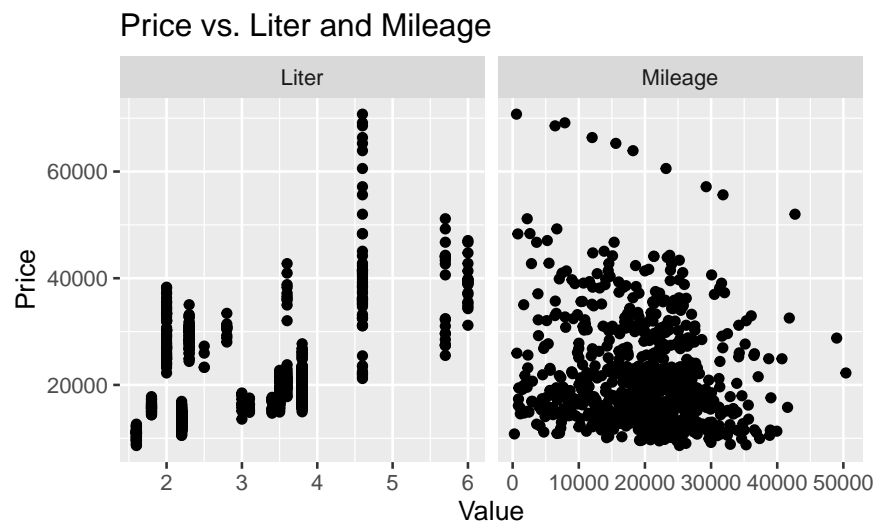# Assignment 10: How much for that car?

FirstName LastName

2025-10-30

Exercise 1

Exercise 2

term	estimate	std.error	statistic	p.value
(Intercept)	9426.6014688	1095.0777745	8.608157	0.0e+00
Liter	4968.2781155	258.8011436	19.197280	0.0e+00
Mileage	-0.1600285	0.0349084	-4.584237	5.3e-06

```
## [1] 0.3291279
```

Exercise 3

```
lit <- unique(car_prices$Liter)
mil <- unique(car_prices$Mileage)
grid <- with(car_prices, expand.grid(lit, mil))
```

```r
d <- setNames(data.frame(grid), c("Liter", "Mileage"))
vals <- predict(continuous_model, newdata = d)

m <- matrix(vals, nrow = length(unique(d$Liter)), ncol = length(unique(d$Mileage)))

p <- plot_ly() %>%
  add_markers(
    x = ~car_prices$Mileage,
    y = ~car_prices$Liter,
    z = ~car_prices$Price,
    marker = list(size = 1)
  ) %>%
  add_trace(
    x = ~mil,
    y = ~lit,
    z = ~m,
    type = "surface",
    colorscale = list(c(0,1), c("yellow", "yellow")),
    showscale = FALSE
  ) %>%
  layout(
    scene = list(
      xaxis = list(title = "Mileage"),
      yaxis = list(title = "Liters"),
      zaxis = list(title = "Price")
    )
  )

if (!is_pdf) { p }
```
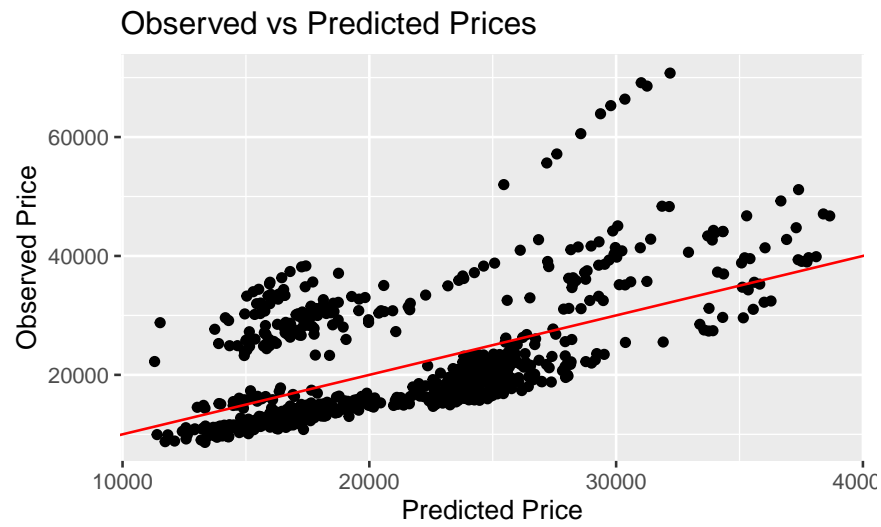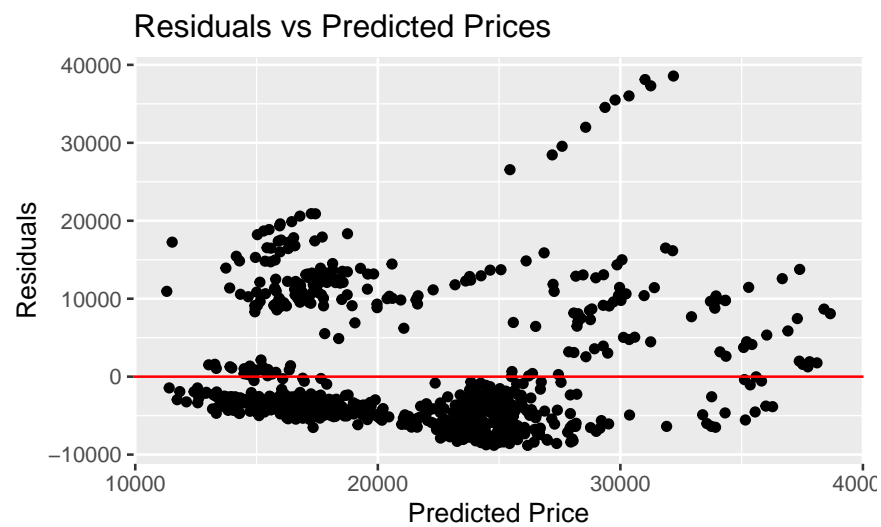
Exercise 4

Price	Mileage	Make	Model	Trim	Type	Cylinder	Liter	Doors	Cruise	Sound	Leather	pred	resid
17314.10	8221	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	1	1	23512.67	-6198.566
17542.04	9135	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	1	0	23366.40	-5824.367
16218.85	13196	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	1	0	22716.53	-6497.679
16336.91	16342	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	0	0	22213.08	-5876.164
16339.17	19832	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	0	1	21654.58	-5315.407
15709.05	22236	Buick	Century	Sedan 4D	Sedan	6	3.1	4	1	1	0	21269.87	-5560.816

Exercise 5

Observed vs Predicted Prices

Exercise 6

Residuals vs Predicted Prices

Exercise 7

Q–Q Plot of Residuals

Exercise 8

Effect of make of car on price

Exercise 9

Boxplots of Price by Categorical Variables
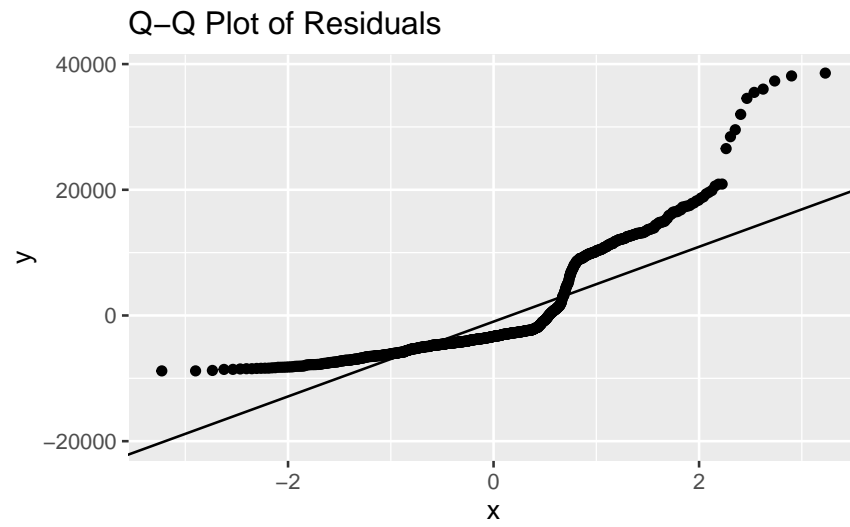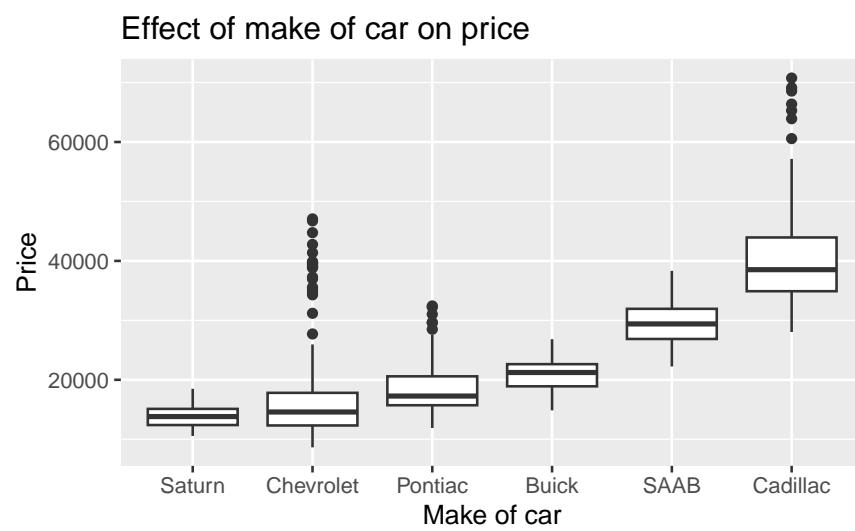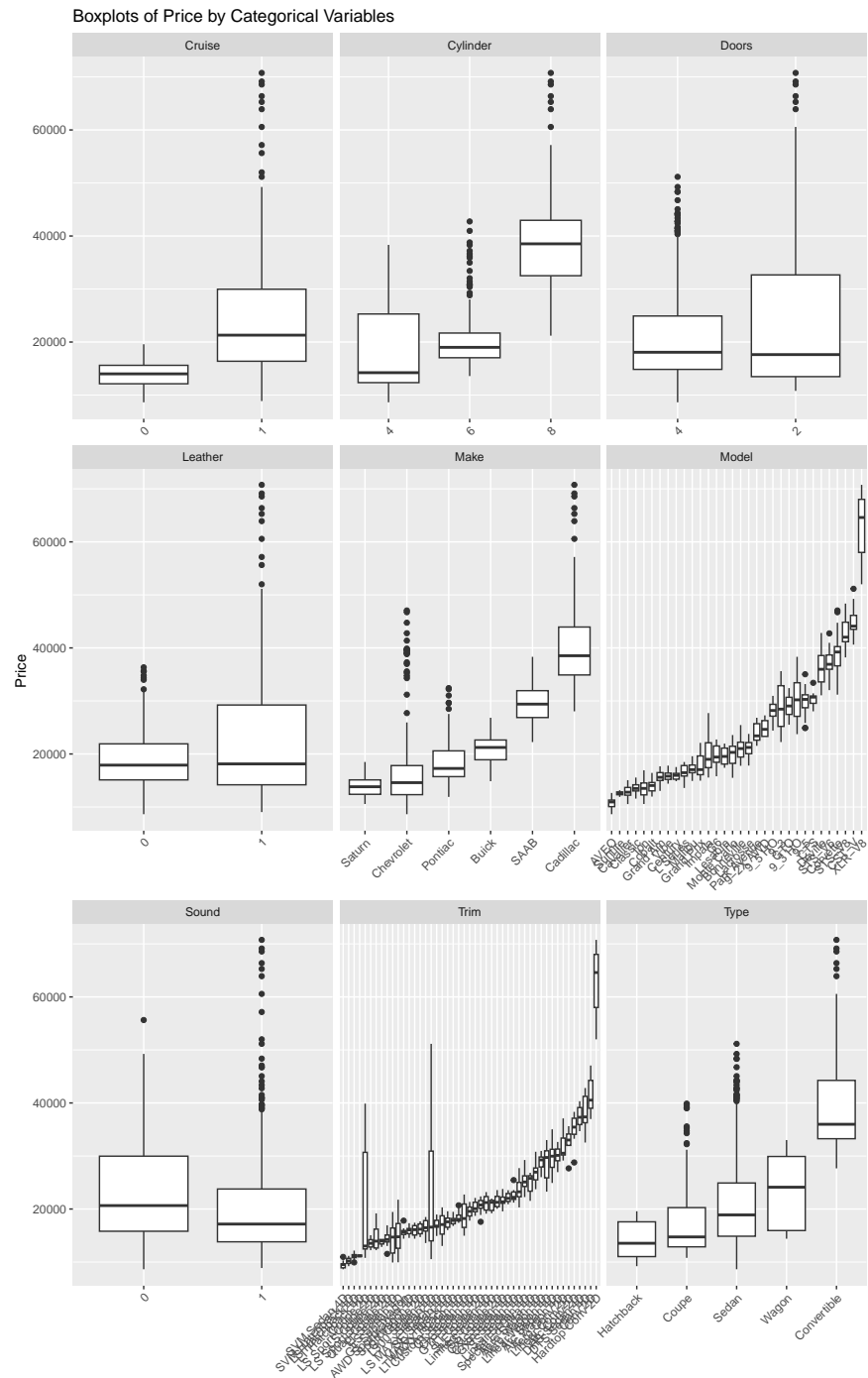
Exercise 10

term	estimate	std.error	statistic	p.value
(Intercept)	1.885018e+04	892.4119413	21.122738	0.0000000

term	estimate	std.error	statistic	p.value
Mileage	-1.861764e-01	0.0106433	-17.492387	0.0000000
Liter	5.697442e+03	342.7322419	16.623596	0.0000000
Cylinder6	-3.312544e+03	619.9683651	-5.343086	0.0000001
Cylinder8	-3.672597e+03	1246.2162662	-2.946998	0.0033032
MakeCadillac	1.450444e+04	517.9855224	28.001635	0.0000000
MakeChevrolet	-2.270807e+03	355.9736337	-6.379145	0.0000000
MakePontiac	-2.355468e+03	363.9063301	-6.472731	0.0000000
MakeSAAB	9.905074e+03	450.2011112	22.001443	0.0000000
MakeSaturn	-2.090266e+03	470.8305609	-4.439529	0.0000103
TypeCoupe	-1.163869e+04	464.7055454	-25.045297	0.0000000
TypeHatchback	-1.172638e+04	545.3936364	-21.500769	0.0000000
TypeSedan	-1.178618e+04	411.1021489	-28.669707	0.0000000
TypeWagon	-8.156551e+03	500.6379995	-16.292312	0.0000000

[1] 0.9389165

Exercise 11

Exercise 12

Academic Integrity statement