

Cap1

```
#VERIFICAR SE O PACOTE ESTÁ CARREGADO
pacotesRequisitados = c("tidyverse")
for(p in pacotesRequisitados){
  if(!require(
    p, character.only = TRUE
  ))
    install.packages(p)
  library(p,character.only = TRUE)
}
```

Carregando pacotes exigidos: tidyverse

-- Attaching core tidyverse packages ----- tidyverse 2.0.0 --

v dplyr 1.1.4 v readr 2.1.4

v forcats 1.0.0 v stringr 1.5.1

v ggplot2 3.4.4 v tibble 3.2.1

v lubridate 1.9.3 v tidyr 1.3.0

v purrr 1.0.2

-- Conflicts ----- tidyverse_conflicts() --

x dplyr::filter() masks stats::filter()

x dplyr::lag() masks stats::lag()

i Use the conflicted package (<<http://conflicted.r-lib.org/>>) to force all conflicts to become errors

Carregamento dos Dados.

mpg

A tibble: 234 x 11

manufacturer model displ year cyl trans drv cty hwy fl class

<chr> <chr> <dbl> <int> <int> <chr> <chr> <int> <int> <chr> <chr>

1 audi a4 1.8 1999 4 auto~ f 18 29 p comp~

2 audi a4 1.8 1999 4 manu~ f 21 29 p comp~

3 audi a4 2 2008 4 manu~ f 20 31 p comp~

4 audi a4 2 2008 4 auto~ f 21 30 p comp~

5 audi a4 2.8 1999 6 auto~ f 16 26 p comp~

6 audi a4 2.8 1999 6 manu~ f 18 26 p comp~

7 audi a4 3.1 2008 6 auto~ f 18 27 p comp~

8 audi a4 quattro 1.8 1999 4 manu~ 4 18 26 p comp~

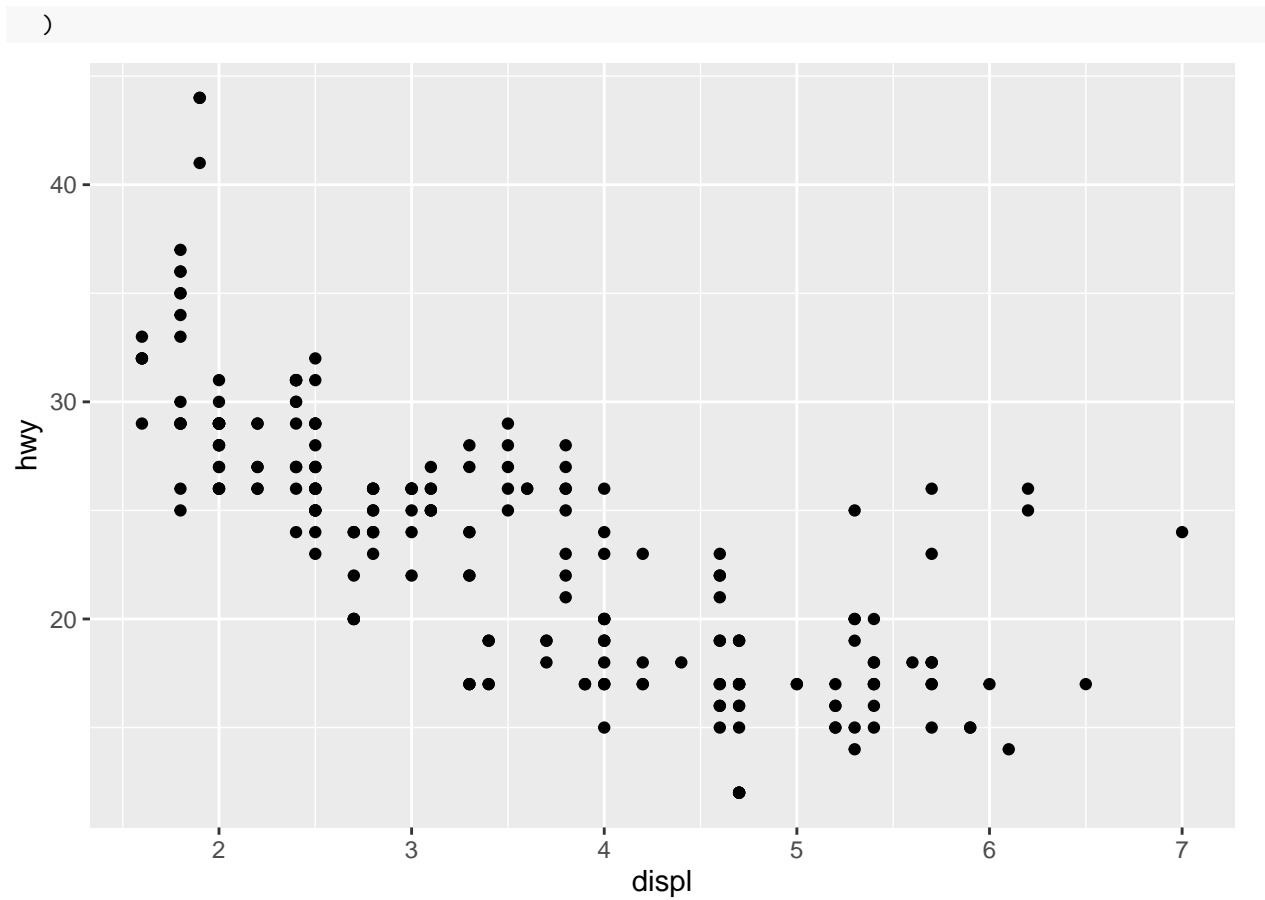
9 audi a4 quattro 1.8 1999 4 auto~ 4 16 25 p comp~

10 audi a4 quattro 2 2008 4 manu~ 4 20 28 p comp~

i 224 more rows

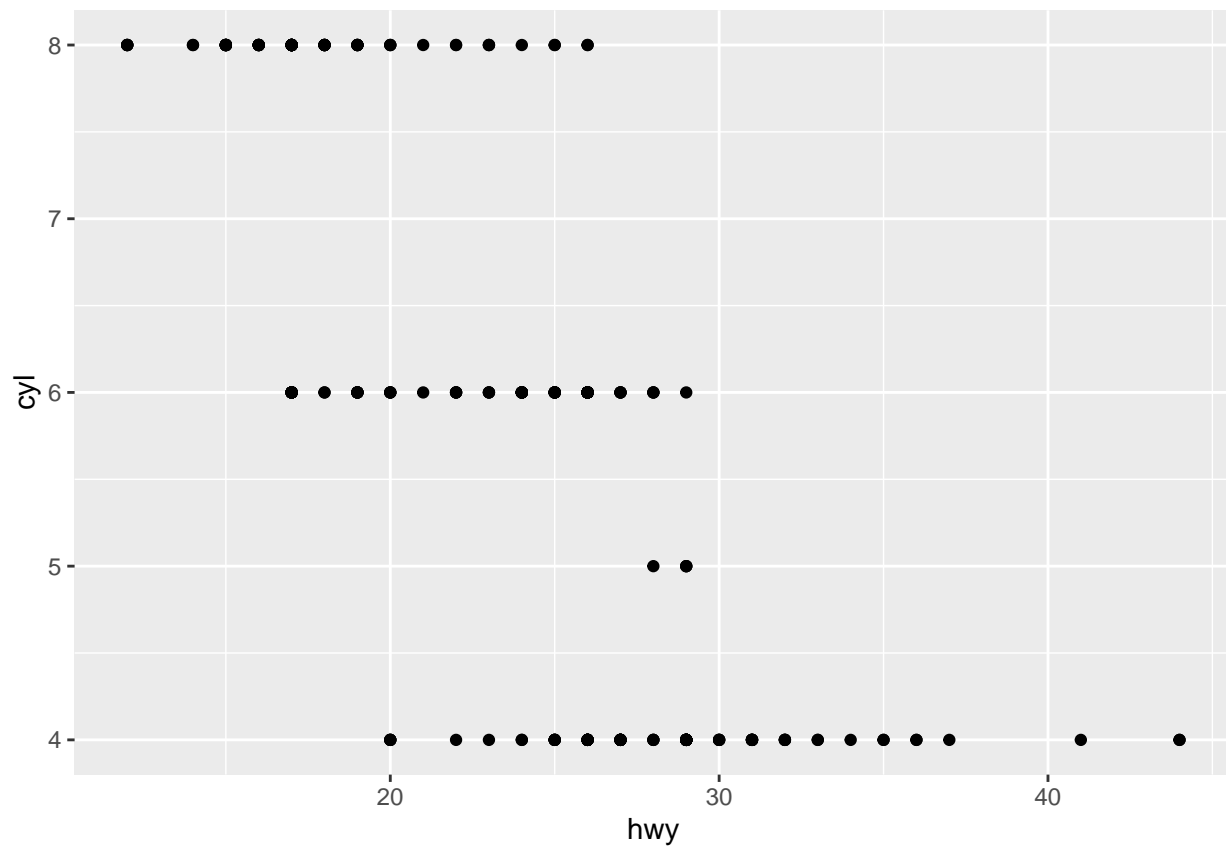
Criação de um ggplot.

```
ggplot(data = mpg) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  )
```



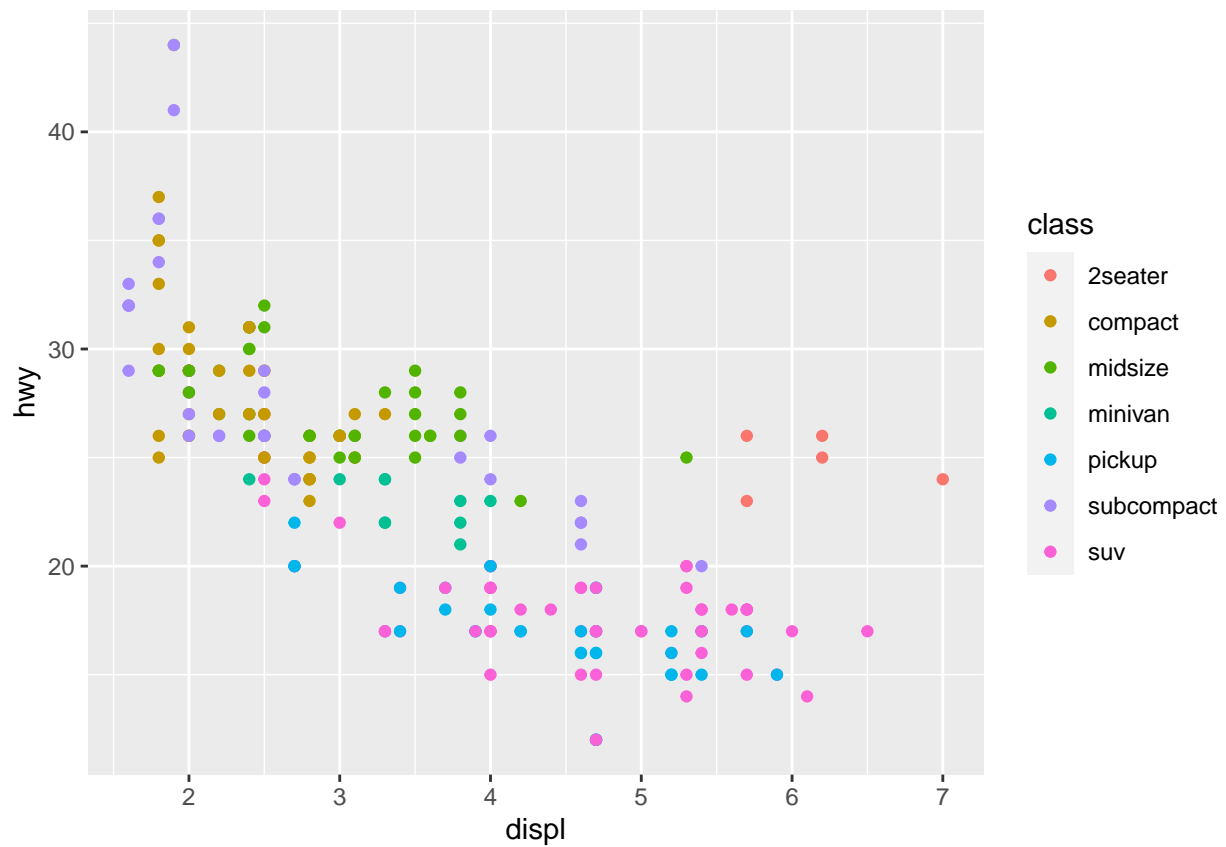
Pagina 6 - Exercício 4

```
ggplot(data = mpg) +  
  geom_point(  
    mapping = aes(  
      x=hwy, y=cyl  
    )  
  )  
)
```



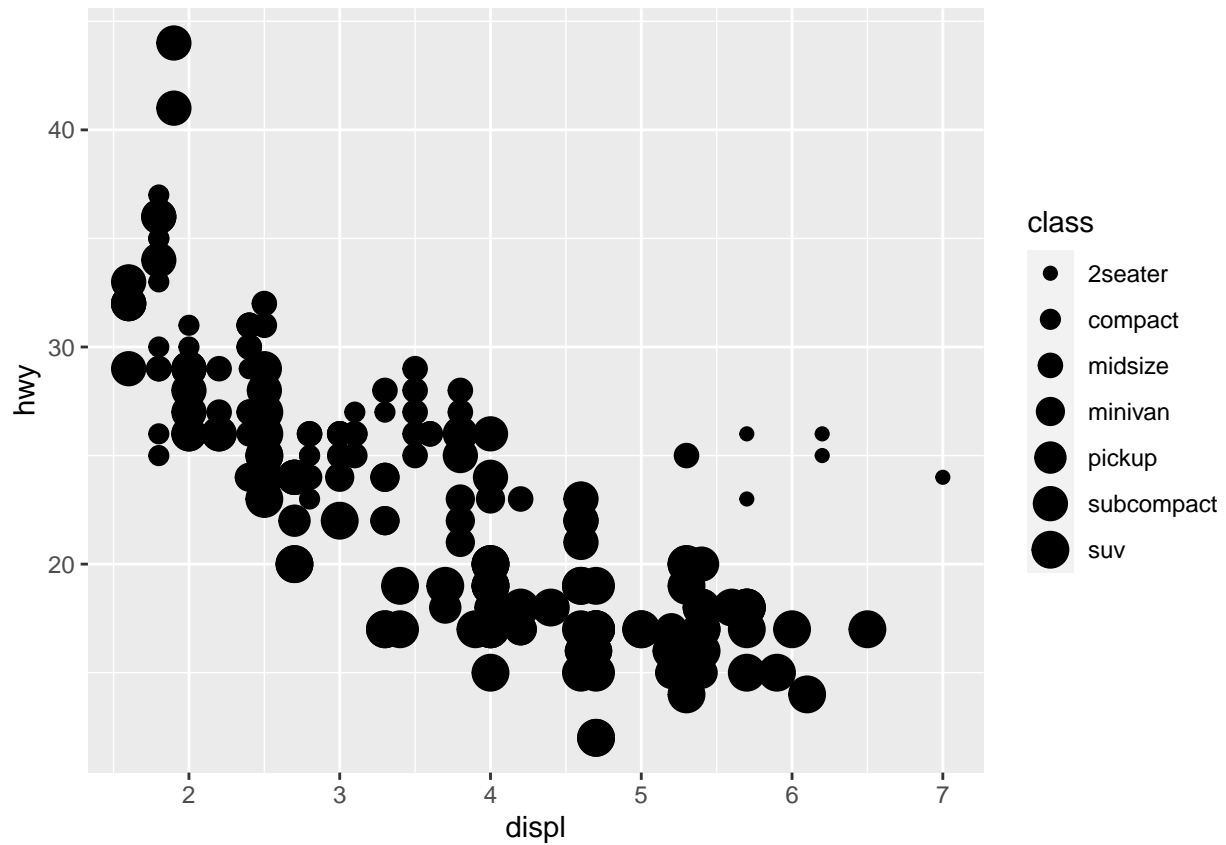
Pagina 8

```
ggplot(data = mpg) +  
  geom_point(  
    mapping = aes(  
      x = displ, y = hwy, color = class  
    )  
  )  
)
```



```
ggplot(data=mpg) +
  geom_point(
    mapping = aes(
      x=displ, y=hwy, size=class
    )
  )
```

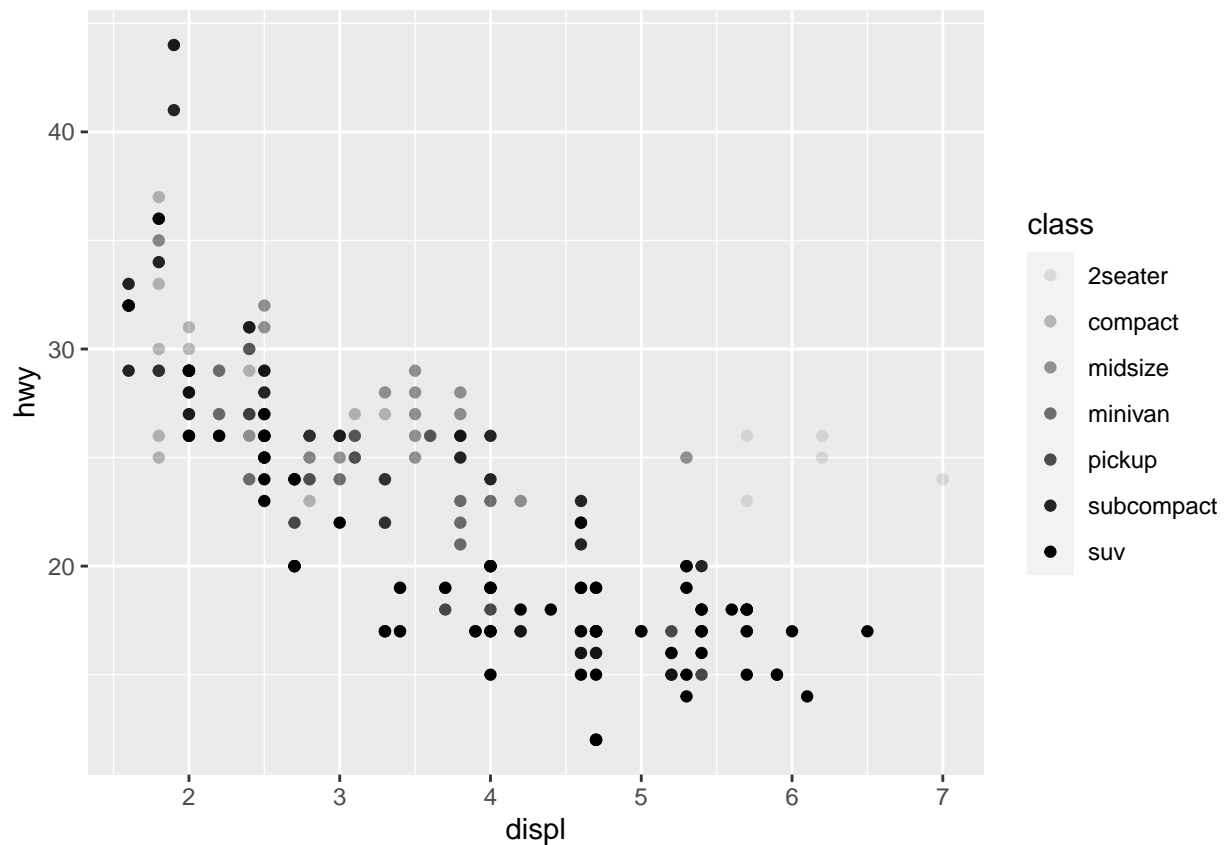
Warning: Using size for a discrete variable is not advised.



Top

```
ggplot(data=mpg)+  
  geom_point(  
    mapping = aes(  
      x=displ, y=hwy, alpha=class  
    )  
  )  
)
```

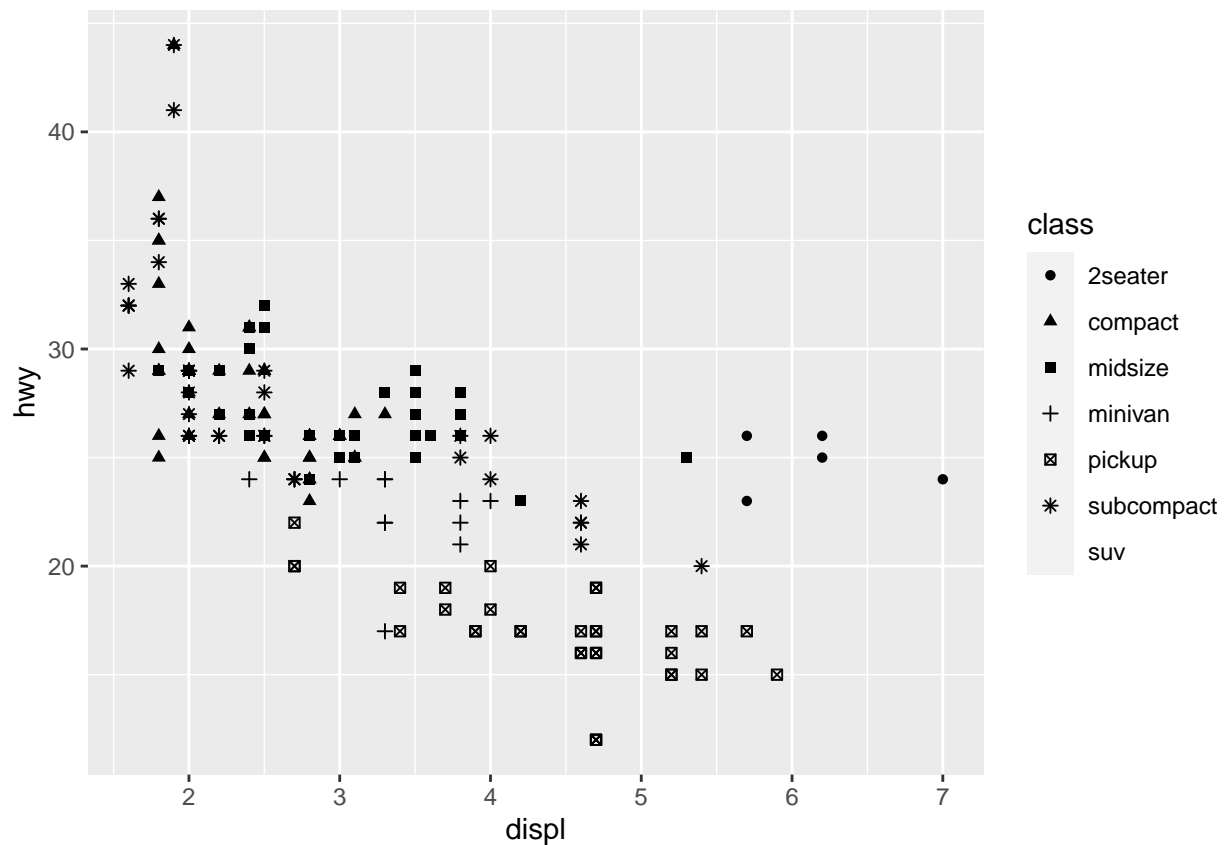
Warning: Using alpha for a discrete variable is not advised.



Bottom

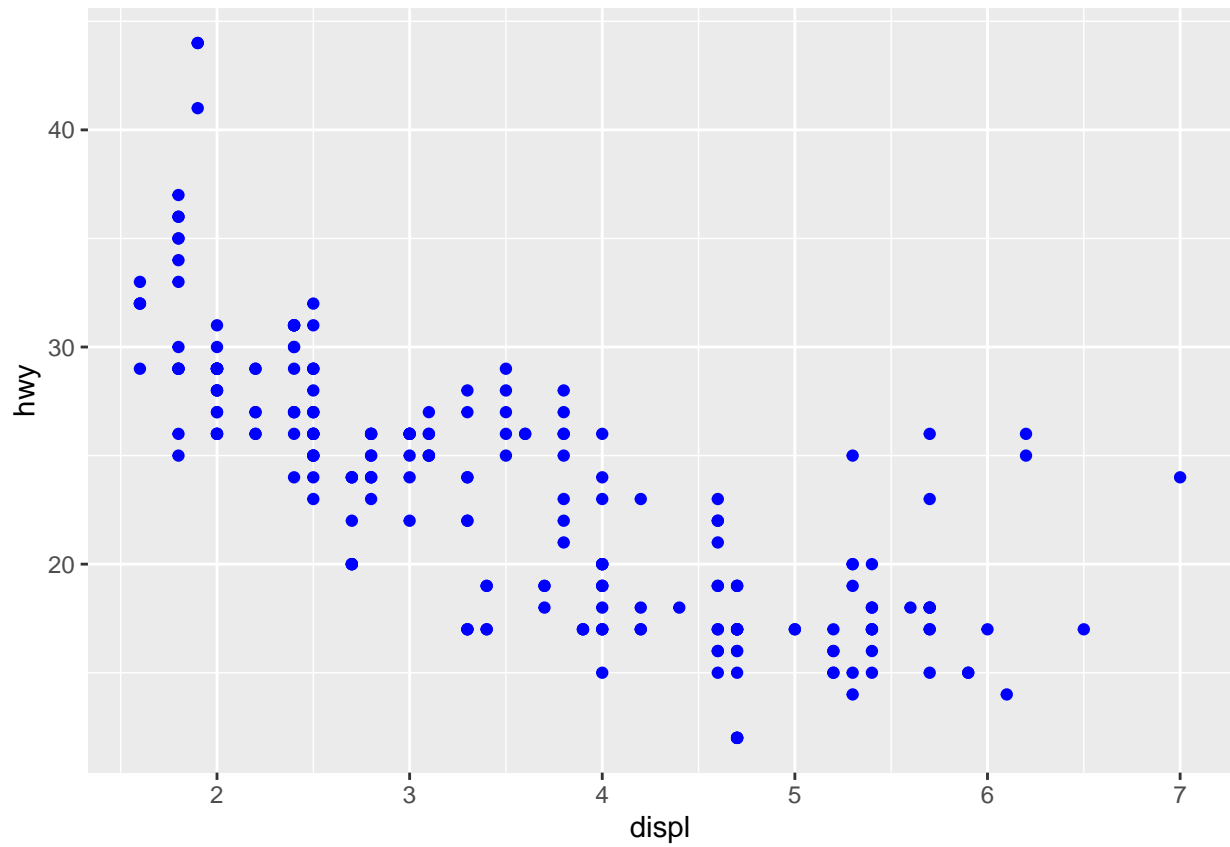
```
ggplot(data=mpg)+
  geom_point(
    mapping = aes(
      x=displ, y=hwy, shape=class #utilização de 6 classes, se houver mais categorias fica fora
    )
  )
```

```
## Warning: The shape palette can deal with a maximum of 6 discrete values because
## more than 6 becomes difficult to discriminate; you have 7. Consider
## specifying shapes manually if you must have them.
## Warning: Removed 62 rows containing missing values (`geom_point()`).
```



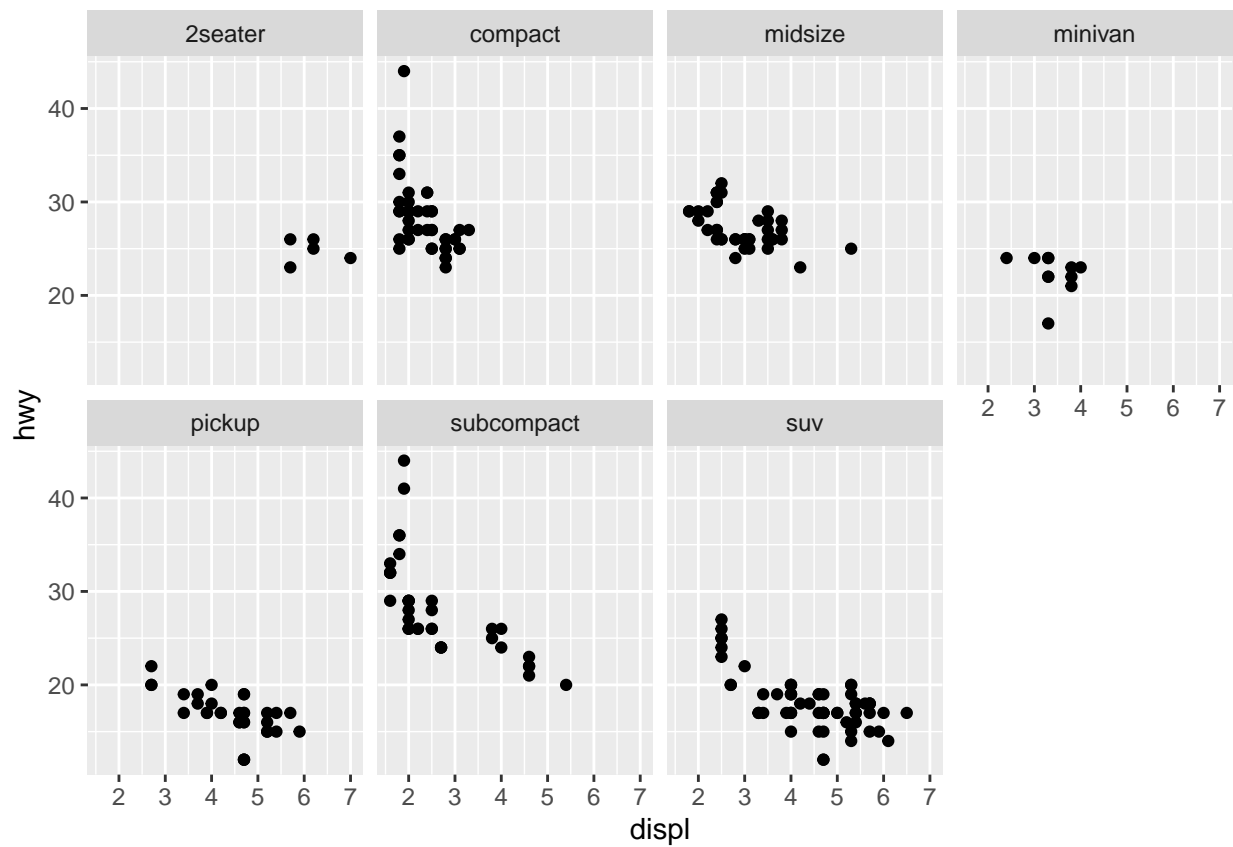
Podemos configurar as propriedades manualmente deixando todos os pontos azuis por exemplo

```
ggplot(
  data=mpg
) +
  geom_point(
    mapping = aes(
      x=displ, y=hwy
    ), color="blue" # a cor não transmite a informação sobre uma variável
  )
```



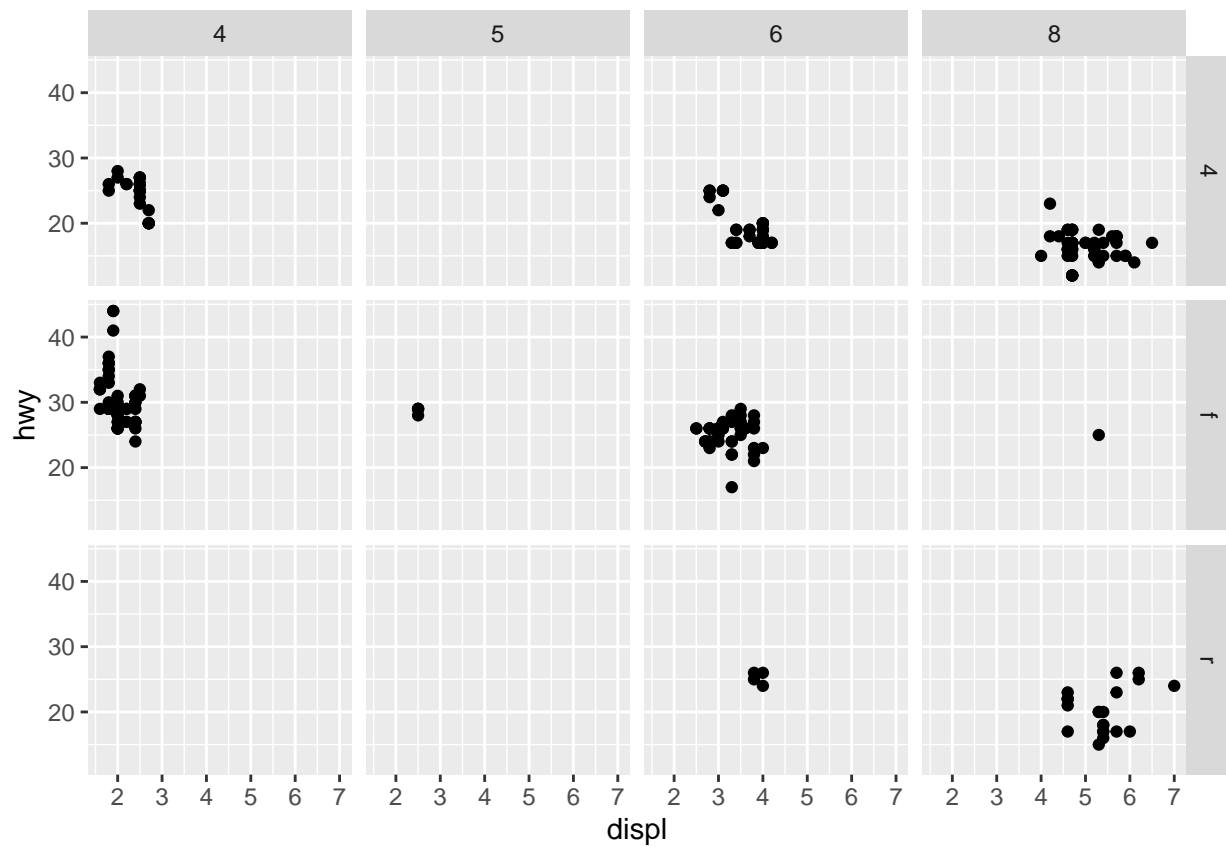
Facetas

```
ggplot( data = mpg ) +  
  geom_point(  
    mapping = aes(  
      x = displ, y = hwy  
    )  
  ) +  
  facet_wrap(  
    ~ class, nrow = 2  
  )
```

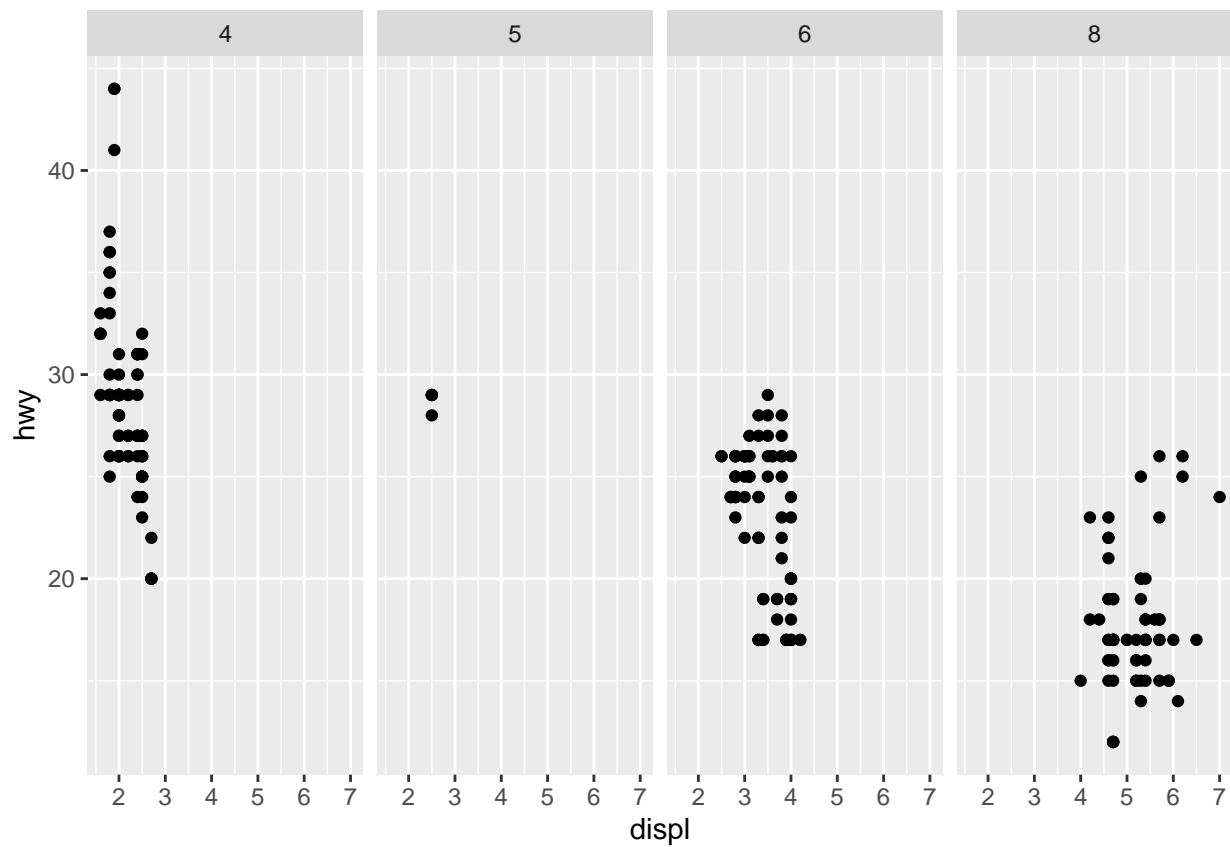



Combinação com mais variáveis

```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  ) +
  facet_grid( drv ~ cyl)
```

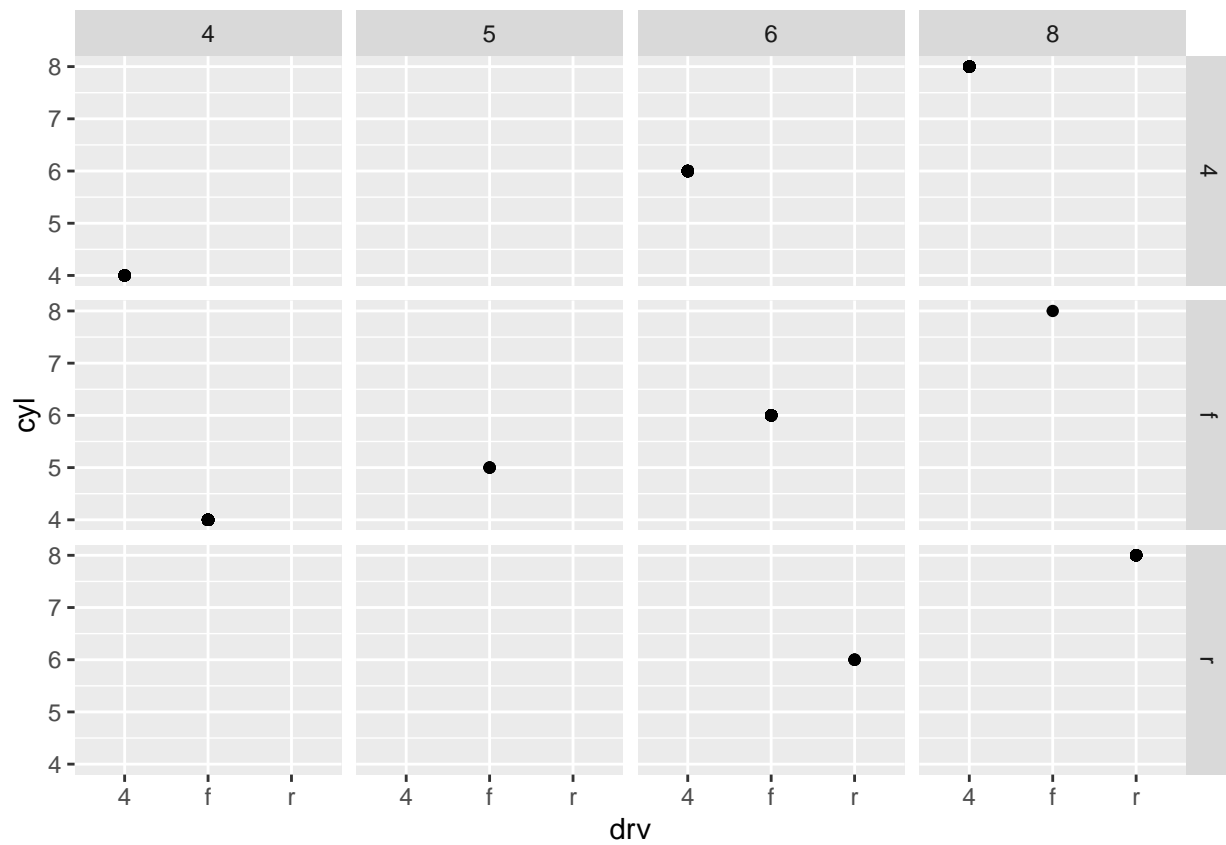


```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  ) +
  facet_grid( . ~ cyl)
```



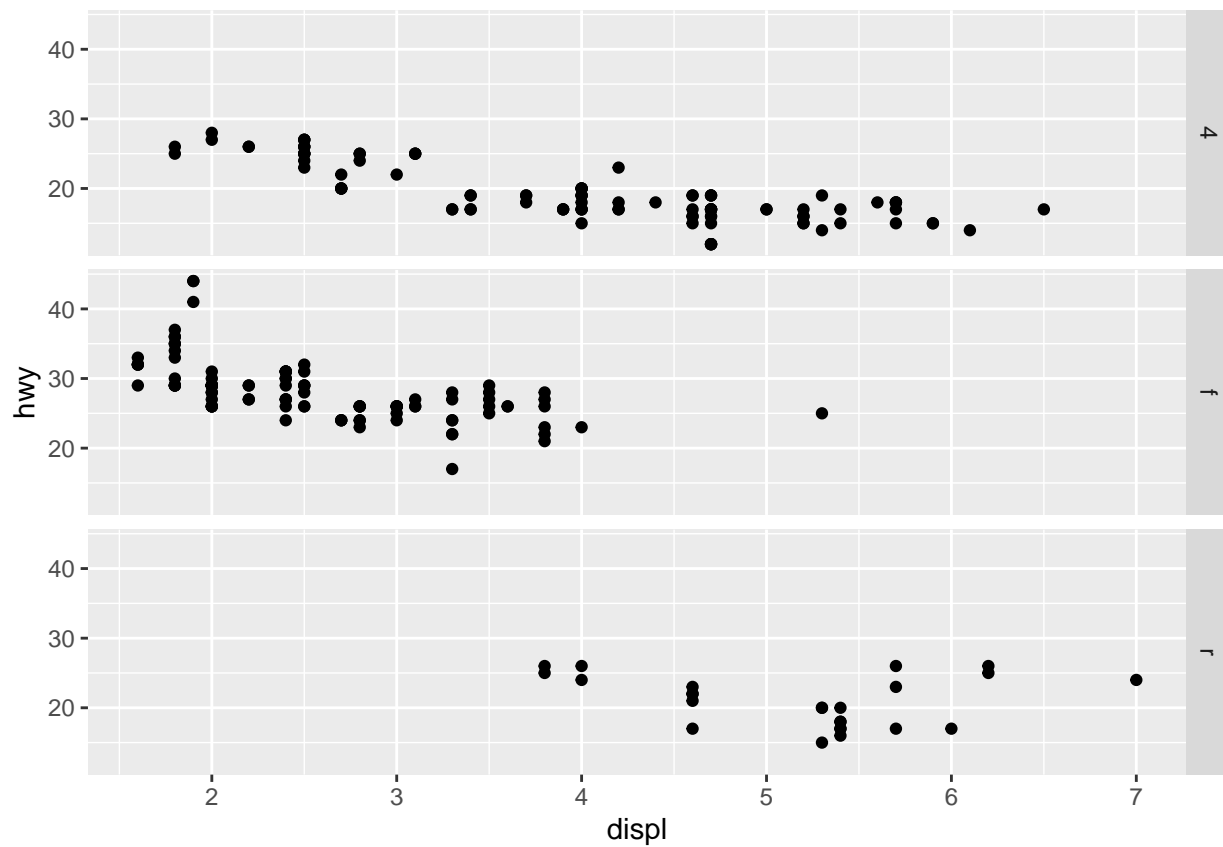
Exercicio 2

```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = drv, y = cyl
    )
  ) +
  facet_grid( drv ~ cyl)
```

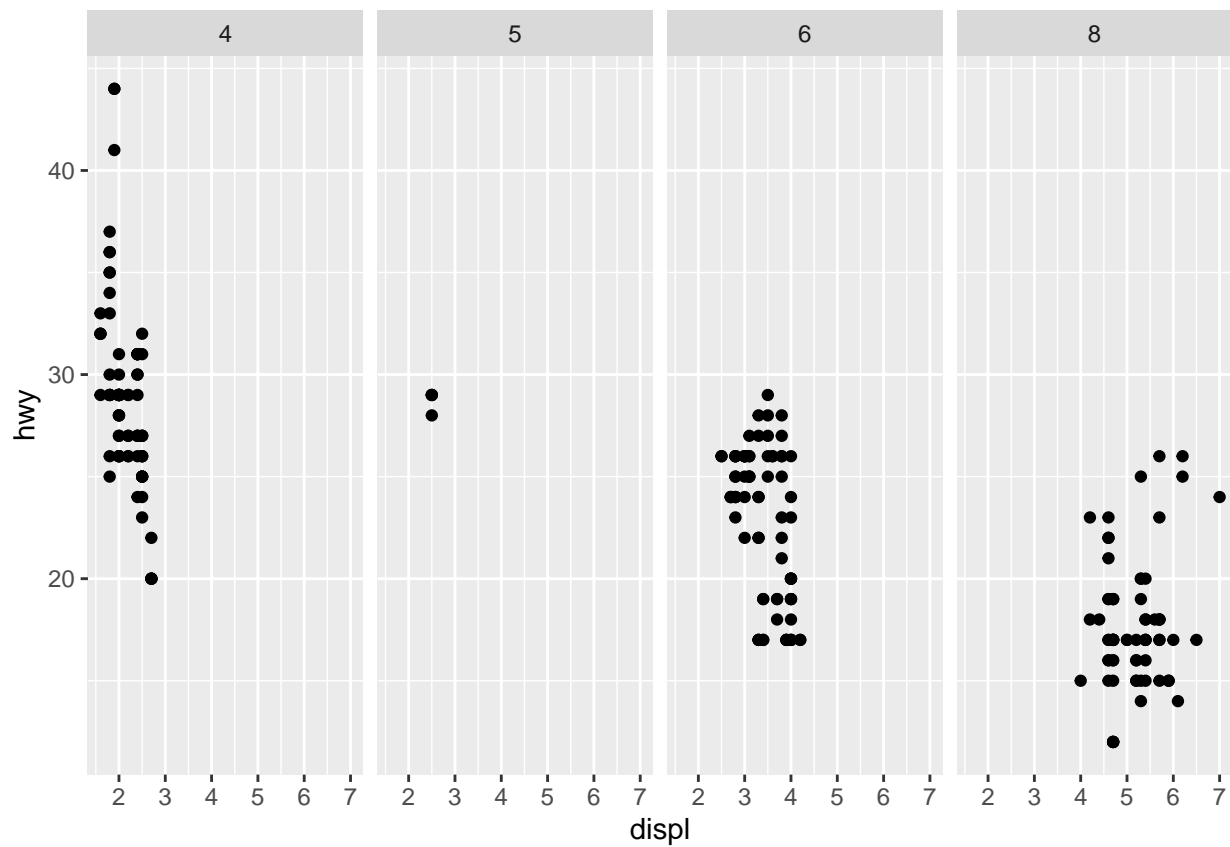


Exercício 3

```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  ) +
  facet_grid(
    drv ~ .
  )
```



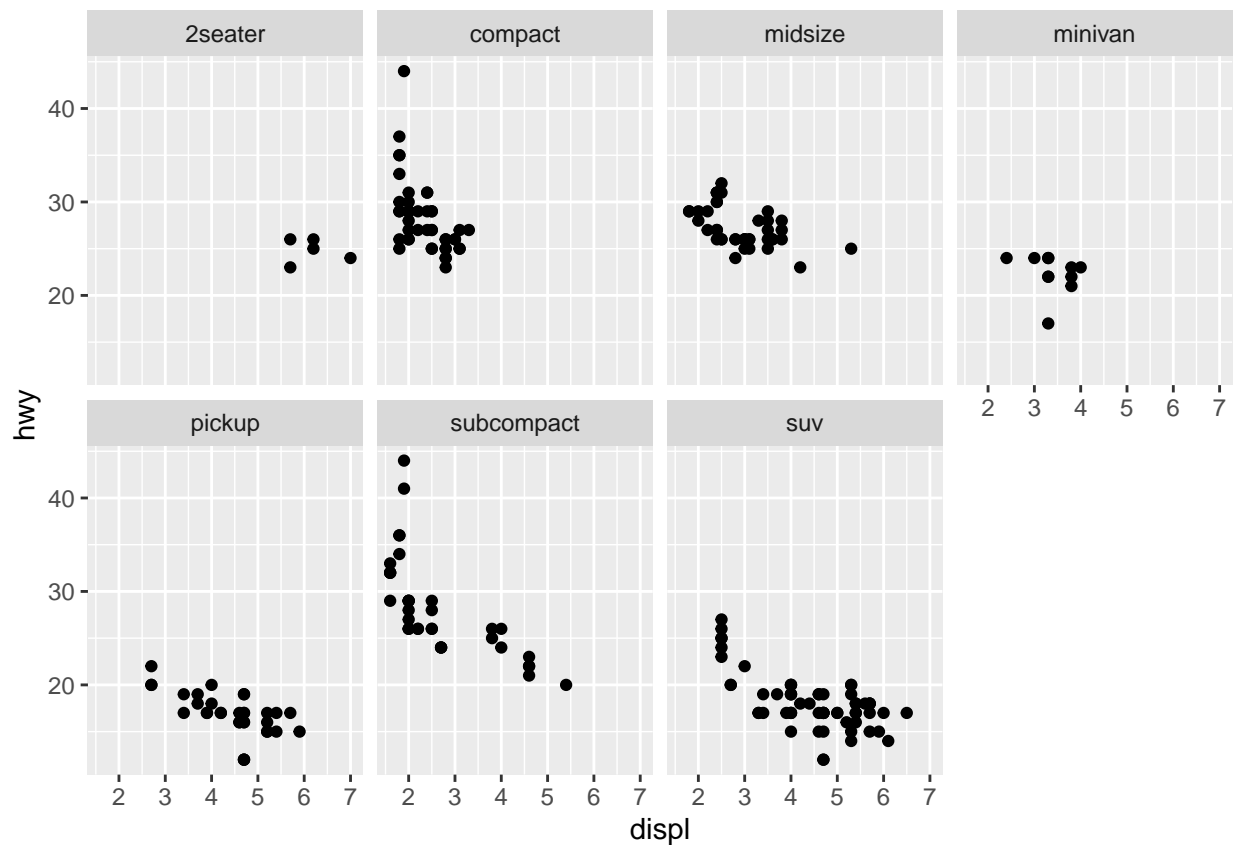
```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  ) +
  facet_grid(
    . ~ cyl
  )
```



Fazendo de acordo com a variável.

Exercicio 4

```
ggplot(data = mpg) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  ) +
  facet_wrap(~ class, ncol = 4)
```



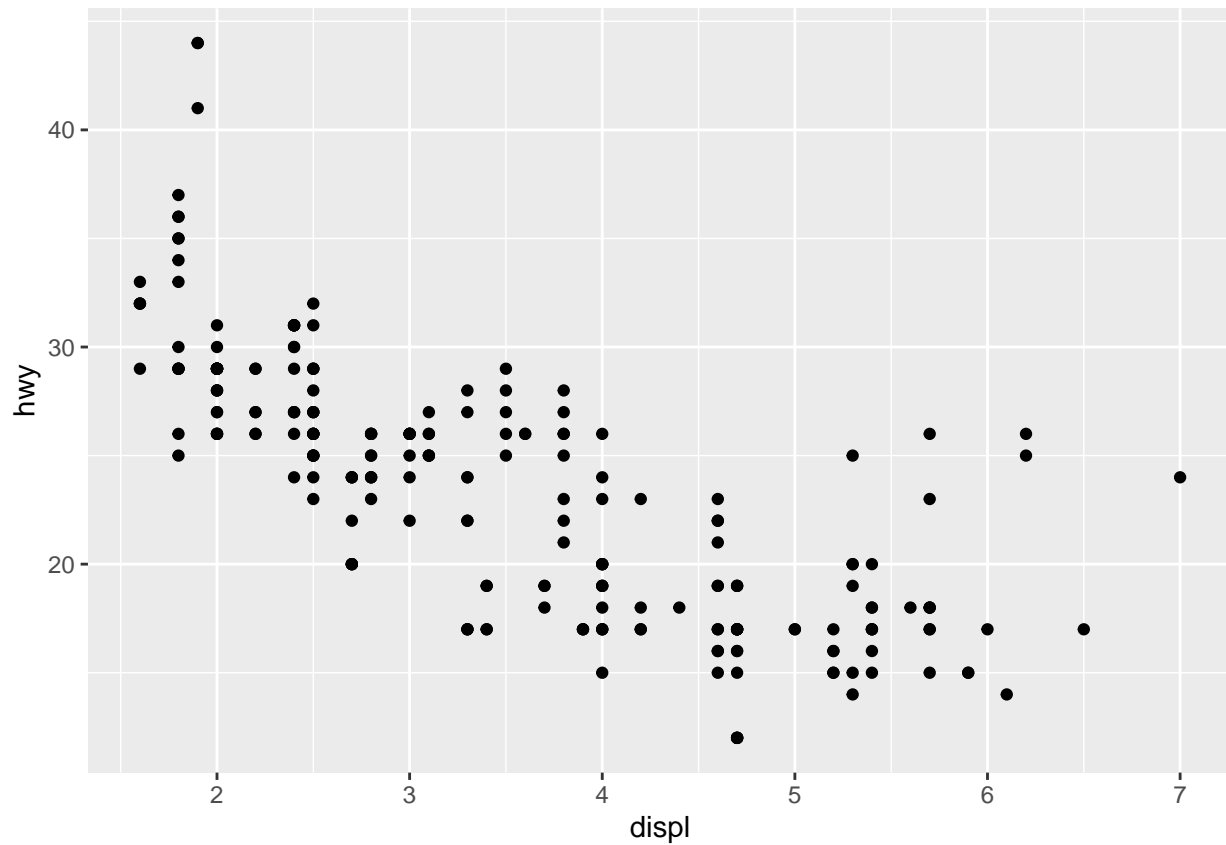
As variáveis ficam isoladas, cada gráfico para cada variável, ao invés de um gráfico para muitas variáveis.

Exercício 5 nrow dividi-se em linhas ncol dividi-se em colunas facet_grid não tem variáveis nrow e ncol pois são de acordo com variáveis as quais você insere de acordo

Objetos geométricos pag 16

left

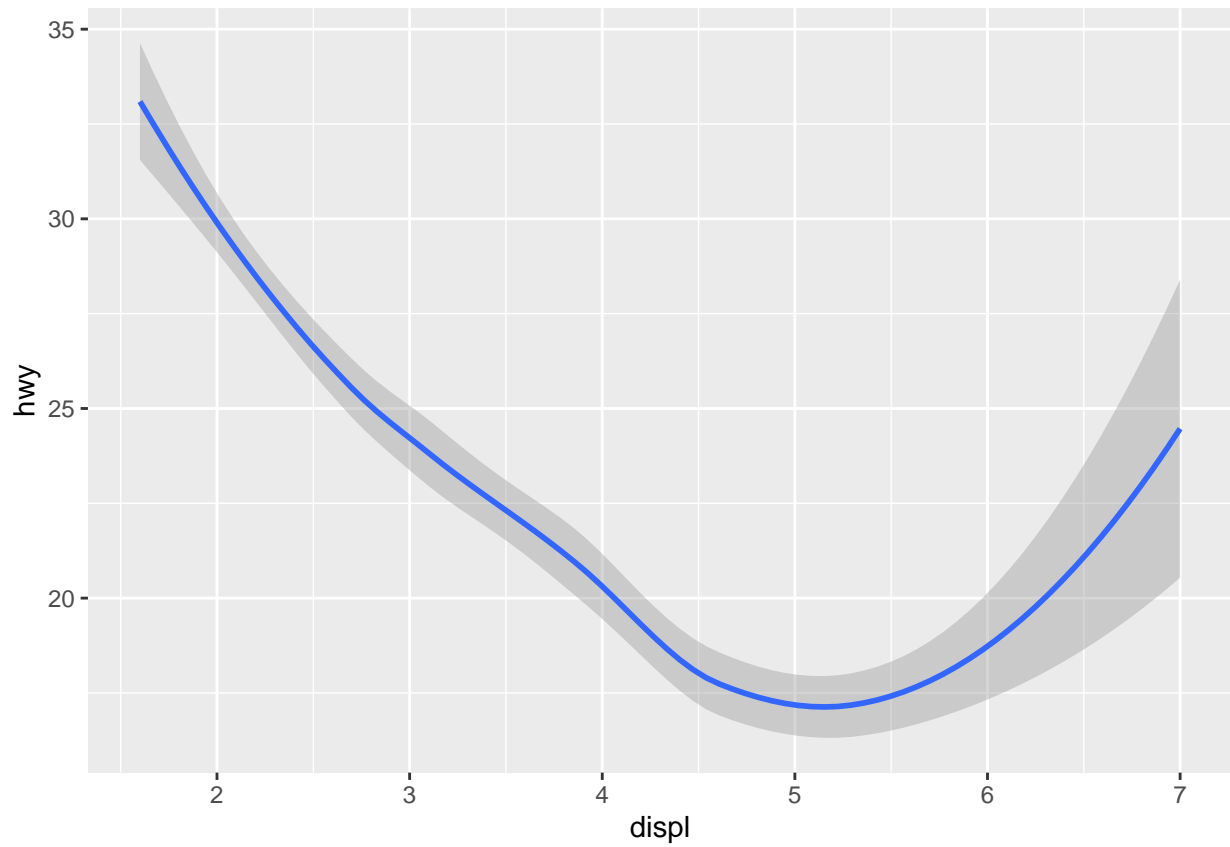
```
ggplot( data = mpg ) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    )
  )
)
```



right

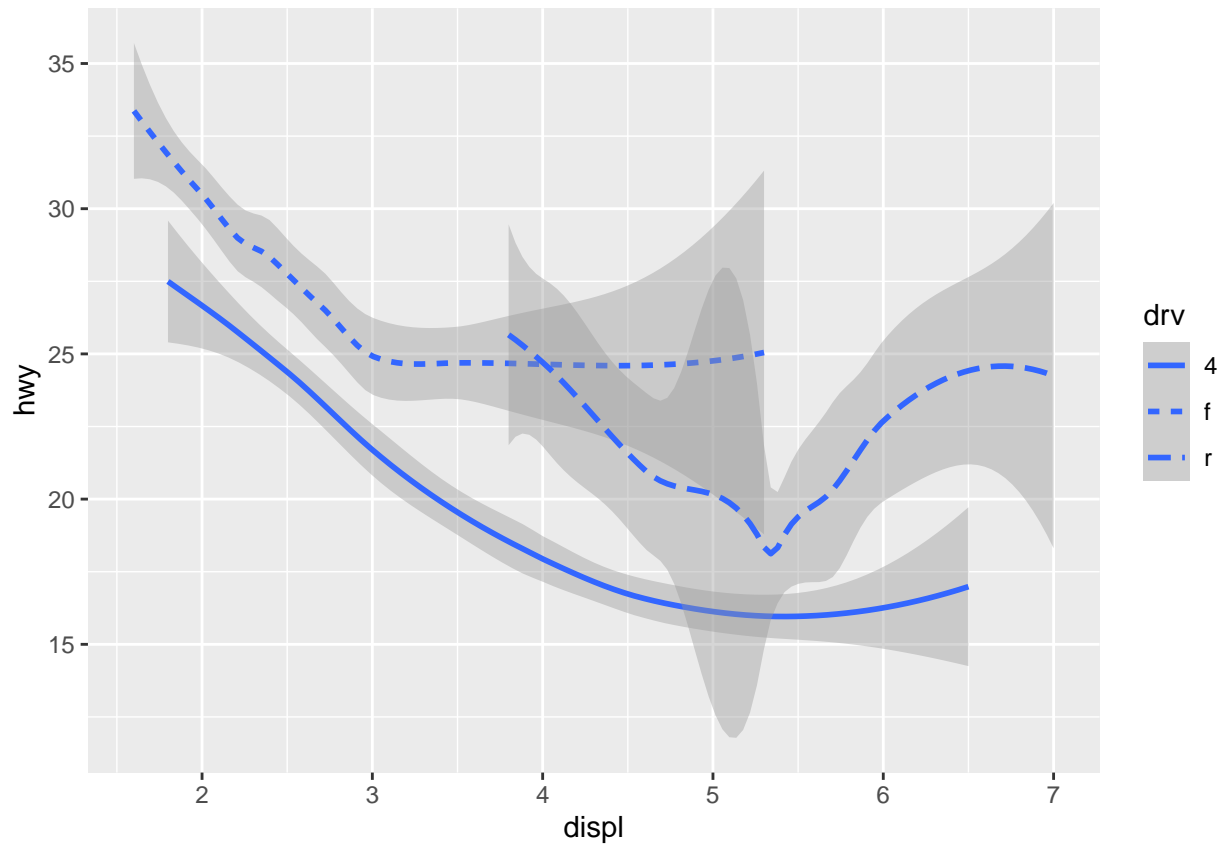
```
ggplot( data = mpg ) +  
  geom_smooth(  
    mapping = aes(  
      x = displ, y = hwy  
    )  
  )  
)
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```

```
ggplot( data = mpg ) +  
  geom_smooth(  
    mapping = aes(  
      x = displ, y = hwy, linetype = drv  
    )  
  )  
)
```

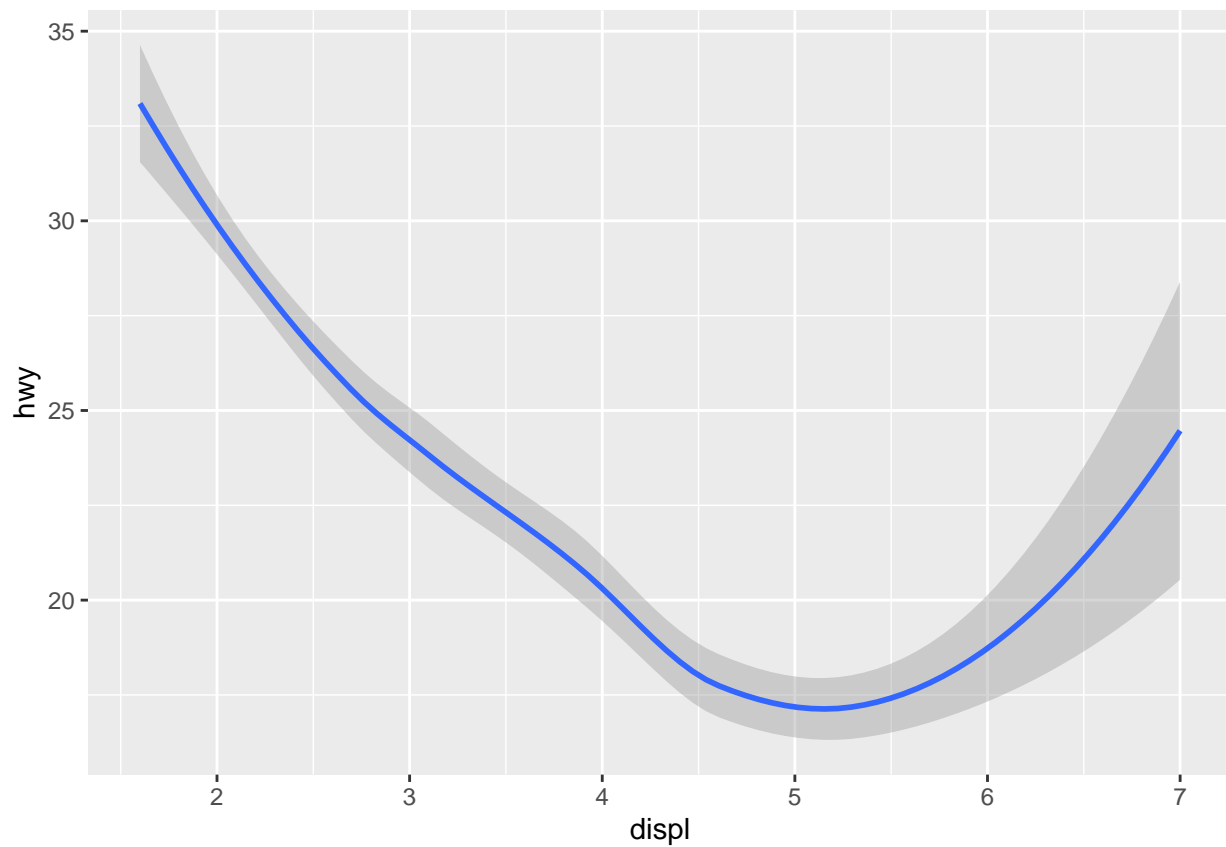
```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



4 quer dizer tração nas quatro rodas f tração dianteira r tração traseira pag 18

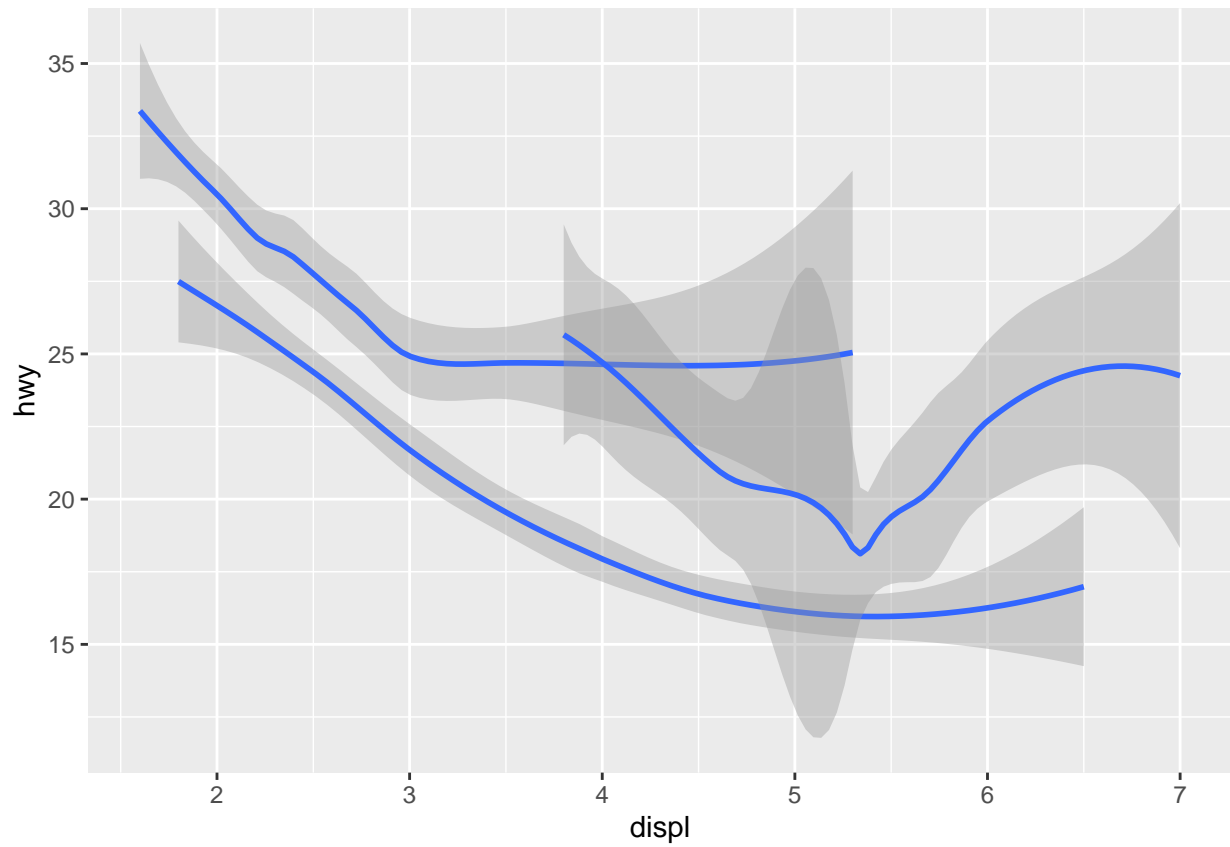
```
ggplot(data = mpg) +
  geom_smooth(
    mapping = aes(
      x = displ, y = hwy
    )
  )
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



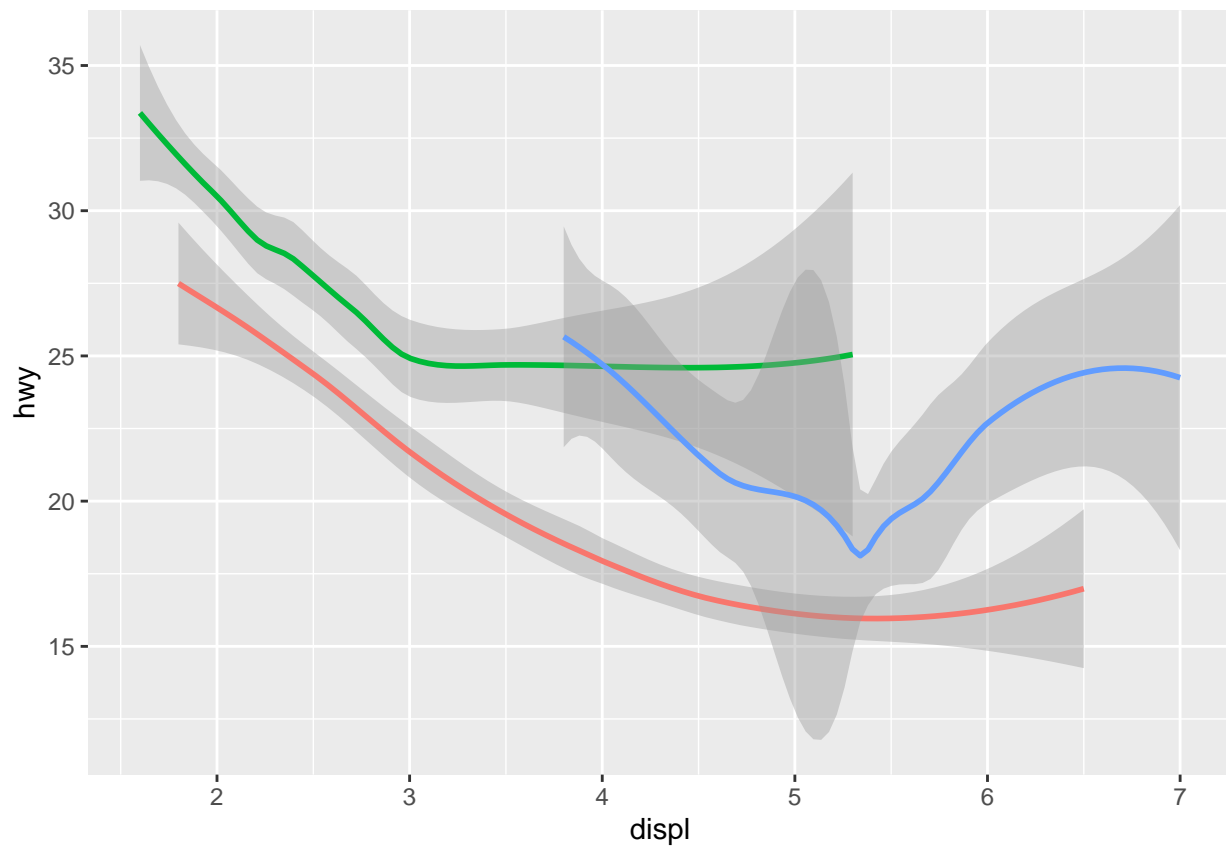
```
ggplot( data = mpg ) +  
  geom_smooth(  
    mapping = aes(  
      x = displ, y = hwy, group = drv  
    )  
  )  
)
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



```
ggplot( data = mpg) +  
  geom_smooth(  
    mapping = aes(  
      x = displ, y = hwy, color = drv  
    ),  
    show.legend = FALSE  
  )
```

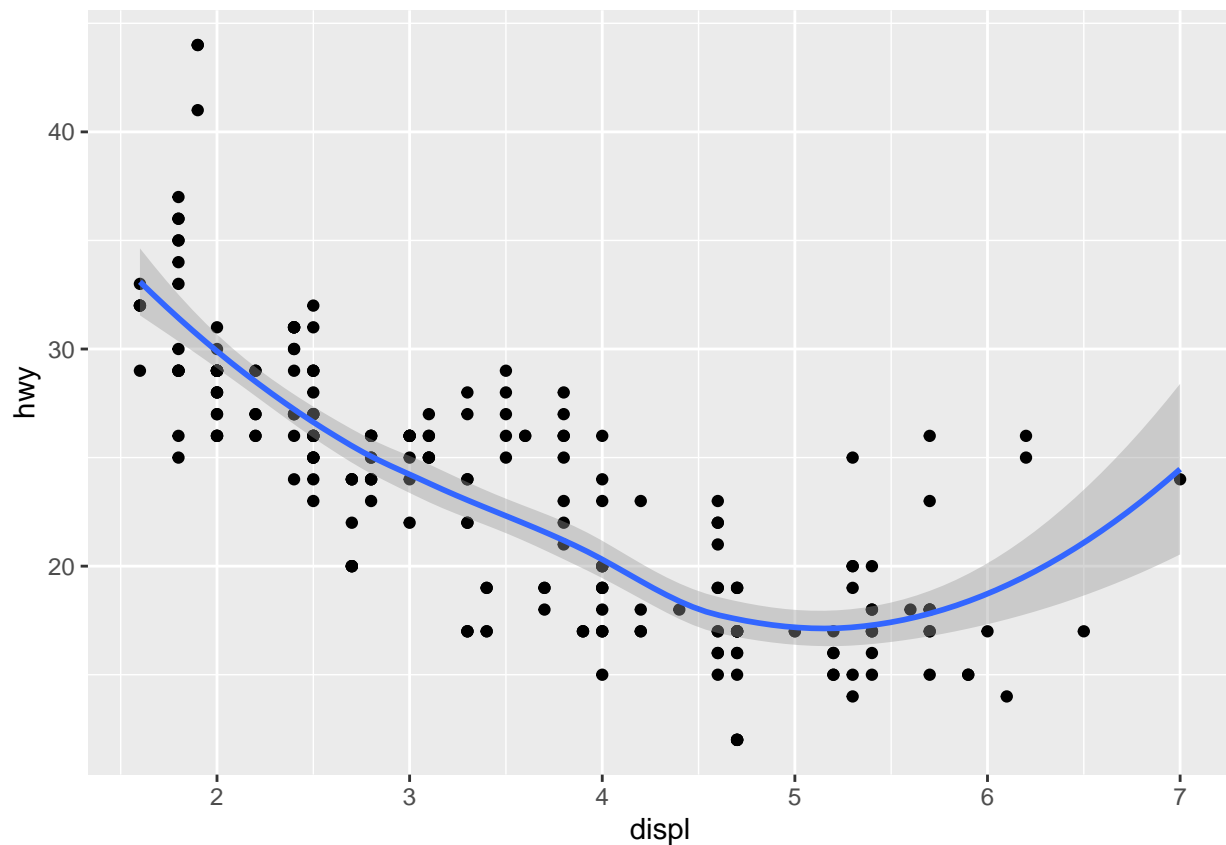
```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



Para exibir vários geoms no mesmo gráfico

```
ggplot(data = mpg) +  
  geom_point(  
    mapping = aes(  
      x = displ, y = hwy  
    )  
  ) +  
  geom_smooth(  
    mapping = aes(  
      x = displ, y = hwy  
    )  
  )  
)
```

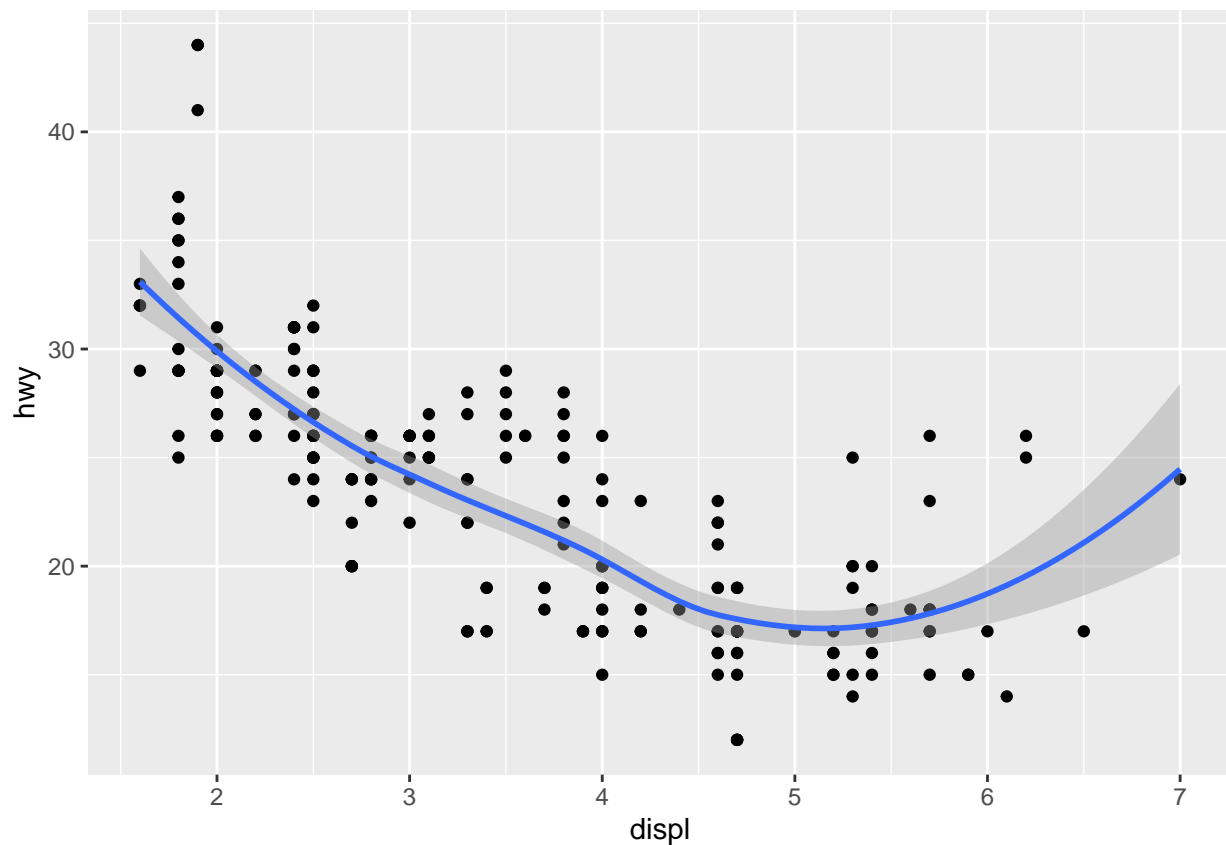
```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



duplicação de código, pois estou plotando os mesmo dados em dois tipos de gráficos diferentes péssimo para manutenção do código.. o mais correto seria.

```
ggplot(  
  data = mpg, mapping = aes(  
    x = displ, y = hwy  
  )  
) +  
  geom_point() +  
  geom_smooth()
```

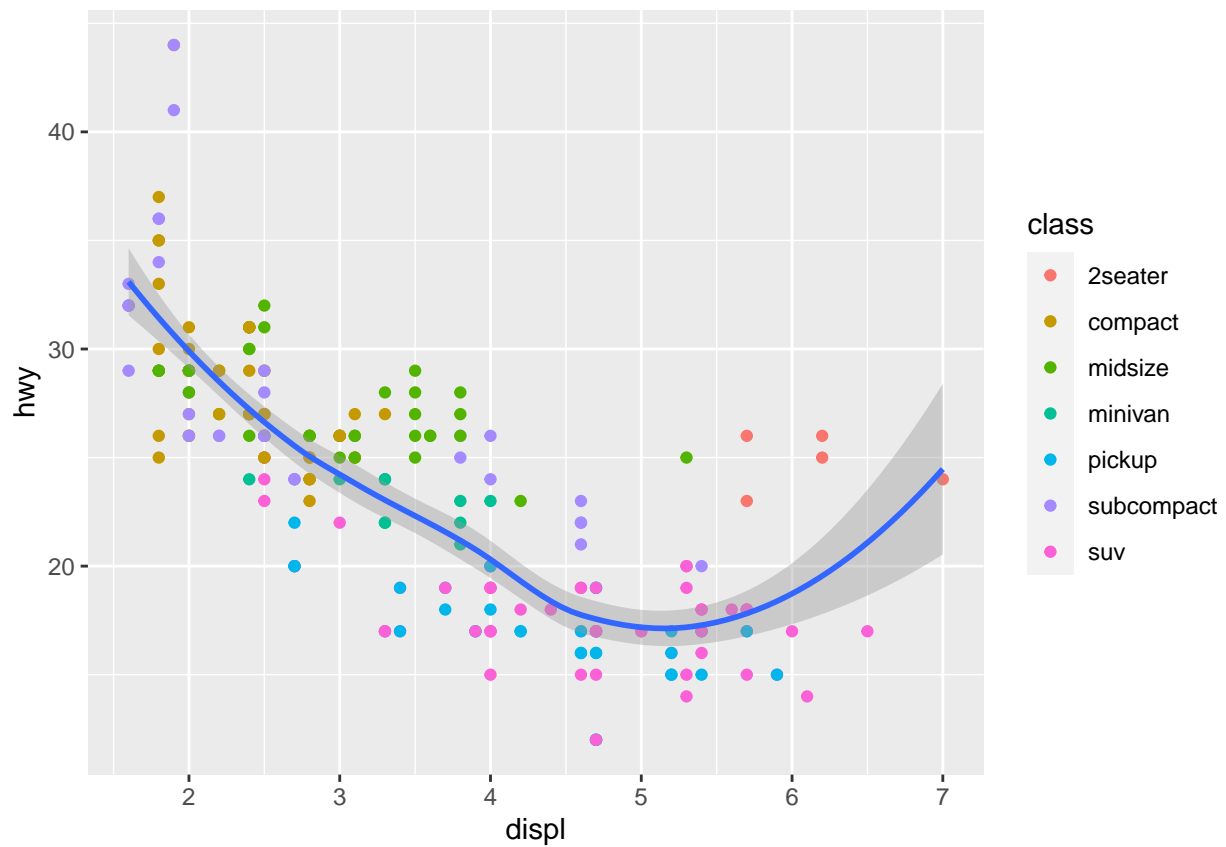
```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



para limpeza do código, é o mais correto..podemos modificar umas das propriedades

```
ggplot(
  data = mpg, mapping = aes(
    x = displ, y = hwy
  )
) +
  geom_point(
    mapping = aes(
      color = class
    )
  ) +
  geom_smooth()
```

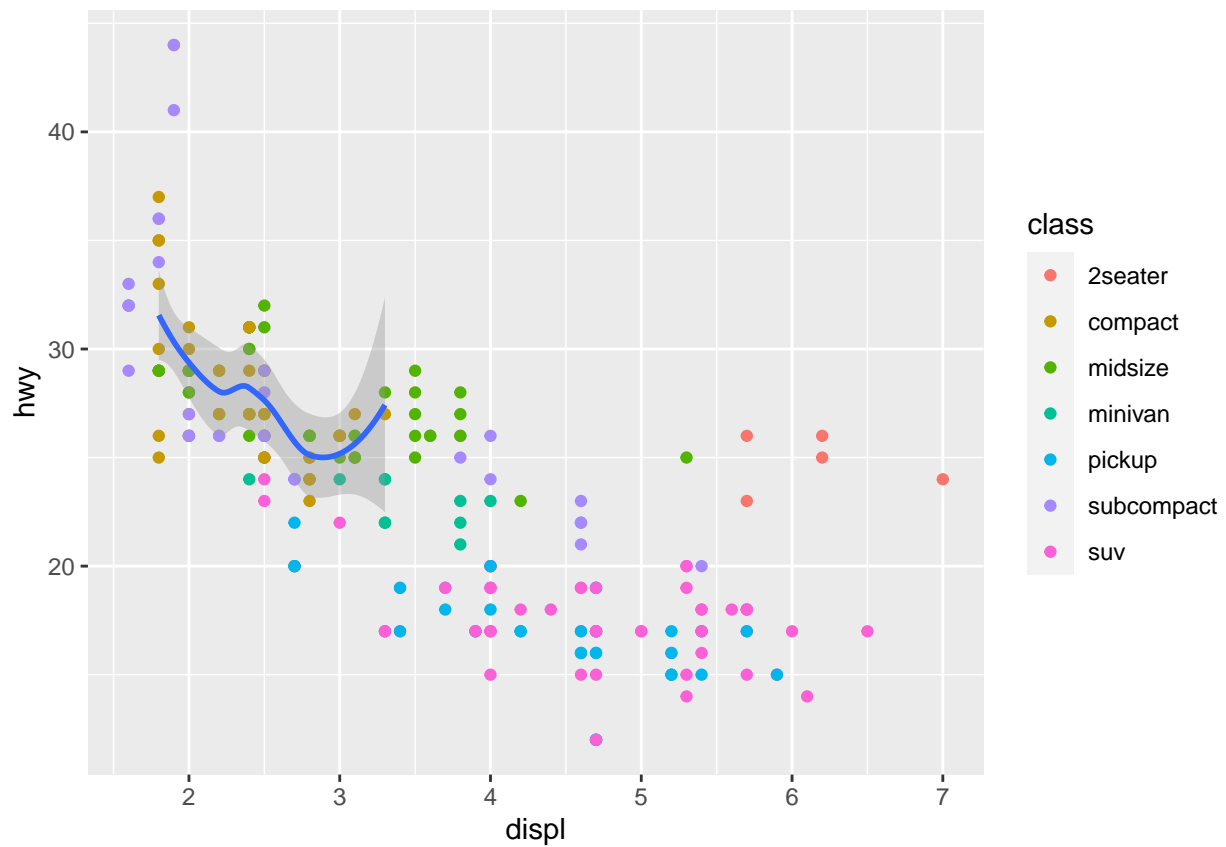
```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



pag 20 usando filter

```
ggplot(
  data = mpg, mapping = aes(
    x = displ, y = hwy
  )
) +
  geom_point(
    mapping = aes(
      color = class
    )
  ) +
  geom_smooth(
    data = filter(
      mpg, class == "compact"
    ), se = TRUE
  )
```

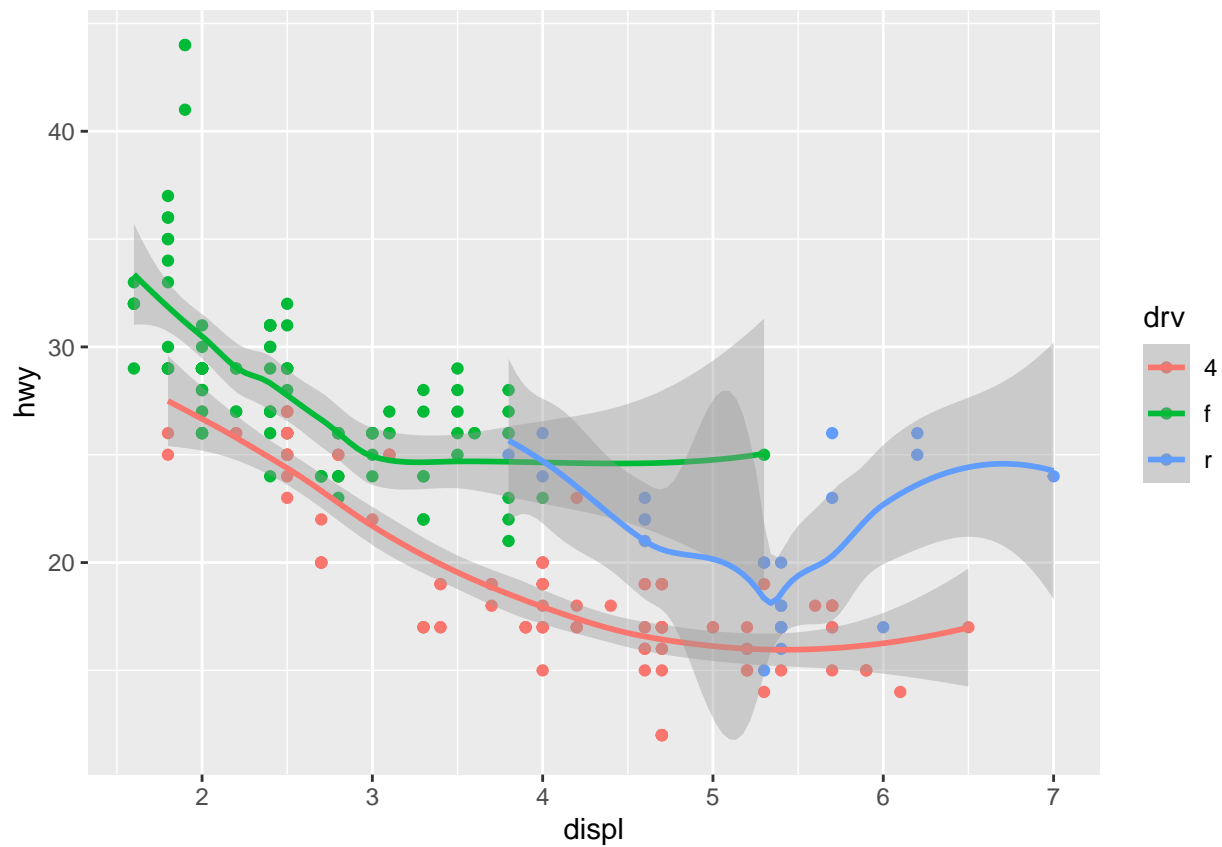
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'



exercício 2

```
ggplot(
  data = mpg,
  mapping = aes(
    x = displ, y = hwy, color = drv
  )
) +
  geom_point() +
  geom_smooth(
    se = TRUE
  )
```

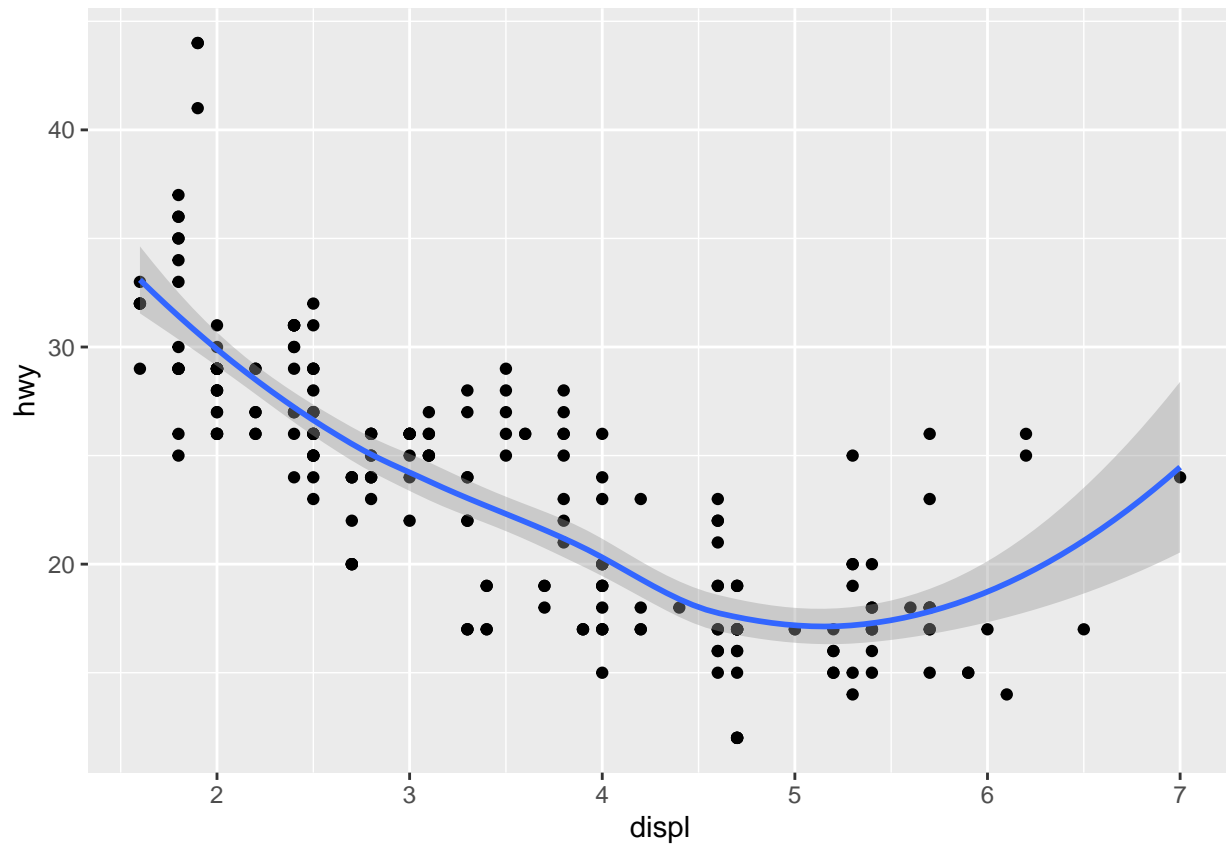
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'



exercício 5

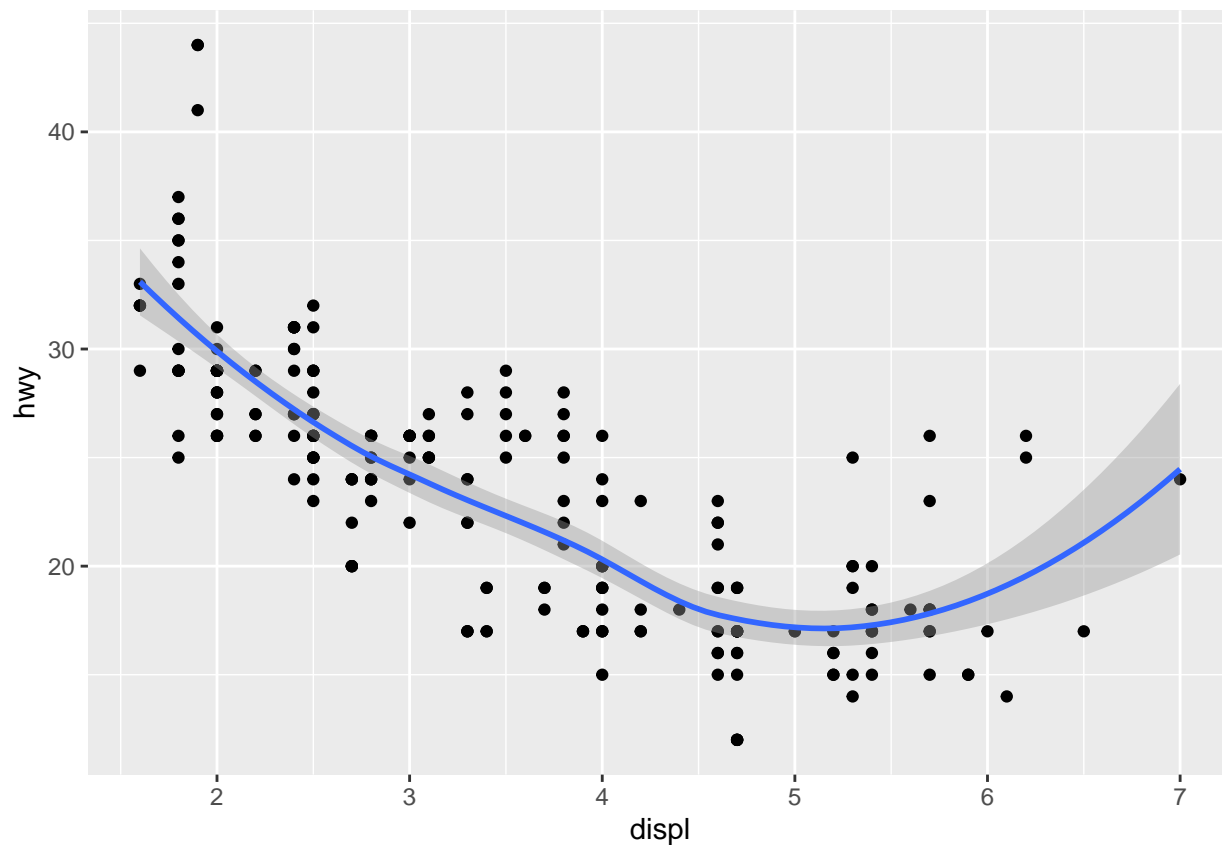
```
ggplot(
  data = mpg, mapping = aes(
    x = displ, y = hwy
  )) +
  geom_point() +
  geom_smooth()

## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



```
ggplot() +  
  geom_point(  
    data = mpg, mapping = aes(  
      x = displ, y = hwy  
    )) +  
  geom_smooth(  
    data = mpg,  
    mapping = aes(  
      x = displ, y = hwy  
    )  
  )  
)
```

```
## `geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```



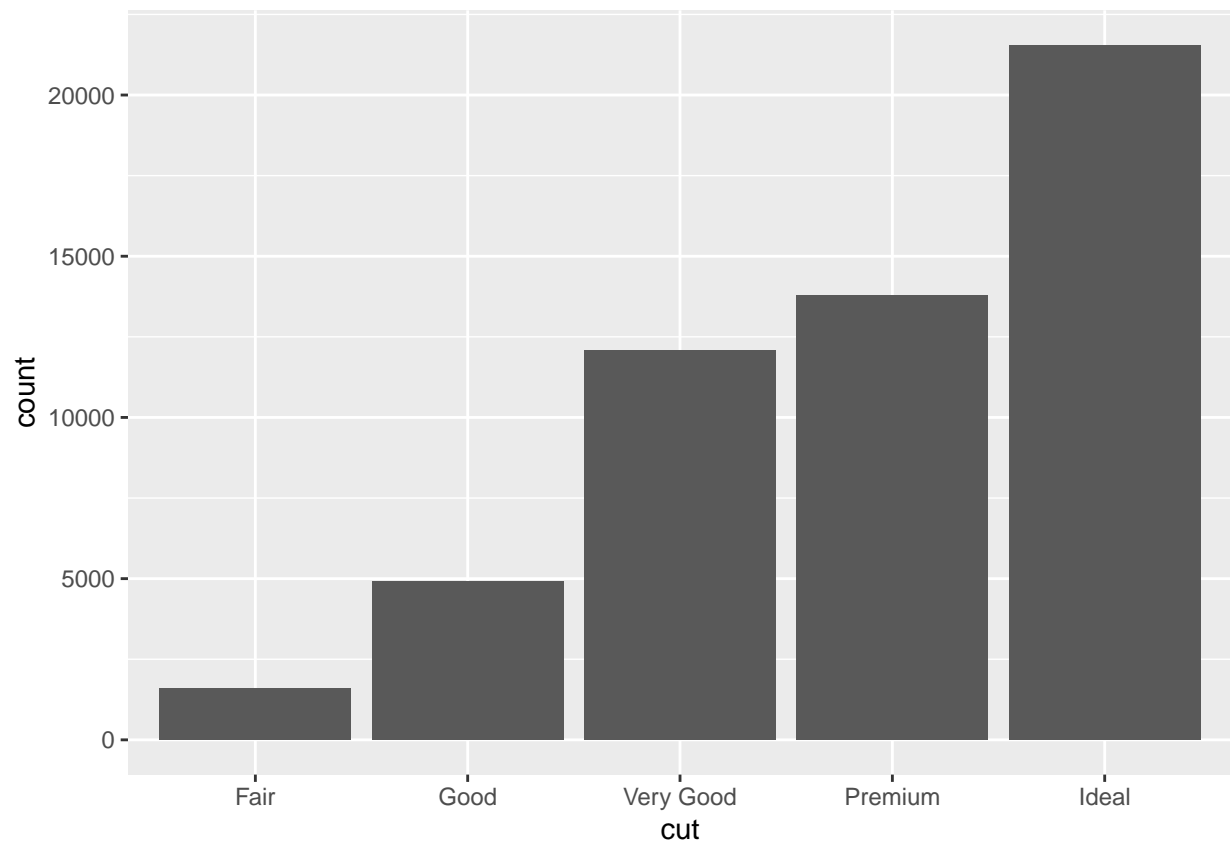
não existe diferença nos dois gráficos.

transformações estatísticas pag 22

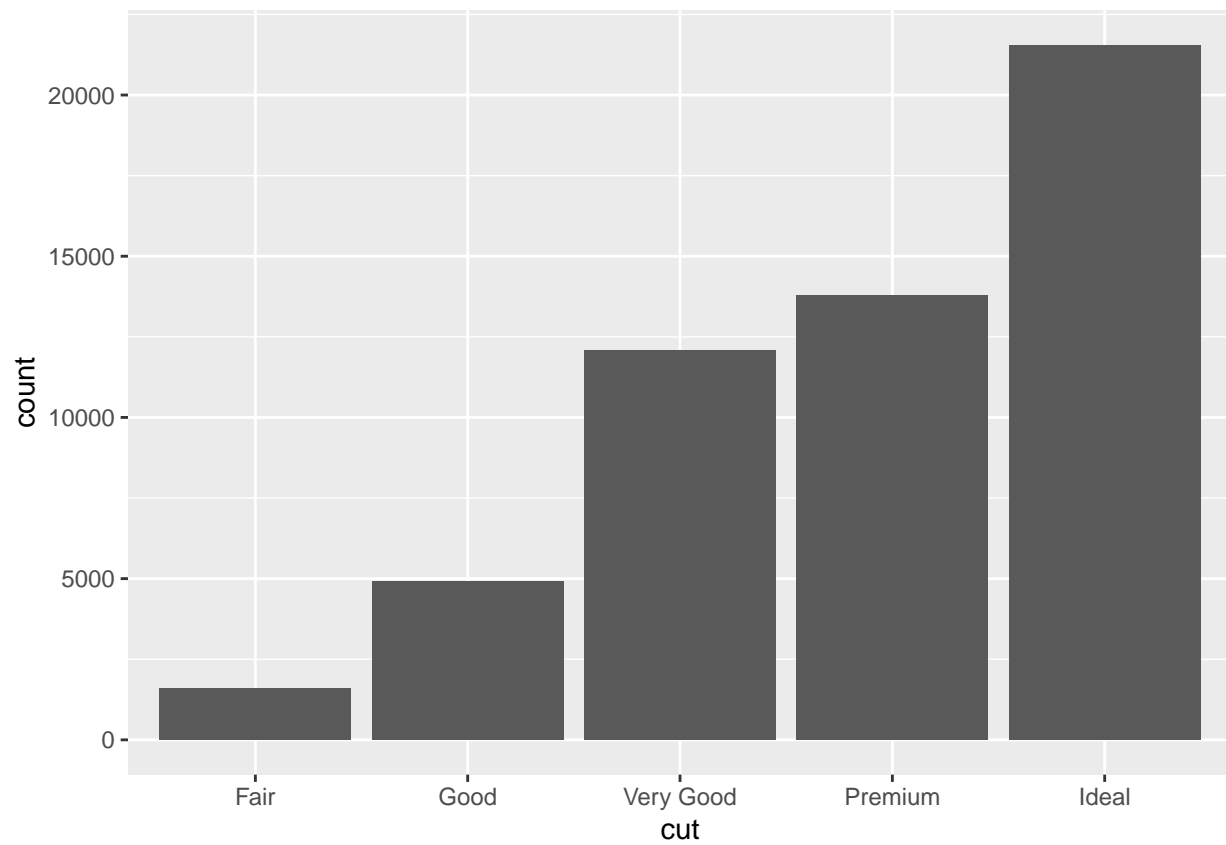
diamonds

```
## # A tibble: 53,940 x 10
##   carat cut      color clarity depth table price      x      y      z
##   <dbl> <ord>    <ord> <ord>  <dbl> <dbl> <int> <dbl> <dbl> <dbl>
## 1  0.23 Ideal      E    SI2    61.5   55   326  3.95  3.98  2.43
## 2  0.21 Premium    E    SI1    59.8   61   326  3.89  3.84  2.31
## 3  0.23 Good       E    VS1    56.9   65   327  4.05  4.07  2.31
## 4  0.29 Premium    I    VS2    62.4   58   334  4.2   4.23  2.63
## 5  0.31 Good       J    SI2    63.3   58   335  4.34  4.35  2.75
## 6  0.24 Very Good J    VVS2    62.8   57   336  3.94  3.96  2.48
## 7  0.24 Very Good I    VVS1    62.3   57   336  3.95  3.98  2.47
## 8  0.26 Very Good H    SI1    61.9   55   337  4.07  4.11  2.53
## 9  0.22 Fair       E    VS2    65.1   61   337  3.87  3.78  2.49
## 10 0.23 Very Good H    VS1    59.4   61   338  4     4.05  2.39
## # i 53,930 more rows
```

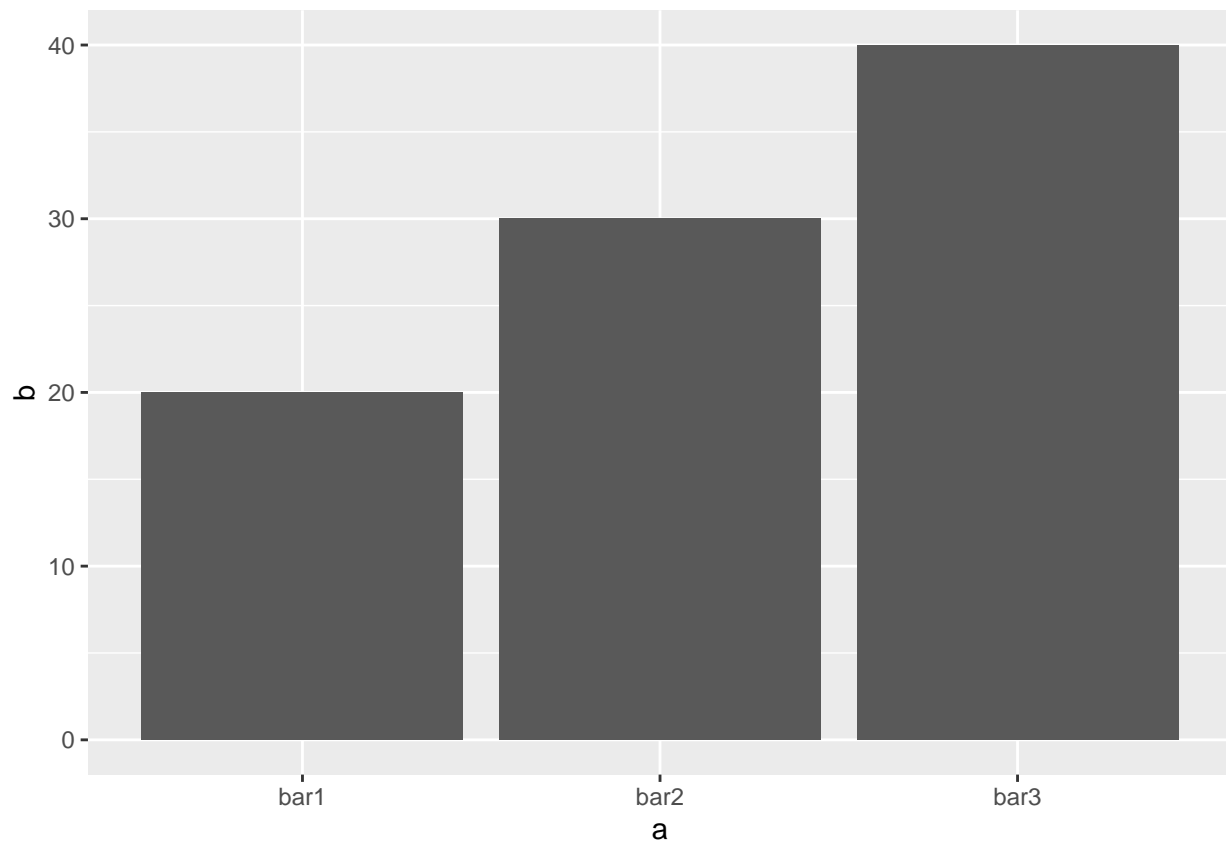
```
ggplot(data = diamonds) +
  geom_bar(mapping = aes(
    x = cut
  ))
```



```
ggplot(  
  data = diamonds  
) +  
  stat_count(mapping = aes(  
    x = cut  
  ))
```

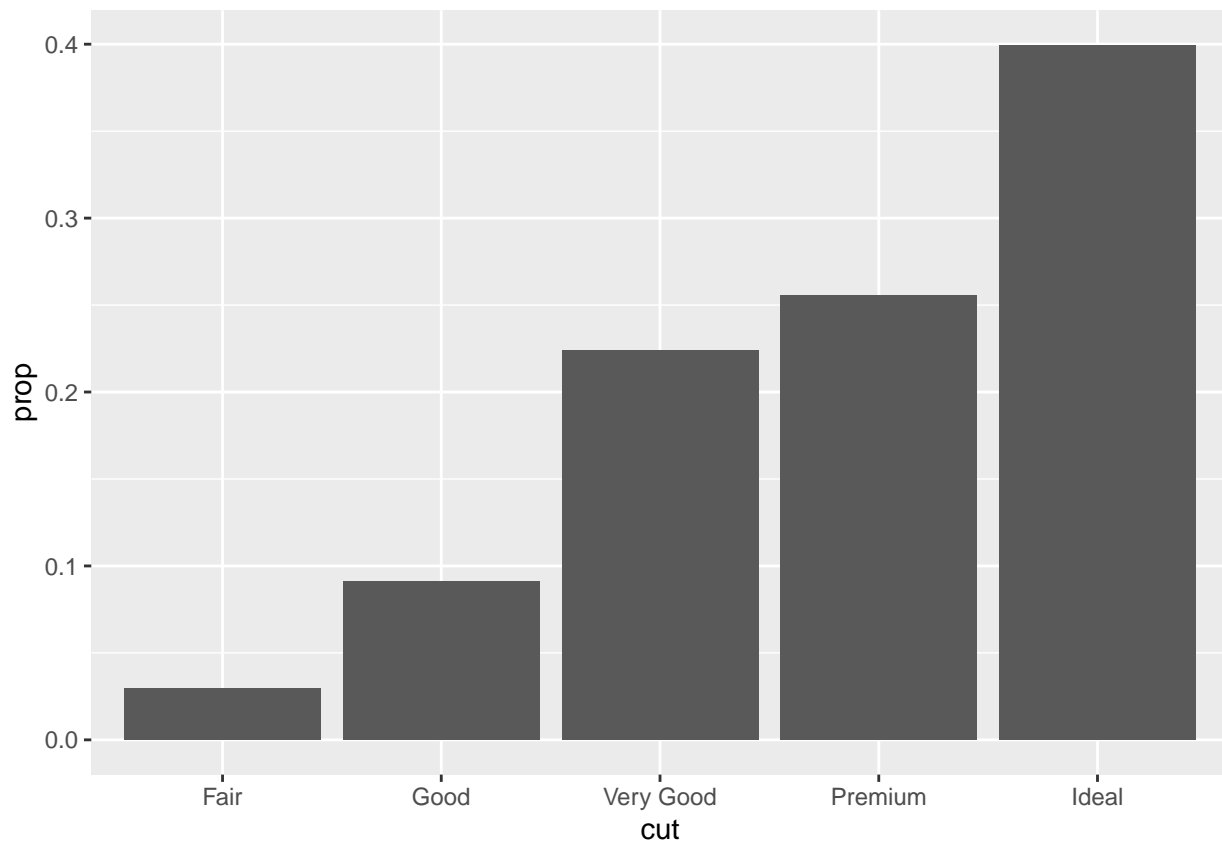


```
demo <- tribble(  
  ~a, ~b,  
  "bar1", 20,  
  "bar2", 30,  
  "bar3", 40  
)  
ggplot(data = demo) +  
  geom_bar(  
    mapping = aes(  
      x = a, y = b  
    ), stat = "identity"  
  )
```



```
ggplot(  
  data = diamonds  
) +  
  geom_bar(  
    mapping = aes(  
      x = cut, y = ..prop.., group = 1  
    )  
  )  
)
```

```
## Warning: The dot-dot notation (`..prop..`) was deprecated in ggplot2 3.4.0.  
## i Please use `after_stat(prop)` instead.  
## This warning is displayed once every 8 hours.  
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was  
## generated.
```

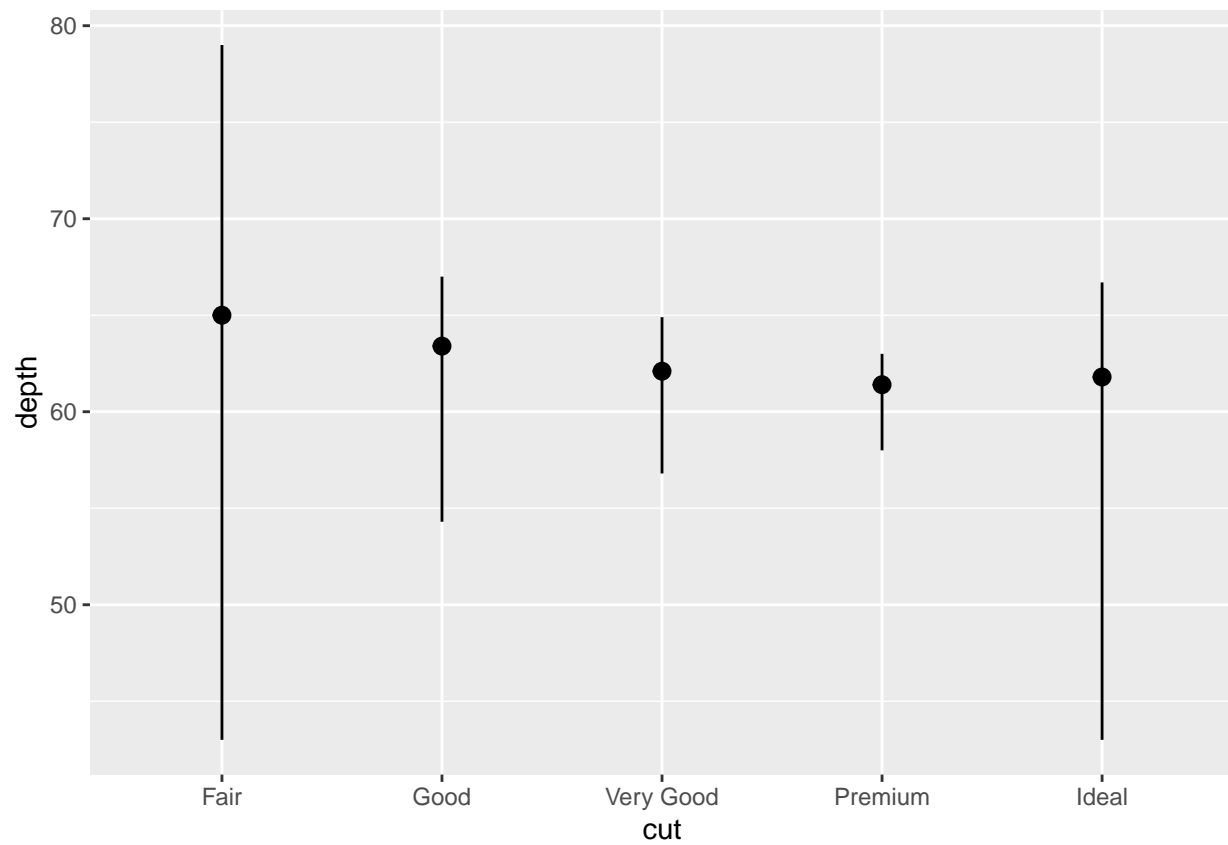


```
ggplot(data = diamonds) +
  stat_summary(
    mapping = aes(
      x = cut, y = depth
    ),
    fun.ymin = min,
    fun.ymax = max,
    fun.y = median
  )
```

```
## Warning: The `fun.y` argument of `stat_summary()` is deprecated as of ggplot2 3.3.0.
## i Please use the `fun` argument instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

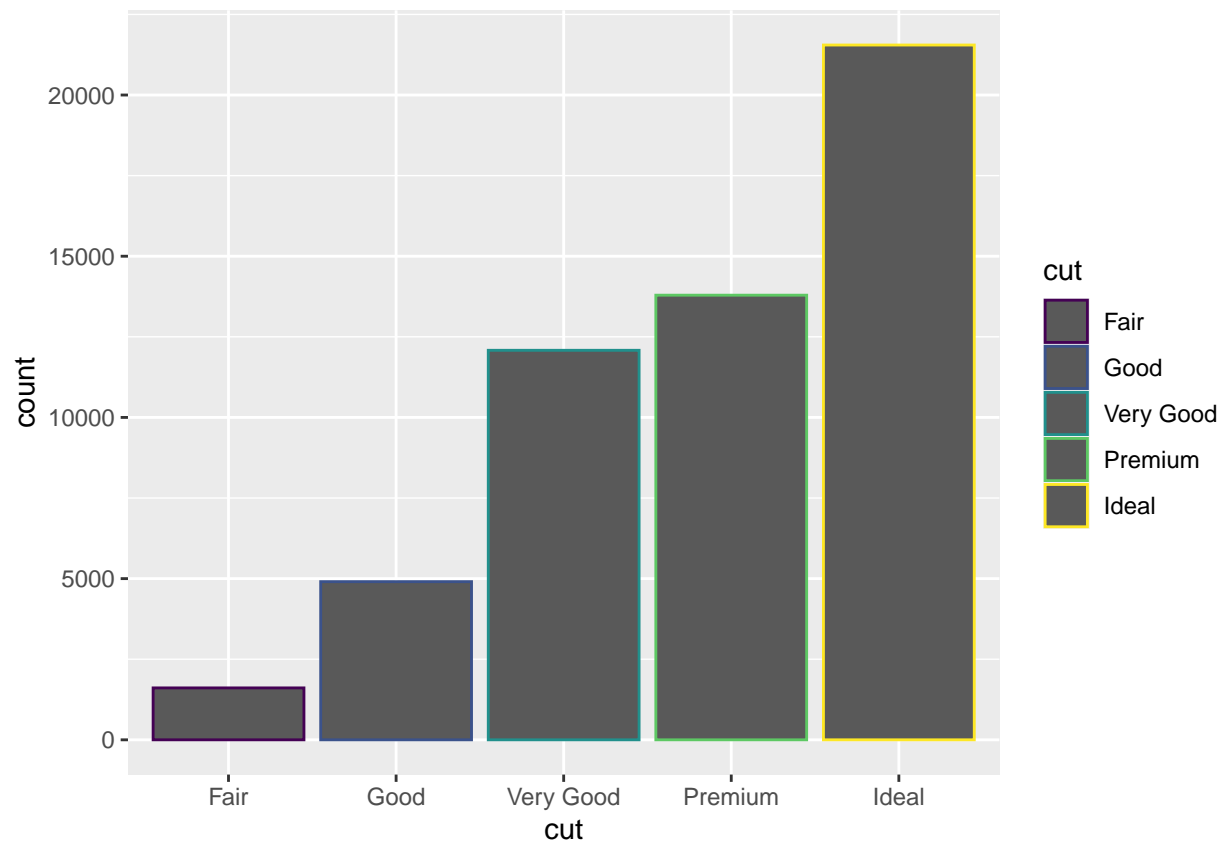
```
## Warning: The `fun.ymin` argument of `stat_summary()` is deprecated as of ggplot2 3.3.0.
## i Please use the `fun.min` argument instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

```
## Warning: The `fun.ymax` argument of `stat_summary()` is deprecated as of ggplot2 3.3.0.
## i Please use the `fun.max` argument instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```

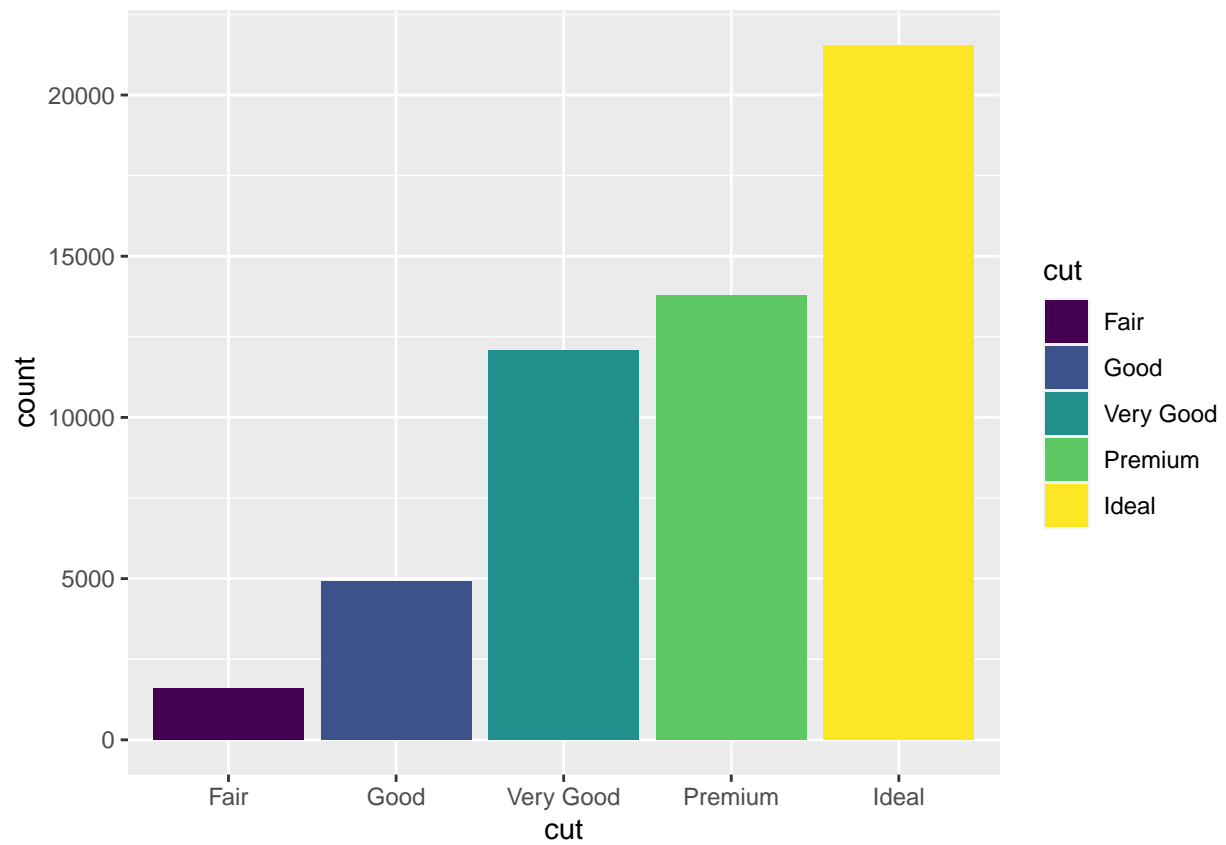



ajustes de posição pg 27

```
ggplot(data = diamonds) +  
  geom_bar(  
    mapping = aes(  
      x = cut, color = cut  
    )  
  )  
)
```

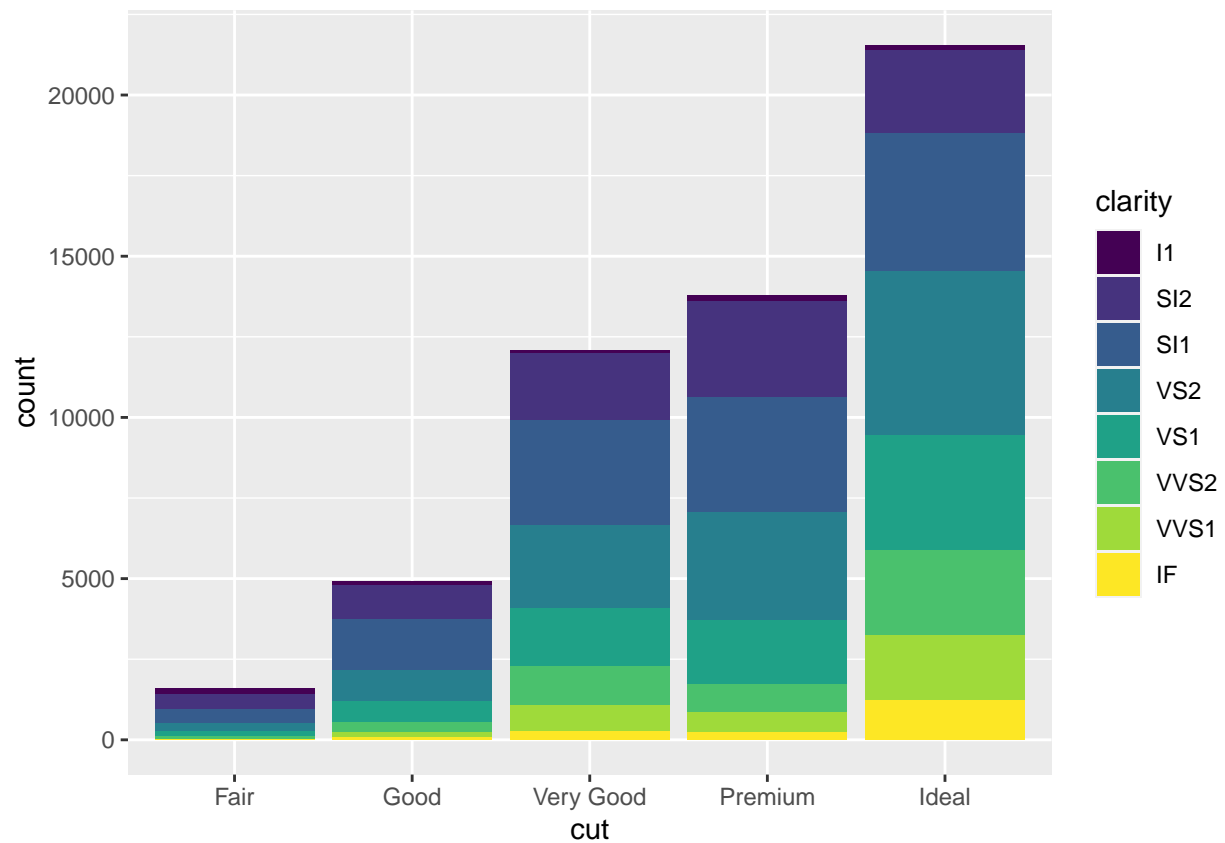


```
ggplot(data = diamonds) +  
  geom_bar(  
    mapping = aes(  
      x = cut, fill = cut  
    )  
  )  
)
```

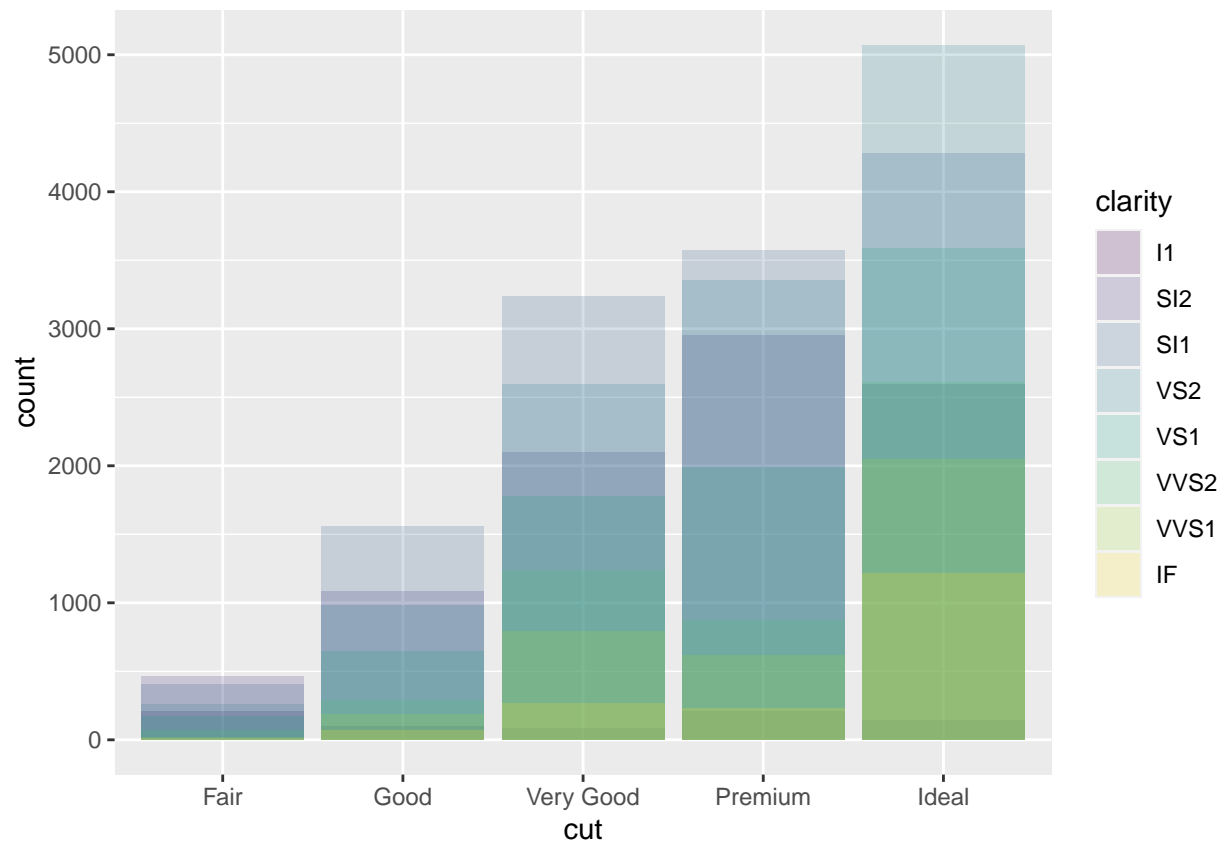


não consigo exibir os dois graficos ao mesmo tempo

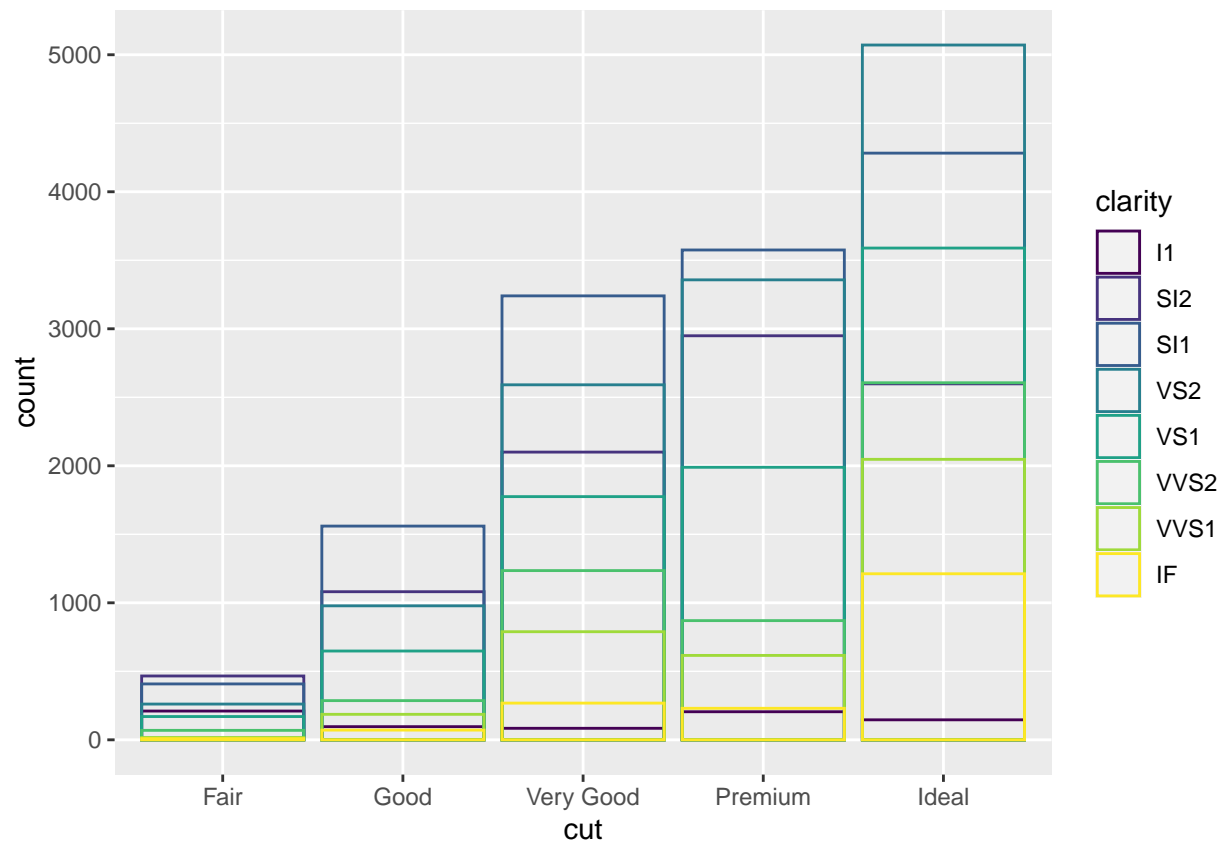
```
ggplot( data = diamonds ) +  
  geom_bar(  
    mapping = aes(  
      x = cut, fill = clarity  
    )  
  )  
)
```



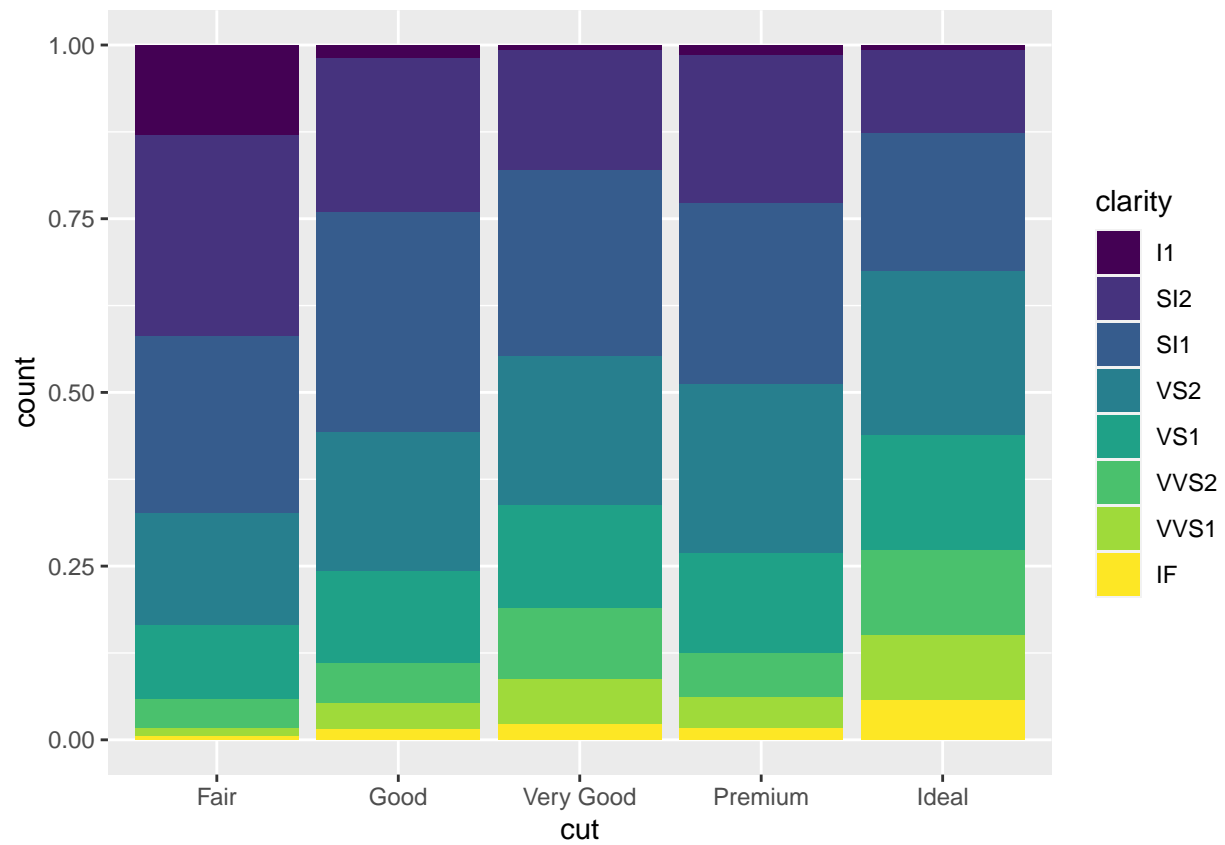
```
ggplot(
  data = diamonds,
  mapping = aes(
    x = cut, fill = clarity
  )
) +
  geom_bar(
    alpha = 1/5, position = "identity" #inutil para grafico de barras, pois sobrepõe
  )
```



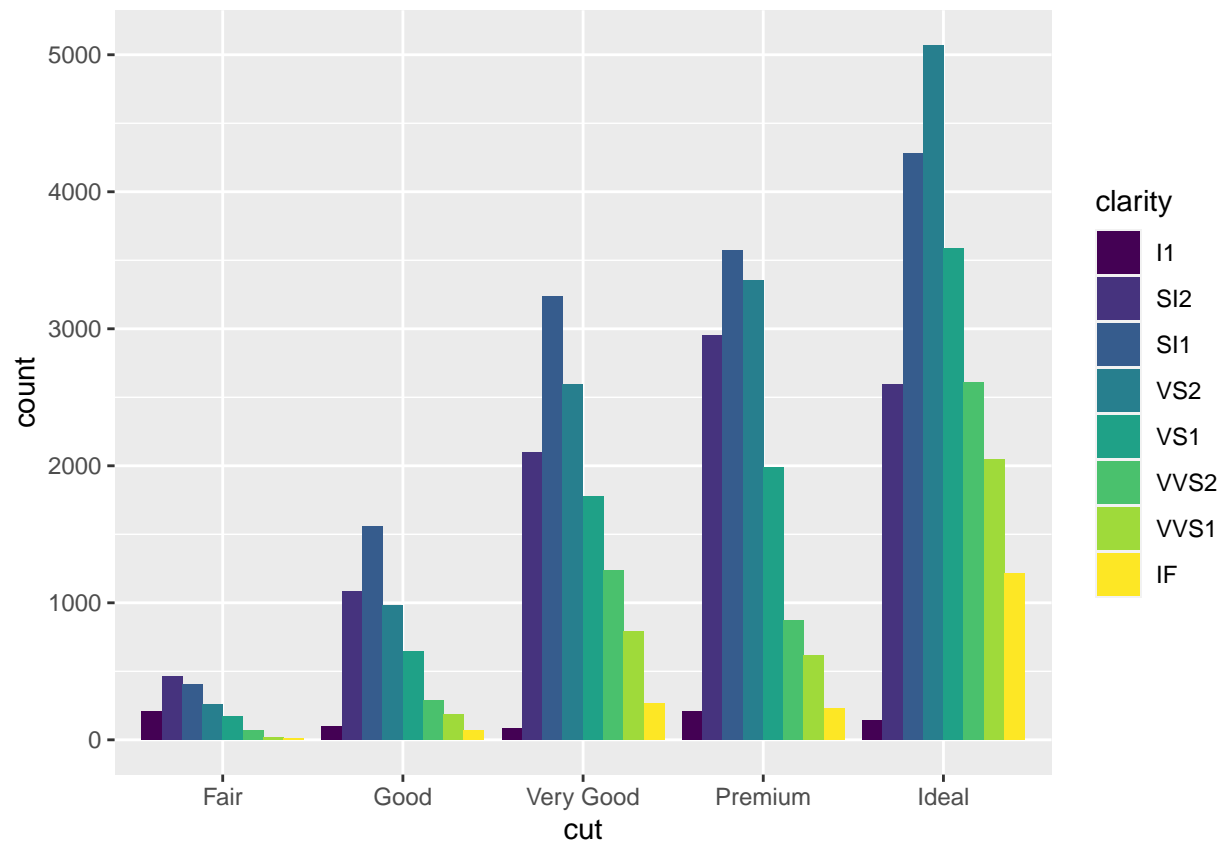
```
ggplot(
  data = diamonds,
  mapping = aes(
    x = cut, color = clarity
  )
) +
  geom_bar(
    fill = NA, position = "identity" #fill = NA, torna-o completamente trasparente
  )
```



```
ggplot(
  data = diamonds
) +
  geom_bar(
    mapping = aes(
      x = cut, fill = clarity
    ), position = "fill" # position fill fica todo preenchido
    #fill funciona como empilhamento da mesma altura, facilita comparar proporções
  )
```

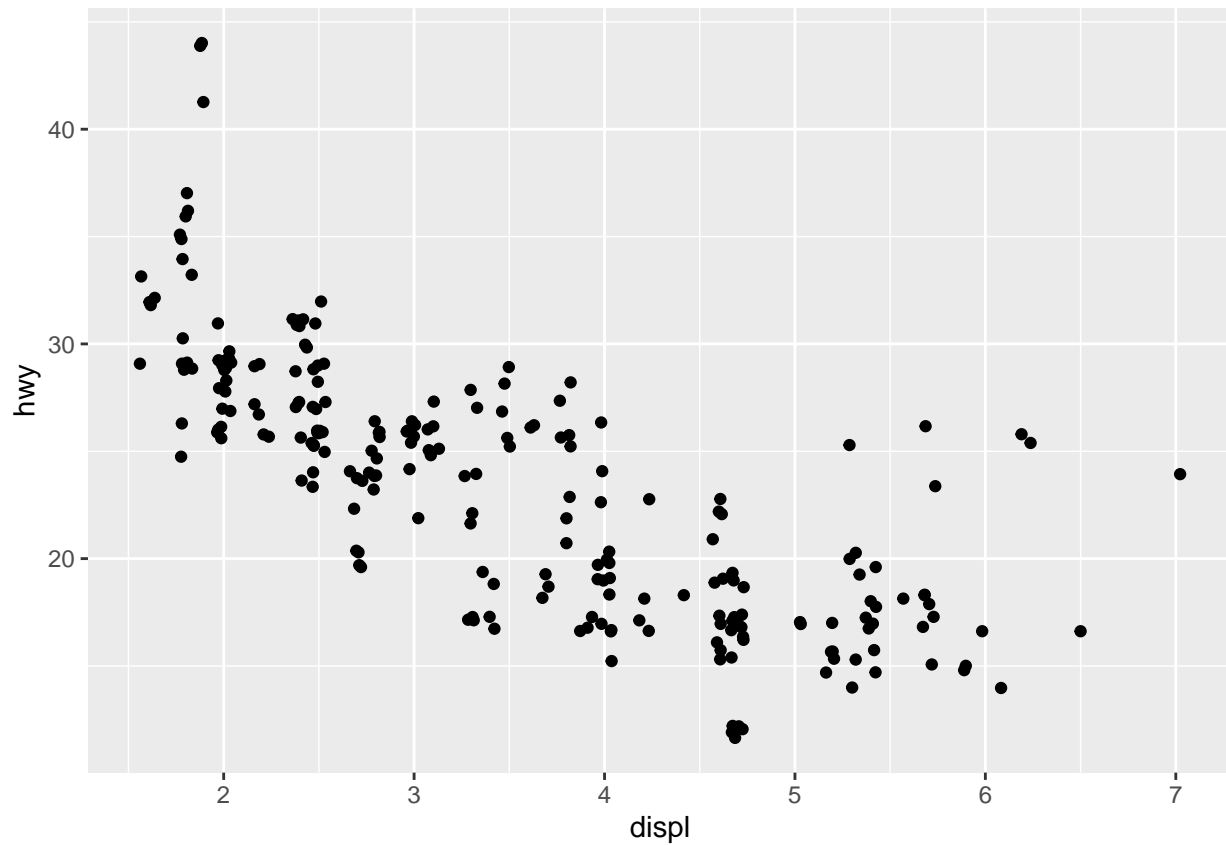


```
ggplot(
  data = diamonds
) +
  geom_bar(
    mapping = aes(
      x = cut, fill = clarity
    ), position = "dodge"
  )
```



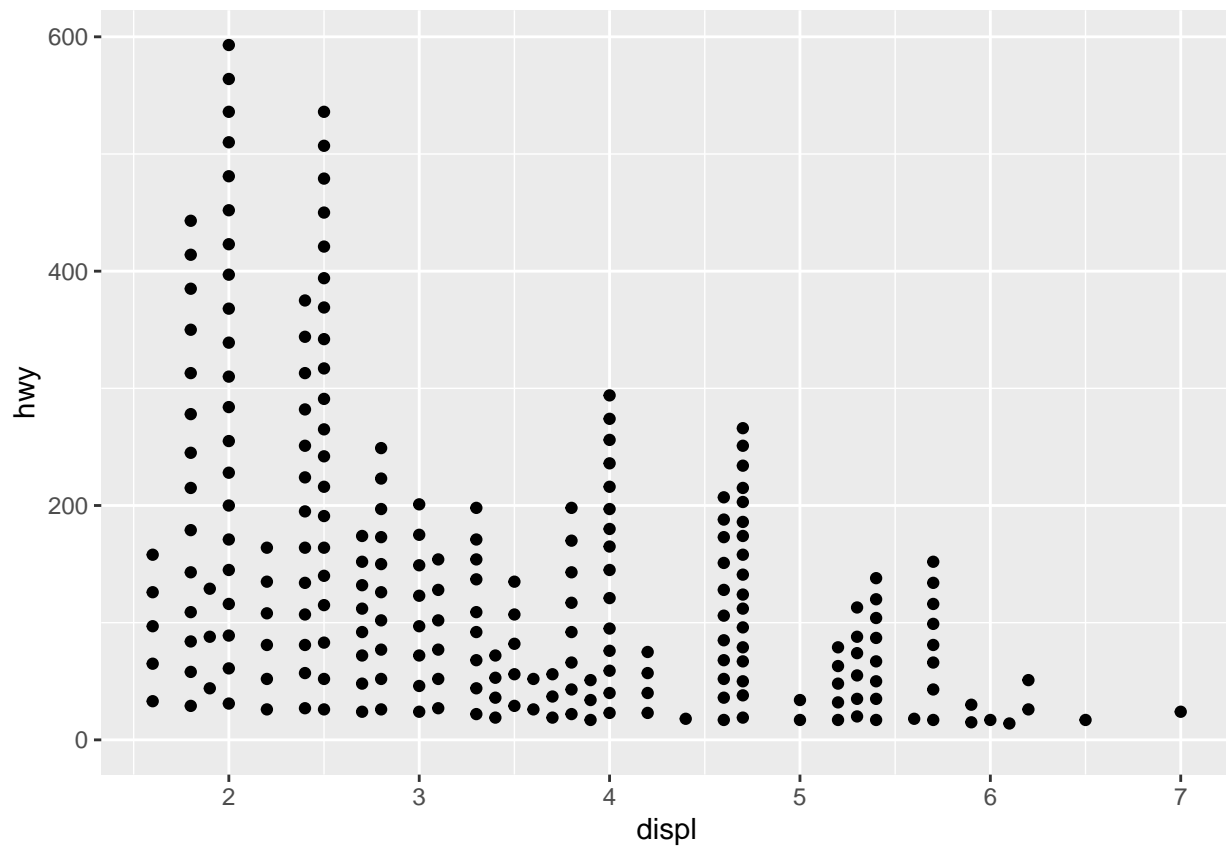
dodge coloca objetos sobrepostos diretamente um ao lado do outro, facilita a comparação de valores individuais

```
ggplot(
  data = mpg
) +
  geom_point(
    mapping = aes(
      x = displ, y = hwy
    ),
    position = "jitter"
  )
```

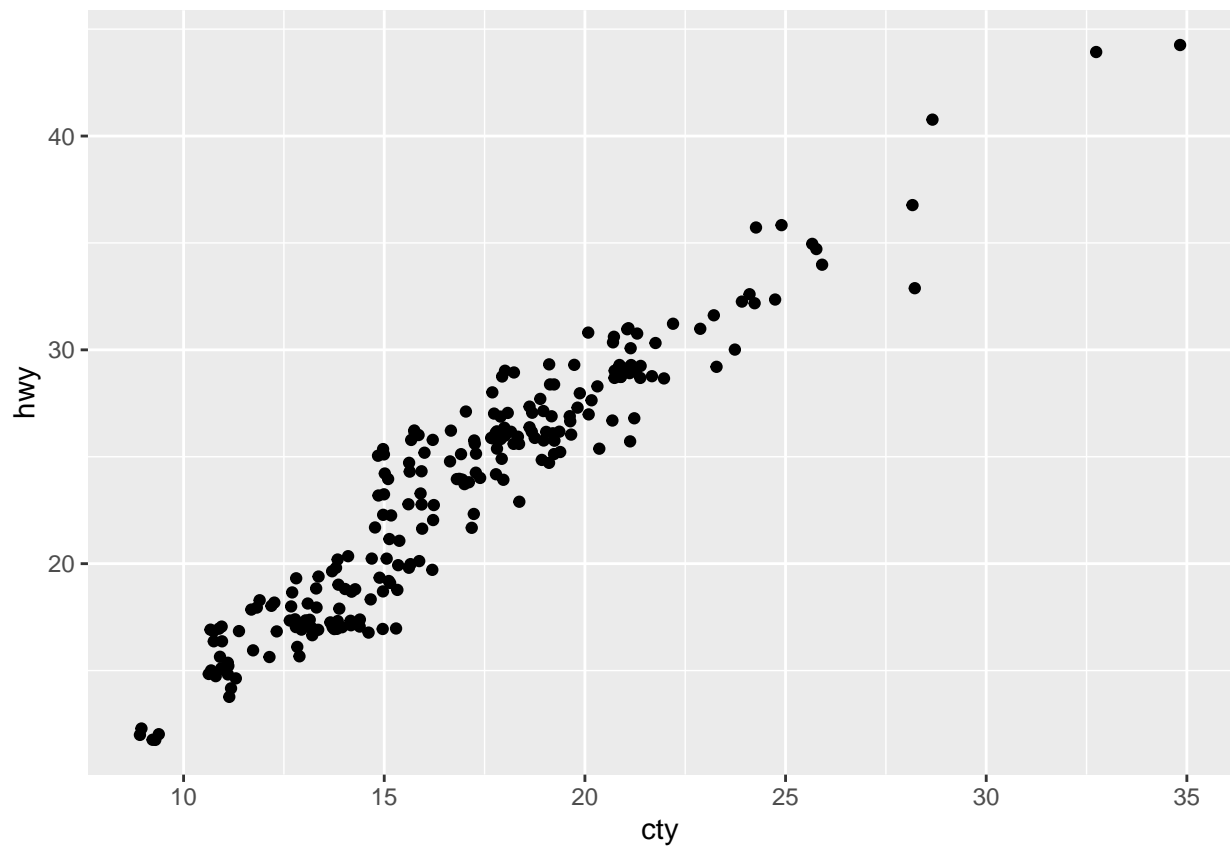
para evitar sobreposição de pontos no gráficos, podemos utilizar o `position = jitter` pois ele adiciona uma pequena quantidade de ruídos aleatórios a cada ponto, isso espalha os pontos, porque não é provável que dois pontos quaisquer receba a mesma quantidade de ruídos aleatório,

```
ggplot(  
  data = mpg  
) + geom_point(  
  mapping = aes(  
    x = displ, y = hwy  
  ),  
  position = "jitter"  
)
```



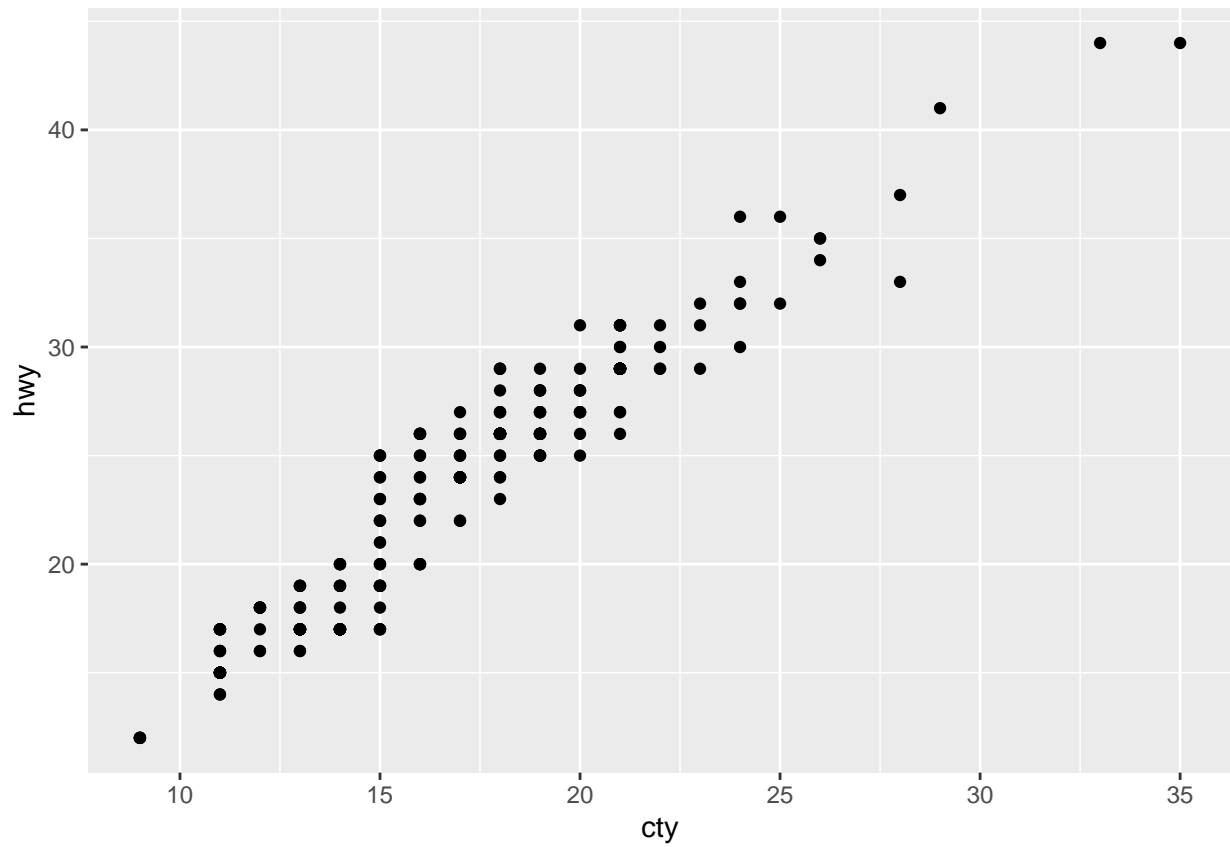
exer 1 pg 31 descreve a sobreposição dos dados, é necessário adicionar o position jitter

```
ggplot(  
  data = mpg, mapping = aes(  
    x = displ, y = hwy)) +  
  geom_point(  
    position = "jitter")
```



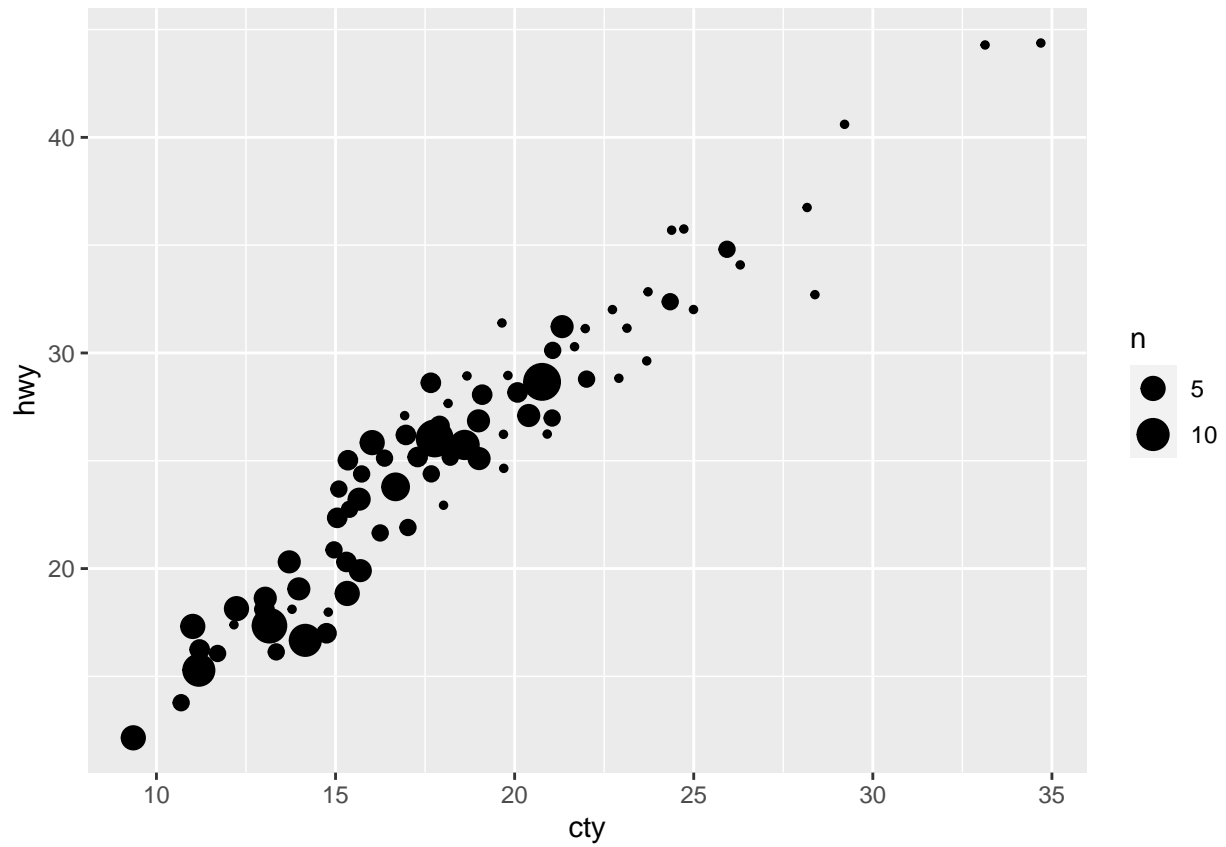
exer 2

```
ggplot(data = mpg, mapping = aes(x = cty, y = hwy)) +  
  geom_jitter(height = 0, width = 0)
```



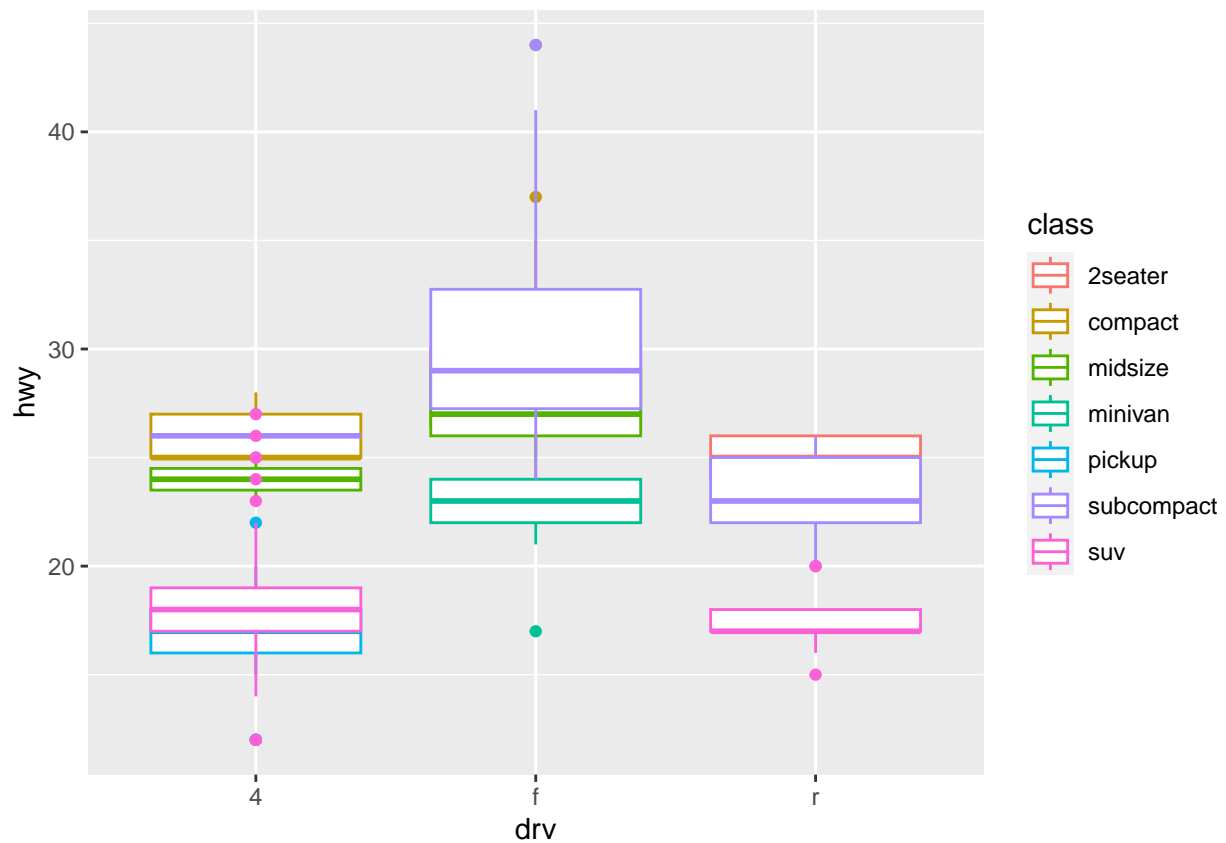
exer 3

```
ggplot(data = mpg, mapping = aes(x = cty, y = hwy)) +  
  geom_count(position = "jitter")
```



exer 4

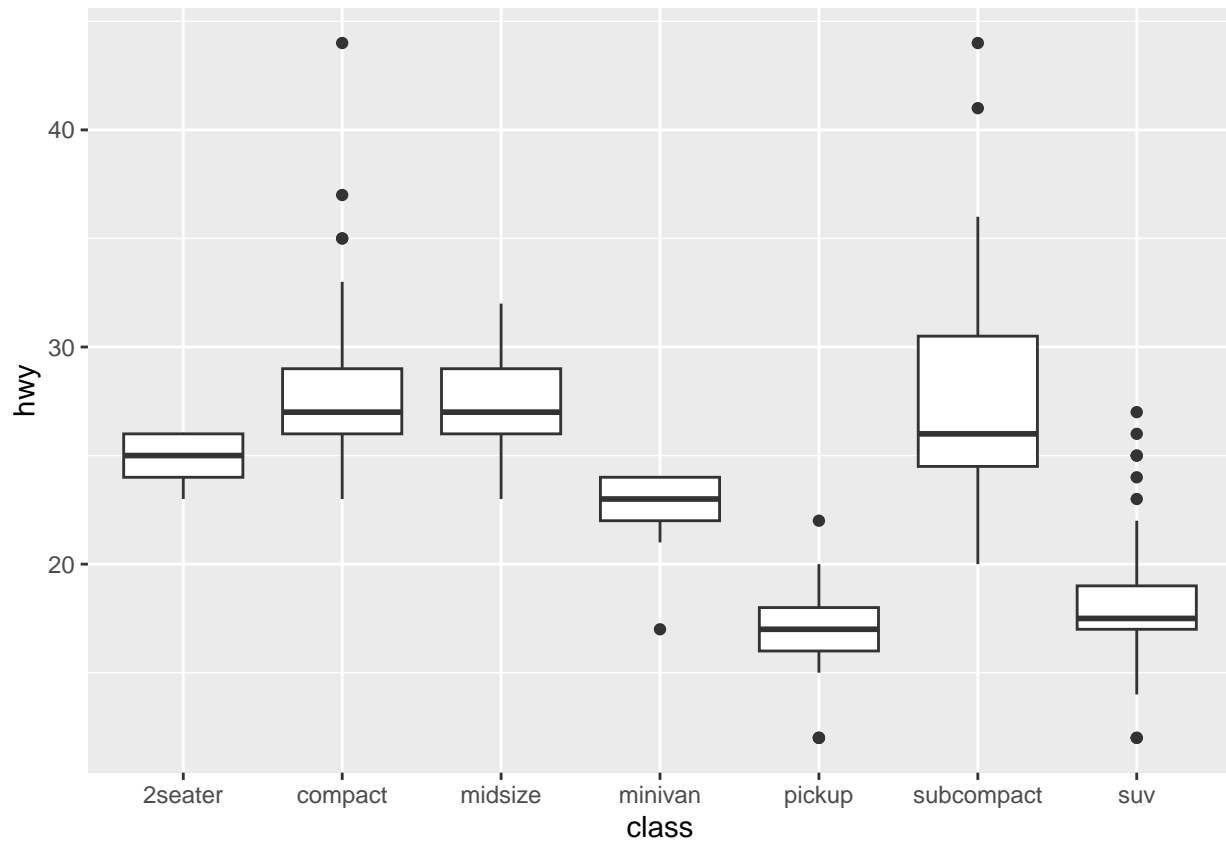
```
ggplot(data = mpg, aes(x = drv, y = hwy, colour = class)) +  
  geom_boxplot(position = "identity")
```



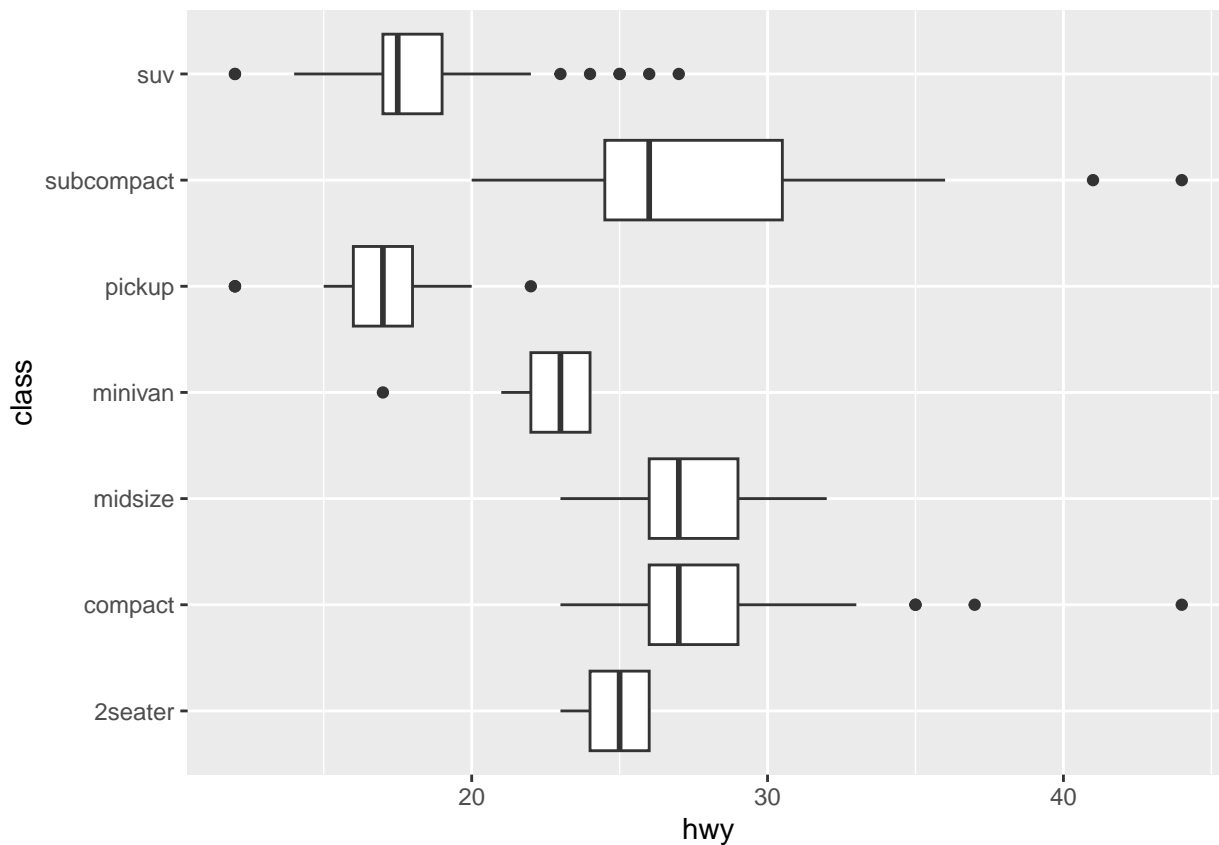
sistemas de coordenadas

coord_flip() troca os eixos x e y, é bom para rótulos longos

```
ggplot(
  data = mpg, mapping = aes(
    x = class, y = hwy
  )
) +
  geom_boxplot()
```



```
ggplot(  
  data = mpg, mapping = aes(  
    x = class, y = hwy  
  )  
) +  
  geom_boxplot() +  
  coord_flip()
```



```
nz <- map_data("nz")
nz
```

##	long	lat	group	order	region	subregion
## 1	172.7433	-34.44215	1	1	North.Island	<NA>
## 2	172.7983	-34.45562	1	2	North.Island	<NA>
## 3	172.8528	-34.44846	1	3	North.Island	<NA>
## 4	172.8986	-34.41786	1	4	North.Island	<NA>
## 5	172.9593	-34.42503	1	5	North.Island	<NA>
## 6	173.0184	-34.39895	1	6	North.Island	<NA>
## 7	173.0229	-34.44662	1	7	North.Island	<NA>
## 8	173.0184	-34.49343	1	8	North.Island	<NA>
## 9	172.9616	-34.50426	1	9	North.Island	<NA>
## 10	172.9181	-34.47367	1	10	North.Island	<NA>
## 11	172.9353	-34.52225	1	11	North.Island	<NA>
## 12	172.8808	-34.51504	1	12	North.Island	<NA>
## 13	172.9049	-34.55646	1	13	North.Island	<NA>
## 14	172.9553	-34.53303	1	14	North.Island	<NA>
## 15	172.9376	-34.57806	1	15	North.Island	<NA>
## 16	172.9760	-34.61227	1	16	North.Island	<NA>
## 17	172.9926	-34.56723	1	17	North.Island	<NA>
## 18	173.0218	-34.61404	1	18	North.Island	<NA>
## 19	173.0396	-34.65902	1	19	North.Island	<NA>
## 20	173.0676	-34.70044	1	20	North.Island	<NA>
## 21	173.1049	-34.73373	1	21	North.Island	<NA>
## 22	173.1490	-34.76616	1	22	North.Island	<NA>
## 23	173.1839	-34.80575	1	23	North.Island	<NA>

## 24	173.1358	-34.78232	1	24	North.Island	<NA>
## 25	173.1404	-34.82913	1	25	North.Island	<NA>
## 26	173.1822	-34.85973	1	26	North.Island	<NA>
## 27	173.2326	-34.88316	1	27	North.Island	<NA>
## 28	173.2917	-34.89393	1	28	North.Island	<NA>
## 29	173.2687	-34.93536	1	29	North.Island	<NA>
## 30	173.2338	-34.97673	1	30	North.Island	<NA>
## 31	173.2453	-35.02176	1	31	North.Island	<NA>
## 32	173.3020	-35.02176	1	32	North.Island	<NA>
## 33	173.3415	-34.98033	1	33	North.Island	<NA>
## 34	173.3369	-34.93175	1	34	North.Island	<NA>
## 35	173.3117	-34.88677	1	35	North.Island	<NA>
## 36	173.3598	-34.85795	1	36	North.Island	<NA>
## 37	173.4034	-34.82827	1	37	North.Island	<NA>
## 38	173.4584	-34.83727	1	38	North.Island	<NA>
## 39	173.4303	-34.88047	1	39	North.Island	<NA>
## 40	173.3942	-34.91914	1	40	North.Island	<NA>
## 41	173.4183	-34.96687	1	41	North.Island	<NA>
## 42	173.4693	-34.99385	1	42	North.Island	<NA>
## 43	173.5237	-34.99025	1	43	North.Island	<NA>
## 44	173.5592	-35.02806	1	44	North.Island	<NA>
## 45	173.5615	-34.97942	1	45	North.Island	<NA>
## 46	173.5695	-34.92905	1	46	North.Island	<NA>
## 47	173.6223	-34.94527	1	47	North.Island	<NA>
## 48	173.6732	-34.96503	1	48	North.Island	<NA>
## 49	173.7260	-34.98572	1	49	North.Island	<NA>
## 50	173.7747	-35.00915	1	50	North.Island	<NA>
## 51	173.7420	-35.05052	1	51	North.Island	<NA>
## 52	173.6985	-35.07842	1	52	North.Island	<NA>
## 53	173.7580	-35.08473	1	53	North.Island	<NA>
## 54	173.7901	-35.04514	1	54	North.Island	<NA>
## 55	173.8360	-35.01276	1	55	North.Island	<NA>
## 56	173.8916	-35.02714	1	56	North.Island	<NA>
## 57	173.9443	-35.06313	1	57	North.Island	<NA>
## 58	173.9471	-35.10994	1	58	North.Island	<NA>
## 59	173.9895	-35.14053	1	59	North.Island	<NA>
## 60	174.0445	-35.13423	1	60	North.Island	<NA>
## 61	174.1018	-35.14323	1	61	North.Island	<NA>
## 62	174.1351	-35.18282	1	62	North.Island	<NA>
## 63	174.0806	-35.20442	1	63	North.Island	<NA>
## 64	174.0686	-35.15944	1	64	North.Island	<NA>
## 65	174.0136	-35.15406	1	65	North.Island	<NA>
## 66	174.0388	-35.19542	1	66	North.Island	<NA>
## 67	173.9884	-35.21977	1	67	North.Island	<NA>
## 68	174.0434	-35.22602	1	68	North.Island	<NA>
## 69	174.0909	-35.25845	1	69	North.Island	<NA>
## 70	174.1093	-35.30887	1	70	North.Island	<NA>
## 71	174.1190	-35.35923	1	71	North.Island	<NA>
## 72	174.1832	-35.35923	1	72	North.Island	<NA>
## 73	174.2405	-35.35207	1	73	North.Island	<NA>
## 74	174.1998	-35.31786	1	74	North.Island	<NA>
## 75	174.1448	-35.31964	1	75	North.Island	<NA>
## 76	174.1225	-35.27466	1	76	North.Island	<NA>
## 77	174.1774	-35.29082	1	77	North.Island	<NA>

## 78	174.2325	-35.26383	1	78	North.Island	<NA>
## 79	174.2817	-35.24407	1	79	North.Island	<NA>
## 80	174.3098	-35.20173	1	80	North.Island	<NA>
## 81	174.3035	-35.24854	1	81	North.Island	<NA>
## 82	174.3121	-35.29443	1	82	North.Island	<NA>
## 83	174.3459	-35.33677	1	83	North.Island	<NA>
## 84	174.3906	-35.37092	1	84	North.Island	<NA>
## 85	174.3396	-35.35293	1	85	North.Island	<NA>
## 86	174.3539	-35.40157	1	86	North.Island	<NA>
## 87	174.3786	-35.44477	1	87	North.Island	<NA>
## 88	174.4364	-35.45016	1	88	North.Island	<NA>
## 89	174.4657	-35.48975	1	89	North.Island	<NA>
## 90	174.4422	-35.53112	1	90	North.Island	<NA>
## 91	174.4794	-35.56716	1	91	North.Island	<NA>
## 92	174.5327	-35.59414	1	92	North.Island	<NA>
## 93	174.5384	-35.64273	1	93	North.Island	<NA>
## 94	174.4788	-35.66072	1	94	North.Island	<NA>
## 95	174.5172	-35.69493	1	95	North.Island	<NA>
## 96	174.5138	-35.74174	1	96	North.Island	<NA>
## 97	174.5694	-35.75073	1	97	North.Island	<NA>
## 98	174.5613	-35.80116	1	98	North.Island	<NA>
## 99	174.5900	-35.85513	1	99	North.Island	<NA>
## 100	174.5373	-35.88034	1	100	North.Island	<NA>
## 101	174.5058	-35.84074	1	101	North.Island	<NA>
## 102	174.4857	-35.79577	1	102	North.Island	<NA>
## 103	174.4296	-35.80562	1	103	North.Island	<NA>
## 104	174.3757	-35.79124	1	104	North.Island	<NA>
## 105	174.3539	-35.74626	1	105	North.Island	<NA>
## 106	174.3316	-35.78946	1	106	North.Island	<NA>
## 107	174.3407	-35.83444	1	107	North.Island	<NA>
## 108	174.3986	-35.83805	1	108	North.Island	<NA>
## 109	174.4542	-35.84436	1	109	North.Island	<NA>
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## 111	174.4823	-35.89655	1	111	North.Island	<NA>
## 112	174.4765	-35.94336	1	112	North.Island	<NA>
## 113	174.4886	-35.99556	1	113	North.Island	<NA>
## 114	174.5161	-36.04237	1	114	North.Island	<NA>
## 115	174.5665	-36.06936	1	115	North.Island	<NA>
## 116	174.6095	-36.10173	1	116	North.Island	<NA>
## 117	174.5883	-36.15215	1	117	North.Island	<NA>
## 118	174.6444	-36.16114	1	118	North.Island	<NA>
## 119	174.6719	-36.20257	1	119	North.Island	<NA>
## 120	174.7103	-36.23855	1	120	North.Island	<NA>
## 121	174.7493	-36.27275	1	121	North.Island	<NA>
## 122	174.7991	-36.29435	1	122	North.Island	<NA>
## 123	174.8100	-36.33933	1	123	North.Island	<NA>
## 124	174.7728	-36.37715	1	124	North.Island	<NA>
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## 129	174.7390	-36.46624	1	129	North.Island	<NA>
## 130	174.6914	-36.43026	1	130	North.Island	<NA>
## 131	174.7137	-36.47524	1	131	North.Island	<NA>

## 132	174.7327	-36.52383	1	132	North.Island	<NA>
## 133	174.7200	-36.57247	1	133	North.Island	<NA>
## 134	174.7120	-36.61922	1	134	North.Island	<NA>
## 135	174.7624	-36.64804	1	135	North.Island	<NA>
## 136	174.8220	-36.61922	1	136	North.Island	<NA>
## 137	174.7802	-36.65704	1	137	North.Island	<NA>
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## 148	174.6467	-36.87127	1	148	North.Island	<NA>
## 149	174.6839	-36.91624	1	149	North.Island	<NA>
## 150	174.7189	-36.88026	1	150	North.Island	<NA>
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## 152	174.8295	-36.87304	1	152	North.Island	<NA>
## 153	174.8879	-36.87304	1	153	North.Island	<NA>
## 154	174.8845	-36.91985	1	154	North.Island	<NA>
## 155	174.8696	-36.96483	1	155	North.Island	<NA>
## 156	174.9022	-36.91802	1	156	North.Island	<NA>
## 157	174.9171	-36.87396	1	157	North.Island	<NA>
## 158	174.9521	-36.91355	1	158	North.Island	<NA>
## 159	174.9802	-36.95853	1	159	North.Island	<NA>
## 160	175.0036	-36.90816	1	160	North.Island	<NA>
## 161	175.0621	-36.91355	1	161	North.Island	<NA>
## 162	175.0862	-36.96575	1	162	North.Island	<NA>
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## 165	175.2672	-36.99903	1	165	North.Island	<NA>
## 166	175.3067	-37.04407	1	166	North.Island	<NA>
## 167	175.3142	-37.09082	1	167	North.Island	<NA>
## 168	175.3113	-37.14663	1	168	North.Island	<NA>
## 169	175.3262	-37.19167	1	169	North.Island	<NA>
## 170	175.3595	-37.24386	1	170	North.Island	<NA>
## 171	175.4299	-37.25286	1	171	North.Island	<NA>
## 172	175.4924	-37.23486	1	172	North.Island	<NA>
## 173	175.5417	-37.21326	1	173	North.Island	<NA>
## 174	175.5703	-37.25647	1	174	North.Island	<NA>
## 175	175.5686	-37.20966	1	175	North.Island	<NA>
## 176	175.5422	-37.16462	1	176	North.Island	<NA>
## 177	175.5377	-37.10343	1	177	North.Island	<NA>
## 178	175.5256	-37.04946	1	178	North.Island	<NA>
## 179	175.5107	-37.00087	1	179	North.Island	<NA>
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## 183	175.5125	-36.83975	1	183	North.Island	<NA>
## 184	175.4763	-36.79833	1	184	North.Island	<NA>
## 185	175.4523	-36.75696	1	185	North.Island	<NA>

## 186	175.4643	-36.70832	1	186	North.Island	<NA>
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## 190	175.3406	-36.55986	1	190	North.Island	<NA>
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## 193	175.4523	-36.54456	1	193	North.Island	<NA>
## 194	175.5107	-36.55717	1	194	North.Island	<NA>
## 195	175.5503	-36.59315	1	195	North.Island	<NA>
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## 197	175.5972	-36.66512	1	197	North.Island	<NA>
## 198	175.5921	-36.71015	1	198	North.Island	<NA>
## 199	175.6270	-36.74974	1	199	North.Island	<NA>
## 200	175.6265	-36.79472	1	200	North.Island	<NA>
## 201	175.6872	-36.79116	1	201	North.Island	<NA>
## 202	175.7359	-36.76682	1	202	North.Island	<NA>
## 203	175.7886	-36.74705	1	203	North.Island	<NA>
## 204	175.8413	-36.77587	1	204	North.Island	<NA>
## 205	175.7932	-36.79747	1	205	North.Island	<NA>
## 206	175.7617	-36.83523	1	206	North.Island	<NA>
## 207	175.7181	-36.86852	1	207	North.Island	<NA>
## 208	175.6924	-36.91355	1	208	North.Island	<NA>
## 209	175.7319	-36.88112	1	209	North.Island	<NA>
## 210	175.7846	-36.90364	1	210	North.Island	<NA>
## 211	175.8407	-36.90725	1	211	North.Island	<NA>
## 212	175.8516	-36.95406	1	212	North.Island	<NA>
## 213	175.8579	-37.00442	1	213	North.Island	<NA>
## 214	175.8803	-37.05307	1	214	North.Island	<NA>
## 215	175.8430	-37.08727	1	215	North.Island	<NA>
## 216	175.8958	-37.11065	1	216	North.Island	<NA>
## 217	175.8986	-37.15923	1	217	North.Island	<NA>
## 218	175.8963	-37.20966	1	218	North.Island	<NA>
## 219	175.8728	-37.25194	1	219	North.Island	<NA>
## 220	175.9021	-37.30144	1	220	North.Island	<NA>
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## 224	175.9737	-37.48502	1	224	North.Island	<NA>
## 225	175.9530	-37.52736	1	225	North.Island	<NA>
## 226	175.9794	-37.57056	1	226	North.Island	<NA>
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## 232	176.1169	-37.73706	1	232	North.Island	<NA>
## 233	176.1736	-37.72985	1	233	North.Island	<NA>
## 234	176.1822	-37.77482	1	234	North.Island	<NA>
## 235	176.2458	-37.77127	1	235	North.Island	<NA>
## 236	176.2011	-37.73706	1	236	North.Island	<NA>
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## 1354	172.5554	-40.58913	2	1354	South.Island	<NA>
## 1355	172.5863	-40.54777	2	1355	South.Island	<NA>
## 1356	172.6362	-40.52256	2	1356	South.Island	<NA>
## 1357	172.6391	-40.51356	2	1357	South.Island	<NA>
## 1359	167.8732	-46.80366	3	1359	Stewart.Island	<NA>
## 1360	167.8067	-46.81627	3	1360	Stewart.Island	<NA>
## 1361	167.7305	-46.81443	3	1361	Stewart.Island	<NA>
## 1362	167.6916	-46.85947	3	1362	Stewart.Island	<NA>
## 1363	167.6921	-46.90622	3	1363	Stewart.Island	<NA>
## 1364	167.7139	-46.95664	3	1364	Stewart.Island	<NA>
## 1365	167.7357	-46.99984	3	1365	Stewart.Island	<NA>
## 1366	167.7363	-47.04843	3	1366	Stewart.Island	<NA>
## 1367	167.6904	-47.08447	3	1367	Stewart.Island	<NA>
## 1368	167.6698	-47.13122	3	1368	Stewart.Island	<NA>
## 1369	167.6114	-47.16182	3	1369	Stewart.Island	<NA>
## 1370	167.5598	-47.20147	3	1370	Stewart.Island	<NA>
## 1371	167.5535	-47.24822	3	1371	Stewart.Island	<NA>
## 1372	167.5460	-47.29417	3	1372	Stewart.Island	<NA>
## 1373	167.4922	-47.32655	3	1373	Stewart.Island	<NA>
## 1374	167.4360	-47.35536	3	1374	Stewart.Island	<NA>
## 1375	167.4183	-47.40034	3	1375	Stewart.Island	<NA>

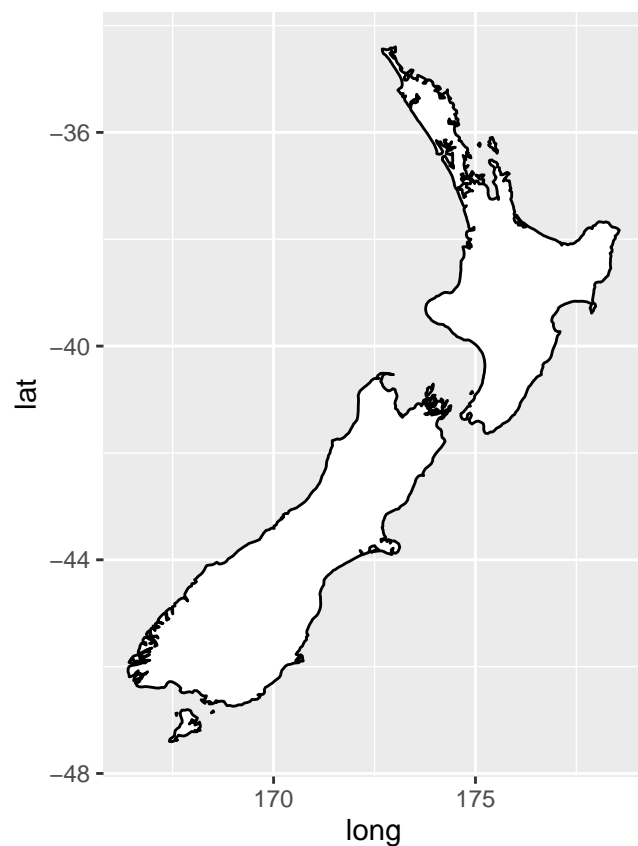
## 1376	167.4865	-47.40573	3	1376	Stewart.Island	<NA>
## 1377	167.5552	-47.38412	3	1377	Stewart.Island	<NA>
## 1378	167.6228	-47.37605	3	1378	Stewart.Island	<NA>
## 1379	167.5604	-47.36075	3	1379	Stewart.Island	<NA>
## 1380	167.6068	-47.32202	3	1380	Stewart.Island	<NA>
## 1381	167.6457	-47.28242	3	1381	Stewart.Island	<NA>
## 1382	167.7133	-47.29503	3	1382	Stewart.Island	<NA>
## 1383	167.7832	-47.29864	3	1383	Stewart.Island	<NA>
## 1384	167.8514	-47.27882	3	1384	Stewart.Island	<NA>
## 1385	167.9127	-47.24644	3	1385	Stewart.Island	<NA>
## 1386	167.9660	-47.21585	3	1386	Stewart.Island	<NA>
## 1387	168.0319	-47.21946	3	1387	Stewart.Island	<NA>
## 1388	168.1012	-47.21946	3	1388	Stewart.Island	<NA>
## 1389	168.0480	-47.19247	3	1389	Stewart.Island	<NA>
## 1390	168.1156	-47.20502	3	1390	Stewart.Island	<NA>
## 1391	168.1855	-47.19247	3	1391	Stewart.Island	<NA>
## 1392	168.1356	-47.16365	3	1392	Stewart.Island	<NA>
## 1393	168.1883	-47.13122	3	1393	Stewart.Island	<NA>
## 1394	168.1820	-47.08625	3	1394	Stewart.Island	<NA>
## 1395	168.1654	-47.03766	3	1395	Stewart.Island	<NA>
## 1396	168.1167	-47.07725	3	1396	Stewart.Island	<NA>
## 1397	168.0491	-47.09346	3	1397	Stewart.Island	<NA>
## 1398	168.1024	-47.05926	3	1398	Stewart.Island	<NA>
## 1399	168.0319	-47.05026	3	1399	Stewart.Island	<NA>
## 1400	167.9672	-47.03943	3	1400	Stewart.Island	<NA>
## 1401	167.9133	-47.07542	3	1401	Stewart.Island	<NA>
## 1402	167.9568	-47.03405	3	1402	Stewart.Island	<NA>
## 1403	167.9769	-46.98907	3	1403	Stewart.Island	<NA>
## 1404	168.0216	-47.02144	3	1404	Stewart.Island	<NA>
## 1405	168.0915	-47.00706	3	1405	Stewart.Island	<NA>
## 1406	168.1144	-46.96203	3	1406	Stewart.Island	<NA>
## 1407	168.0588	-46.93327	3	1407	Stewart.Island	<NA>
## 1408	168.0033	-46.90622	3	1408	Stewart.Island	<NA>
## 1409	167.9672	-46.86847	3	1409	Stewart.Island	<NA>
## 1410	167.9477	-46.82526	3	1410	Stewart.Island	<NA>
## 1411	167.8887	-46.80727	3	1411	Stewart.Island	<NA>
## 1412	167.8732	-46.80366	3	1412	Stewart.Island	<NA>
## 1414	175.5359	-36.39153	4	1414	Great.Barrier.Island	<NA>
## 1415	175.5520	-36.34116	4	1415	Great.Barrier.Island	<NA>
## 1416	175.5038	-36.30335	4	1416	Great.Barrier.Island	<NA>
## 1417	175.4947	-36.25654	4	1417	Great.Barrier.Island	<NA>
## 1418	175.5107	-36.21156	4	1418	Great.Barrier.Island	<NA>
## 1419	175.4609	-36.18996	4	1419	Great.Barrier.Island	<NA>
## 1420	175.4460	-36.13954	4	1420	Great.Barrier.Island	<NA>
## 1421	175.4202	-36.09273	4	1421	Great.Barrier.Island	<NA>
## 1422	175.3646	-36.10356	4	1422	Great.Barrier.Island	<NA>
## 1423	175.3663	-36.15037	4	1423	Great.Barrier.Island	<NA>
## 1424	175.3245	-36.18097	4	1424	Great.Barrier.Island	<NA>
## 1425	175.3749	-36.21156	4	1425	Great.Barrier.Island	<NA>
## 1426	175.3239	-36.23494	4	1426	Great.Barrier.Island	<NA>
## 1427	175.3640	-36.26915	4	1427	Great.Barrier.Island	<NA>
## 1428	175.4185	-36.28536	4	1428	Great.Barrier.Island	<NA>
## 1429	175.4511	-36.33217	4	1429	Great.Barrier.Island	<NA>
## 1430	175.5056	-36.35377	4	1430	Great.Barrier.Island	<NA>

## 1431	175.5359	-36.39153	4	1431	Great.Barrier.Island	<NA>
## 1433	166.4769	-45.88836	5	1433	Resolution.Island	<NA>
## 1434	166.5164	-45.84877	5	1434	Resolution.Island	<NA>
## 1435	166.5468	-45.88836	5	1435	Resolution.Island	<NA>
## 1436	166.5726	-45.93334	5	1436	Resolution.Island	<NA>
## 1437	166.6150	-45.89197	5	1437	Resolution.Island	<NA>
## 1438	166.6677	-45.91535	5	1438	Resolution.Island	<NA>
## 1439	166.6946	-45.87123	5	1439	Resolution.Island	<NA>
## 1440	166.6849	-45.82264	5	1440	Resolution.Island	<NA>
## 1441	166.6642	-45.77583	5	1441	Resolution.Island	<NA>
## 1442	166.5984	-45.78752	5	1442	Resolution.Island	<NA>
## 1443	166.5319	-45.80374	5	1443	Resolution.Island	<NA>
## 1444	166.4861	-45.84155	5	1444	Resolution.Island	<NA>
## 1445	166.4494	-45.88114	5	1445	Resolution.Island	<NA>
## 1446	166.4185	-45.92257	5	1446	Resolution.Island	<NA>
## 1447	166.4740	-45.89197	5	1447	Resolution.Island	<NA>
## 1448	166.4769	-45.88836	5	1448	Resolution.Island	<NA>
## 1450	175.0999	-36.19627	6	1450	Little.Barrier.Island	<NA>
## 1451	175.0638	-36.23225	6	1451	Little.Barrier.Island	<NA>
## 1452	175.1051	-36.26462	6	1452	Little.Barrier.Island	<NA>
## 1453	175.1228	-36.21787	6	1453	Little.Barrier.Island	<NA>
## 1454	175.0999	-36.19627	6	1454	Little.Barrier.Island	<NA>
## 1456	173.9064	-40.84925	7	1456	D'Urville.Island	<NA>
## 1457	173.9391	-40.80422	7	1457	D'Urville.Island	<NA>
## 1458	173.9529	-40.75747	7	1458	D'Urville.Island	<NA>
## 1459	173.9546	-40.70882	7	1459	D'Urville.Island	<NA>
## 1460	173.9242	-40.75025	7	1460	D'Urville.Island	<NA>
## 1461	173.9036	-40.79706	7	1461	D'Urville.Island	<NA>
## 1462	173.8577	-40.76646	7	1462	D'Urville.Island	<NA>
## 1463	173.8085	-40.79522	7	1463	D'Urville.Island	<NA>
## 1464	173.8113	-40.84387	7	1464	D'Urville.Island	<NA>
## 1465	173.7701	-40.88346	7	1465	D'Urville.Island	<NA>
## 1466	173.7752	-40.92844	7	1466	D'Urville.Island	<NA>
## 1467	173.8325	-40.91405	7	1467	D'Urville.Island	<NA>
## 1468	173.8738	-40.87624	7	1468	D'Urville.Island	<NA>
## 1469	173.9064	-40.84925	7	1469	D'Urville.Island	<NA>
## 1471	174.2599	-41.20925	8	1471	Arapawa.Island	<NA>
## 1472	174.1975	-41.22546	8	1472	Arapawa.Island	<NA>
## 1473	174.2531	-41.24884	8	1473	Arapawa.Island	<NA>
## 1474	174.3029	-41.21824	8	1474	Arapawa.Island	<NA>
## 1475	174.3671	-41.20925	8	1475	Arapawa.Island	<NA>
## 1476	174.3831	-41.15882	8	1476	Arapawa.Island	<NA>
## 1477	174.3929	-41.11385	8	1477	Arapawa.Island	<NA>
## 1478	174.3373	-41.13544	8	1478	Arapawa.Island	<NA>
## 1479	174.3407	-41.18764	8	1479	Arapawa.Island	<NA>
## 1480	174.2783	-41.19303	8	1480	Arapawa.Island	<NA>
## 1481	174.2599	-41.20925	8	1481	Arapawa.Island	<NA>
## 1483	175.0094	-36.79655	9	1483	Waiheke.Island	<NA>
## 1484	175.0552	-36.83076	9	1484	Waiheke.Island	<NA>
## 1485	175.0925	-36.86852	9	1485	Waiheke.Island	<NA>
## 1486	175.1492	-36.87757	9	1486	Waiheke.Island	<NA>
## 1487	175.1767	-36.83345	9	1487	Waiheke.Island	<NA>
## 1488	175.2139	-36.79747	9	1488	Waiheke.Island	<NA>
## 1489	175.1486	-36.79472	9	1489	Waiheke.Island	<NA>

## 1490	175.0999	-36.81632	9	1490	Waiheke.Island	<NA>
## 1491	175.0415	-36.80555	9	1491	Waiheke.Island	<NA>
## 1492	175.0094	-36.79655	9	1492	Waiheke.Island	<NA>
## 1494	176.1656	-37.69747	10	1494	Matakana.Island	<NA>
## 1495	176.1307	-37.65966	10	1495	Matakana.Island	<NA>
## 1496	176.0888	-37.62545	10	1496	Matakana.Island	<NA>
## 1497	176.0550	-37.58764	10	1497	Matakana.Island	<NA>
## 1498	176.0172	-37.54804	10	1498	Matakana.Island	<NA>
## 1499	176.0281	-37.59846	10	1499	Matakana.Island	<NA>
## 1500	176.0705	-37.63267	10	1500	Matakana.Island	<NA>
## 1501	176.0860	-37.67765	10	1501	Matakana.Island	<NA>
## 1502	176.1467	-37.69025	10	1502	Matakana.Island	<NA>
## 1503	176.1656	-37.69747	10	1503	Matakana.Island	<NA>
## 1505	166.9702	-45.45182	11	1505	Secretary.Island	<NA>
## 1506	166.9542	-45.40862	11	1506	Secretary.Island	<NA>
## 1507	166.9249	-45.36903	11	1507	Secretary.Island	<NA>
## 1508	166.9381	-45.32045	11	1508	Secretary.Island	<NA>
## 1509	166.8785	-45.35104	11	1509	Secretary.Island	<NA>
## 1510	166.8482	-45.39424	11	1510	Secretary.Island	<NA>
## 1511	166.8826	-45.43383	11	1511	Secretary.Island	<NA>
## 1512	166.9416	-45.45544	11	1512	Secretary.Island	<NA>
## 1513	166.9702	-45.45182	11	1513	Secretary.Island	<NA>
## 1515	166.7336	-45.91626	12	1515	Long.Island	<NA>
## 1516	166.6688	-45.92796	12	1516	Long.Island	<NA>
## 1517	166.6018	-45.94595	12	1517	Long.Island	<NA>
## 1518	166.6723	-45.94417	12	1518	Long.Island	<NA>
## 1519	166.7307	-45.91626	12	1519	Long.Island	<NA>
## 1520	166.7336	-45.91626	12	1520	Long.Island	<NA>
## 1522	174.8891	-36.47615	13	1522	Kawau.Island	<NA>
## 1523	174.8701	-36.42934	13	1523	Kawau.Island	<NA>
## 1524	174.8237	-36.45455	13	1524	Kawau.Island	<NA>
## 1525	174.8828	-36.47432	13	1525	Kawau.Island	<NA>
## 1526	174.8891	-36.47615	13	1526	Kawau.Island	<NA>
## 1528	174.8461	-36.82984	14	1528	Rangitoto.Island	<NA>
## 1529	174.9045	-36.82354	14	1529	Rangitoto.Island	<NA>
## 1530	174.8679	-36.78842	14	1530	Rangitoto.Island	<NA>
## 1531	174.8484	-36.83162	14	1531	Rangitoto.Island	<NA>
## 1532	174.8461	-36.82984	14	1532	Rangitoto.Island	<NA>
## 1534	175.2025	-36.93332	15	1534	Ponui.Island	<NA>
## 1535	175.2076	-36.88387	15	1535	Ponui.Island	<NA>
## 1536	175.1887	-36.92616	15	1536	Ponui.Island	<NA>
## 1537	175.2025	-36.93332	15	1537	Ponui.Island	<NA>
## 1539	174.9166	-36.79999	16	1539	Motutapu.Island	<NA>
## 1540	174.9544	-36.76664	16	1540	Motutapu.Island	<NA>
## 1541	174.9166	-36.73055	16	1541	Motutapu.Island	<NA>
## 1542	174.8919	-36.77082	16	1542	Motutapu.Island	<NA>
## 1543	174.9166	-36.79999	16	1543	Motutapu.Island	<NA>
## 1545	174.9154	-40.84742	17	1545	Kapiti.Island	<NA>
## 1546	174.8765	-40.89246	17	1546	Kapiti.Island	<NA>
## 1547	174.9355	-40.87263	17	1547	Kapiti.Island	<NA>
## 1548	174.9154	-40.84742	17	1548	Kapiti.Island	<NA>
## 1550	173.1163	-41.25697	18	1550	Rabbit.Island	<NA>
## 1551	173.1713	-41.28573	18	1551	Rabbit.Island	<NA>
## 1552	173.1186	-41.25875	18	1552	Rabbit.Island	<NA>

```
## 1553 173.1163 -41.25697 18 1553 Rabbit.Island <NA>
## 1555 167.5798 -46.87385 19 1555 Codfish.Island <NA>
## 1556 167.5965 -46.91705 19 1556 Codfish.Island <NA>
## 1557 167.6171 -46.87024 19 1557 Codfish.Island <NA>
## 1558 167.5798 -46.87385 19 1558 Codfish.Island <NA>
## 1560 168.5052 -46.82704 20 1560 Ruapuke.Island <NA>
## 1561 168.4576 -46.86485 20 1561 Ruapuke.Island <NA>
## 1562 168.5195 -46.84686 20 1562 Ruapuke.Island <NA>
## 1563 168.5052 -46.82704 20 1563 Ruapuke.Island <NA>
## 1565 166.5800 -46.31315 21 1565 Coal.Island <NA>
## 1566 166.6282 -46.27895 21 1566 Coal.Island <NA>
## 1567 166.5754 -46.30954 21 1567 Coal.Island <NA>
## 1568 166.5800 -46.31315 21 1568 Coal.Island <NA>
## 1570 166.4580 -45.93695 22 1570 Anchor.Island <NA>
## 1571 166.5279 -45.93872 22 1571 Anchor.Island <NA>
## 1572 166.4608 -45.93512 22 1572 Anchor.Island <NA>
## 1573 166.4580 -45.93695 22 1573 Anchor.Island <NA>
```

```
ggplot(nz, aes(
  long, lat, group = group
)) +
  geom_polygon(fill = "white", color = "black") +
  coord_quickmap()
```



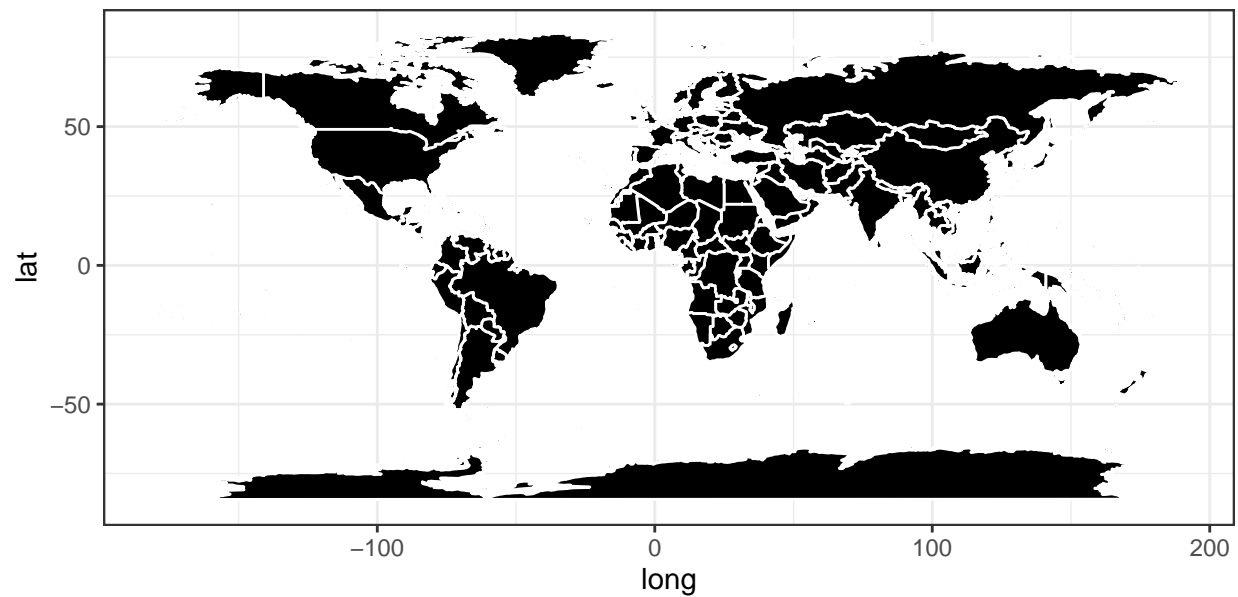
coord_quickmap configura a proporção de tela corretamente

```
world <- map_data("world")
ggplot(world, aes(
```

```

    long, lat, group = group
  )) +
  geom_polygon(fill = "black", color = "white") +
  coord_quickmap() + theme_bw()

```

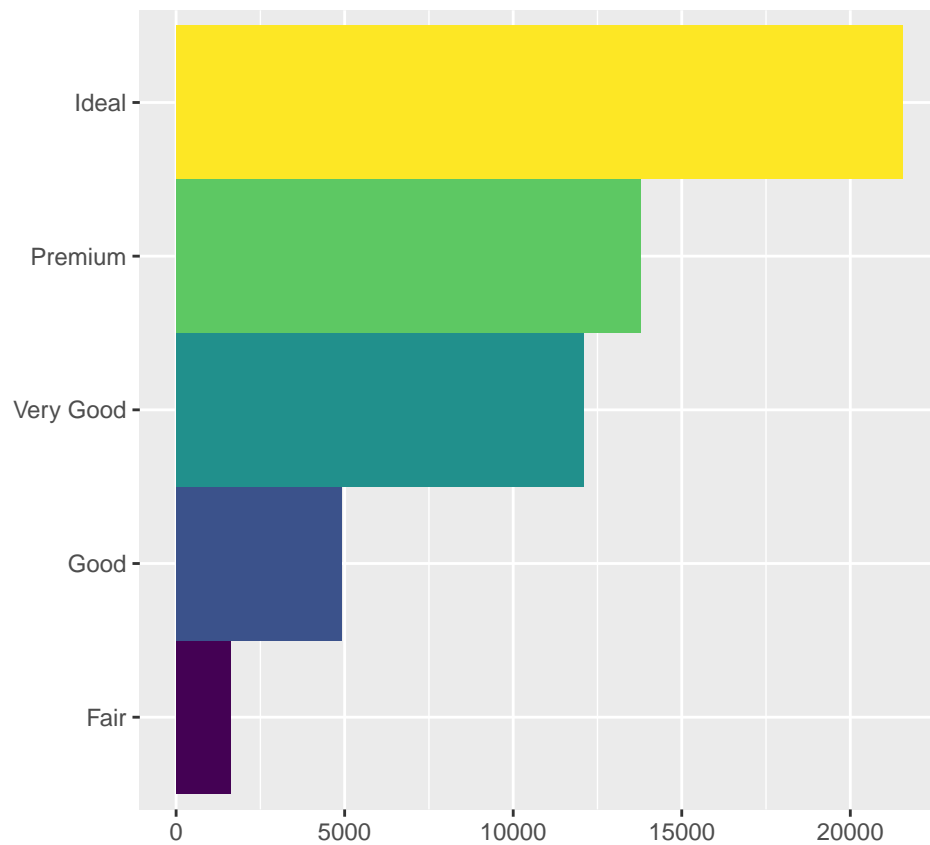


```

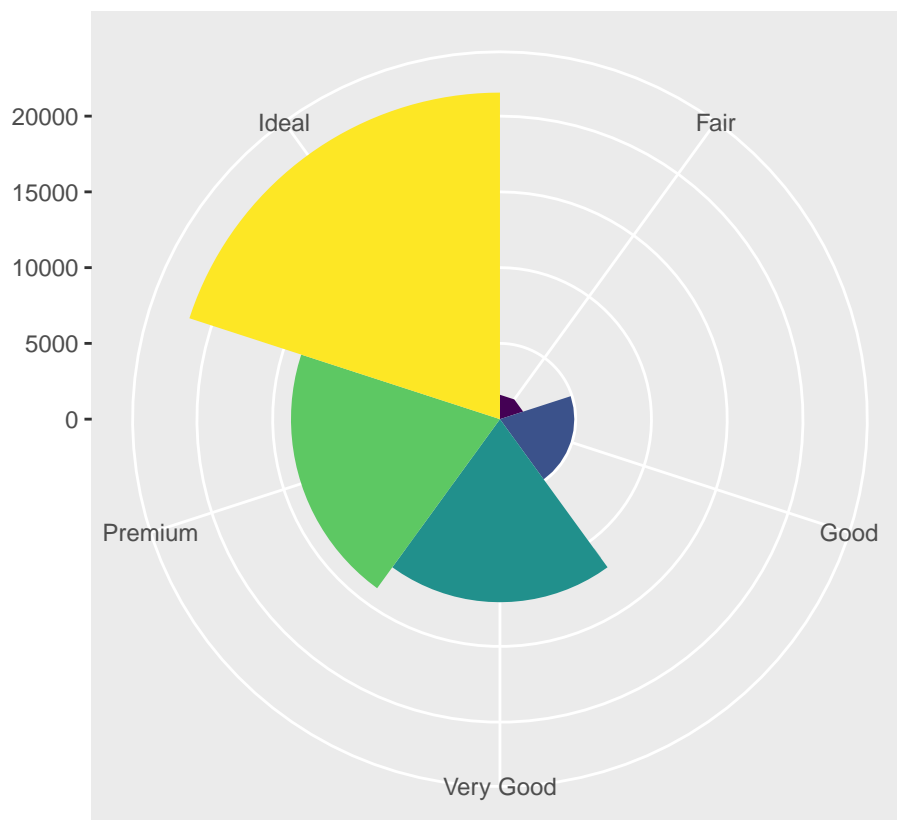
bar <- ggplot(data = diamonds) +
  geom_bar(
    mapping = aes(
      x = cut, fill = cut
    ), show.legend = FALSE,
    width = 1
  ) +
  theme(aspect.ratio = 1) +
  labs(x = NULL, y = NULL)

bar + coord_flip()

```

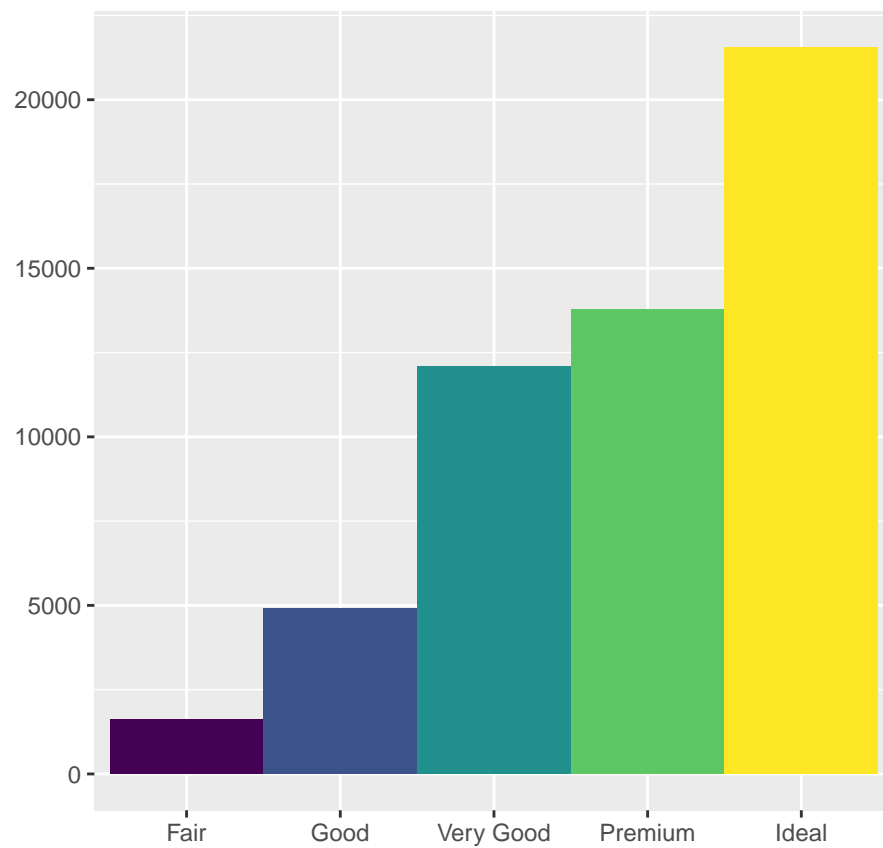


`bar + coord_polar()`



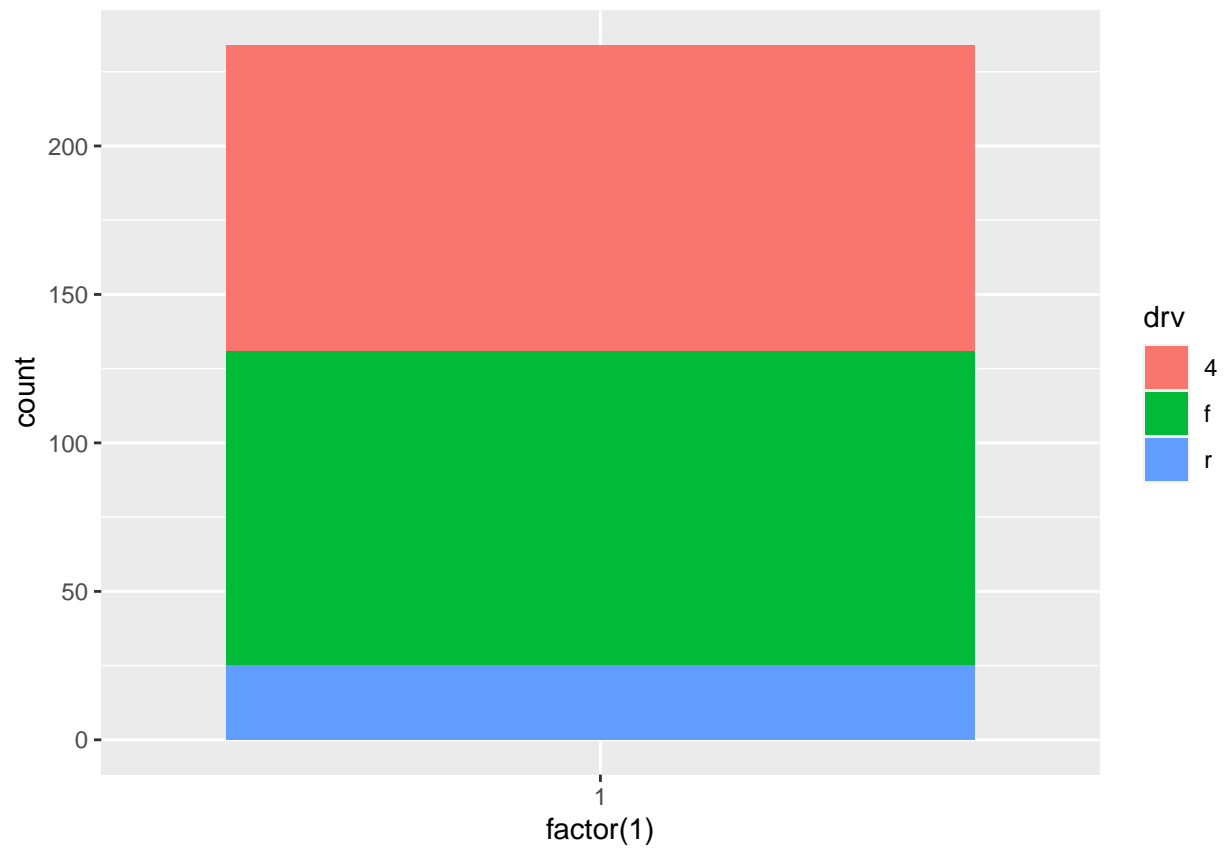
`coord_polar` usa coordenadas polares, que revelam uma conexão interessante entre um gráfico de barras e gráfico de setores.

`bar`

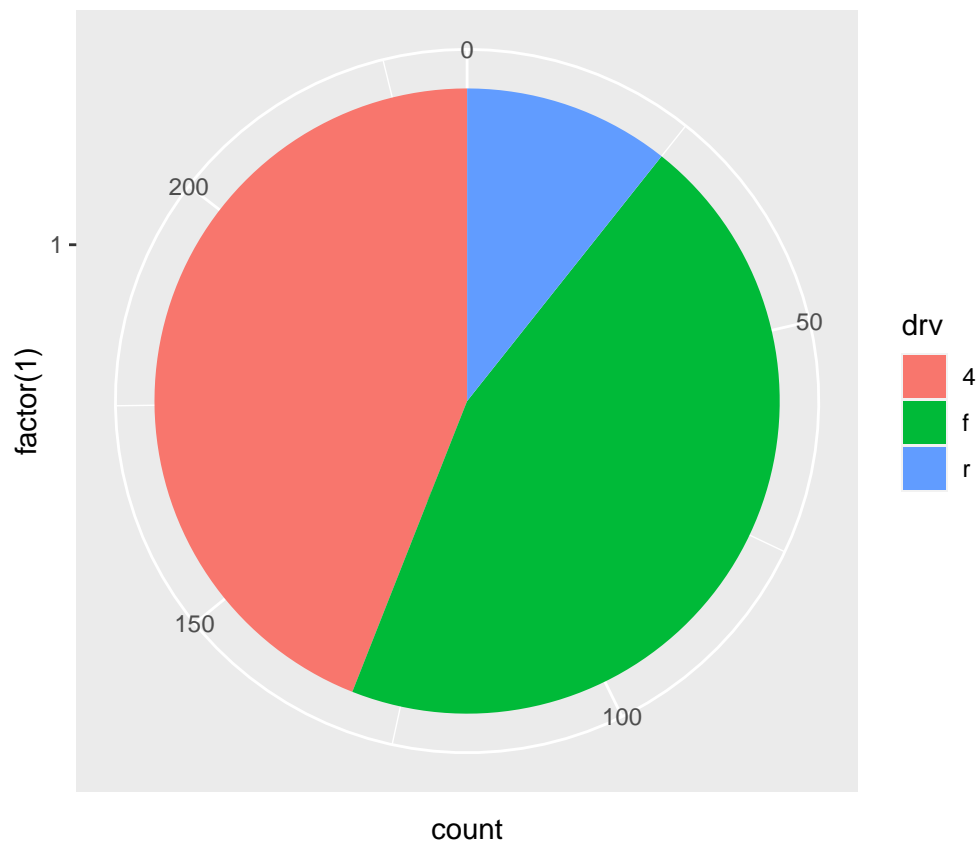


exer 1 pg 33

```
ggplot(  
  mpg, aes(  
    x = factor(1), fill = drv  
  )  
) +  
  geom_bar()
```

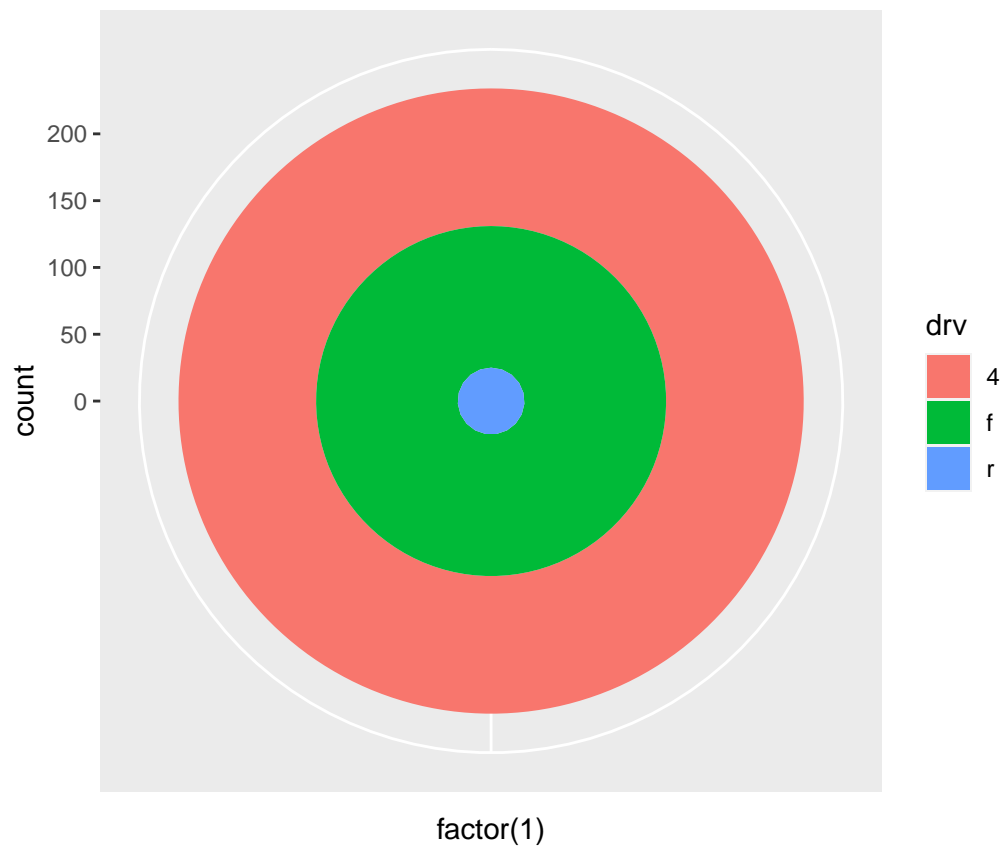



```
ggplot(  
  mpg, aes(  
    x = factor(1), fill = drv  
  )  
) +  
  geom_bar(width = 1) +  
  coord_polar(theta = "y")
```



o argumento `theta=y` é o angulo de inicio da secção
se deixar em branco

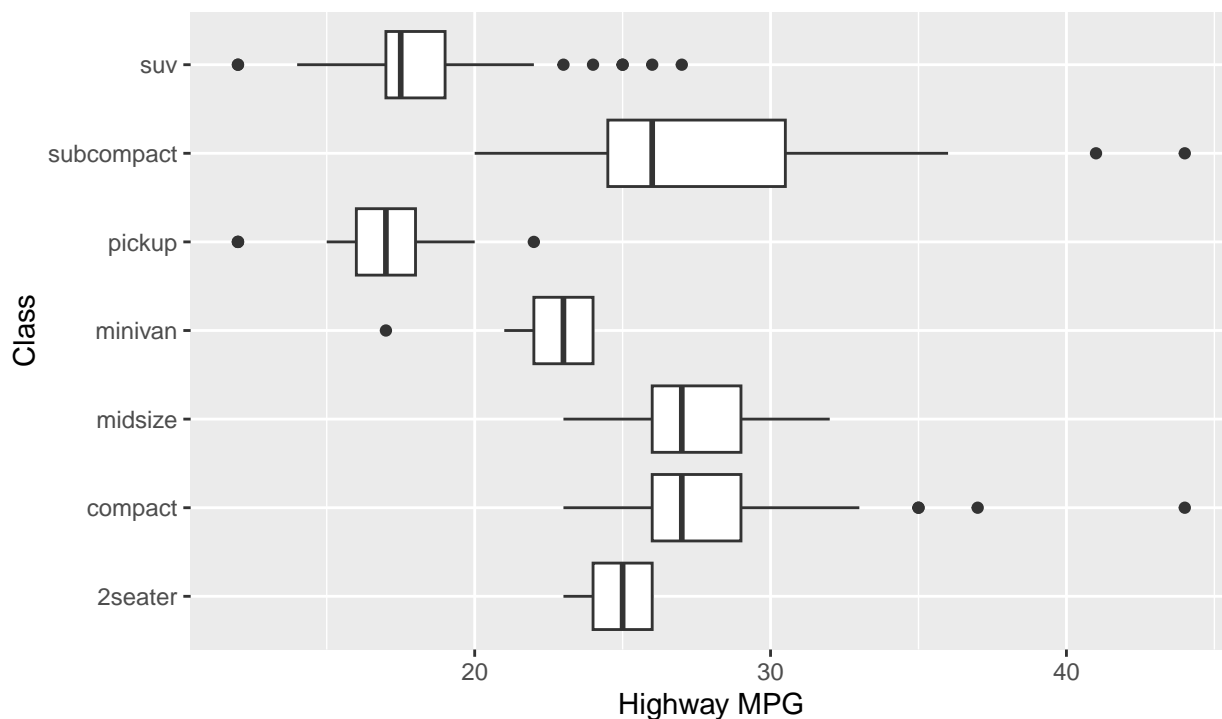
```
ggplot(
  mpg, aes(
    x = factor(1), fill = drv
  )
) +
  geom_bar(width = 1) +
  coord_polar()
```



exer2 labs adicionda titulos, titulos plots, capitulos

```
ggplot(
  data = mpg,
  mapping = aes(
    x = class, y = hwy
  )
) +
  geom_boxplot() +
  coord_flip() +
  labs(y = "Highway MPG",
       x = "Class",
       title = "Higway MPG by car class",
       subtitle = "1999-2008",
       caption = "Source: http://fueleconomy.gov")
```

Higway MPG by car class
1999–2008



Source: <http://fueleconomy.gov>

exer 3 coord_quickmap X coord_map — se pegarmos o mapa da NZ.

```
nz <- map_data("nz")
nz
```

##	long	lat	group	order	region	subregion
## 1	172.7433	-34.44215	1	1	North.Island	<NA>
## 2	172.7983	-34.45562	1	2	North.Island	<NA>
## 3	172.8528	-34.44846	1	3	North.Island	<NA>
## 4	172.8986	-34.41786	1	4	North.Island	<NA>
## 5	172.9593	-34.42503	1	5	North.Island	<NA>
## 6	173.0184	-34.39895	1	6	North.Island	<NA>
## 7	173.0229	-34.44662	1	7	North.Island	<NA>
## 8	173.0184	-34.49343	1	8	North.Island	<NA>
## 9	172.9616	-34.50426	1	9	North.Island	<NA>
## 10	172.9181	-34.47367	1	10	North.Island	<NA>
## 11	172.9353	-34.52225	1	11	North.Island	<NA>
## 12	172.8808	-34.51504	1	12	North.Island	<NA>
## 13	172.9049	-34.55646	1	13	North.Island	<NA>
## 14	172.9553	-34.53303	1	14	North.Island	<NA>
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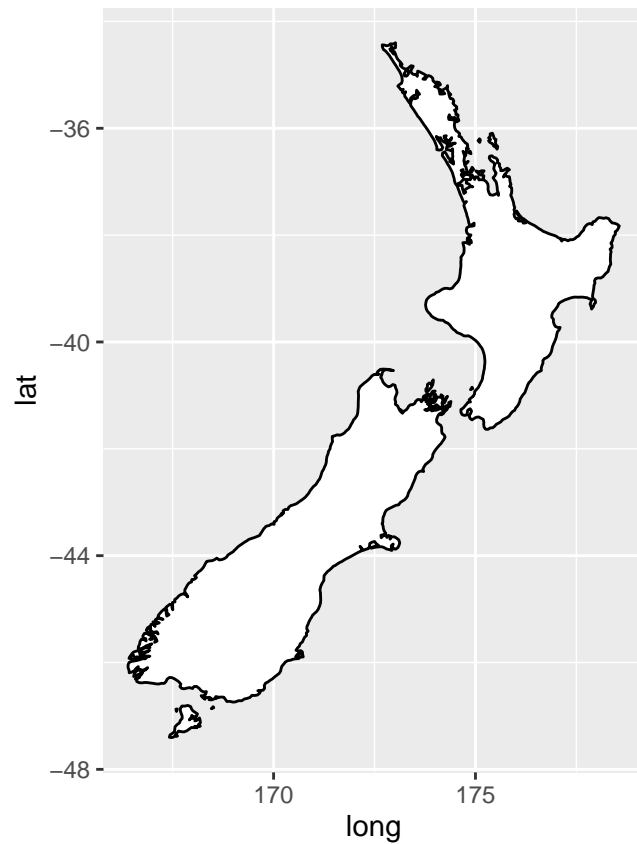
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## 1415	175.5520	-36.34116	4	1415	Great.Barrier.Island	<NA>
## 1416	175.5038	-36.30335	4	1416	Great.Barrier.Island	<NA>
## 1417	175.4947	-36.25654	4	1417	Great.Barrier.Island	<NA>
## 1418	175.5107	-36.21156	4	1418	Great.Barrier.Island	<NA>
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## 1420	175.4460	-36.13954	4	1420	Great.Barrier.Island	<NA>
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## 1423	175.3663	-36.15037	4	1423	Great.Barrier.Island	<NA>
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## 1431	175.5359	-36.39153	4	1431	Great.Barrier.Island	<NA>
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## 1434	166.5164	-45.84877	5	1434	Resolution.Island	<NA>
## 1435	166.5468	-45.88836	5	1435	Resolution.Island	<NA>
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## 1522	174.8891	-36.47615	13	1522	Kawau.Island	<NA>
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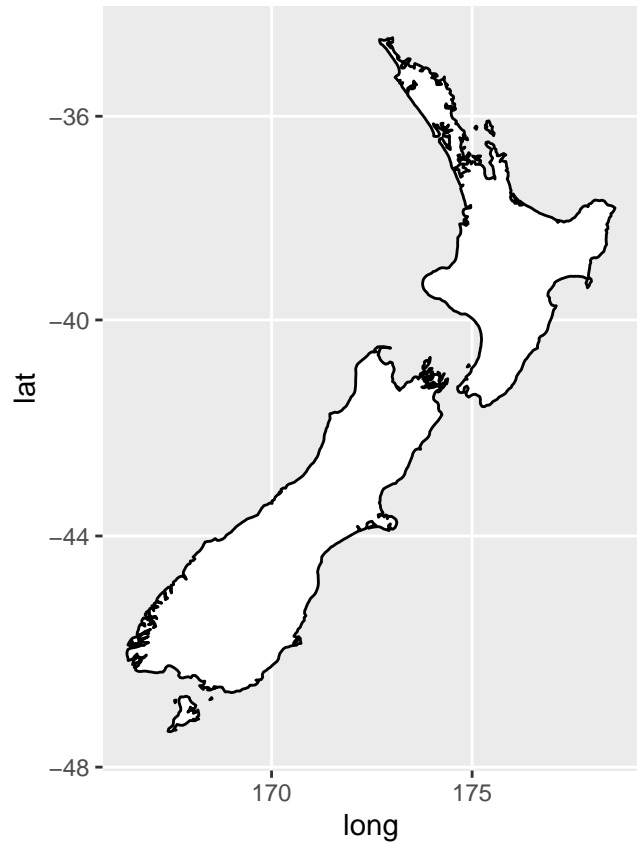

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## 1552 173.1186 -41.25875 18 1552 Rabbit.Island <NA>
## 1553 173.1163 -41.25697 18 1553 Rabbit.Island <NA>
## 1555 167.5798 -46.87385 19 1555 Codfish.Island <NA>
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## 1573 166.4580 -45.93695 22 1573 Anchor.Island <NA>
```

```
ggplot(nz, aes(
  long, lat, group = group
)) +
  geom_polygon(fill = "white", color = "black") +
  coord_quickmap()
```



quickmap mantém a proporção correta dos mapas.

```
ggplot(nz, aes(
  long, lat, group = group
)) +
  geom_polygon(fill = "white", color = "black") +
  coord_map()
```



`coord_map` utiliza-se mapas de projeção de 3 dimensões.. projeção de mercator

`coord_quickmap` é a plotagem mais rapida, porem ela ignora a curvatura da terra e ajusta o mapa para lat/long ratio

exer 4

```
p<- ggplot(
  data = mpg, mapping = aes(
    x = cty, y = hwy
  )
) + geom_point() +
  geom_abline()

p + coord_fixed()
```

