

HW Sprint 05 Exploratory Data Analysis in R Programming

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Install Packages and Load Library

```
install.packages("tidyverse")

## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
## (as 'lib' is unspecified)

library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.2 --
## v ggplot2 3.3.6      v purrr  0.3.4
## v tibble  3.1.8      v dplyr  1.0.10
## v tidyr   1.2.1      v stringr 1.4.1
## v readr   2.1.2      v forcats 0.5.2
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

library(dplyr)
library(ggthemes)
library(RColorBrewer)
```

Review Data

```
glimpse(diamonds)

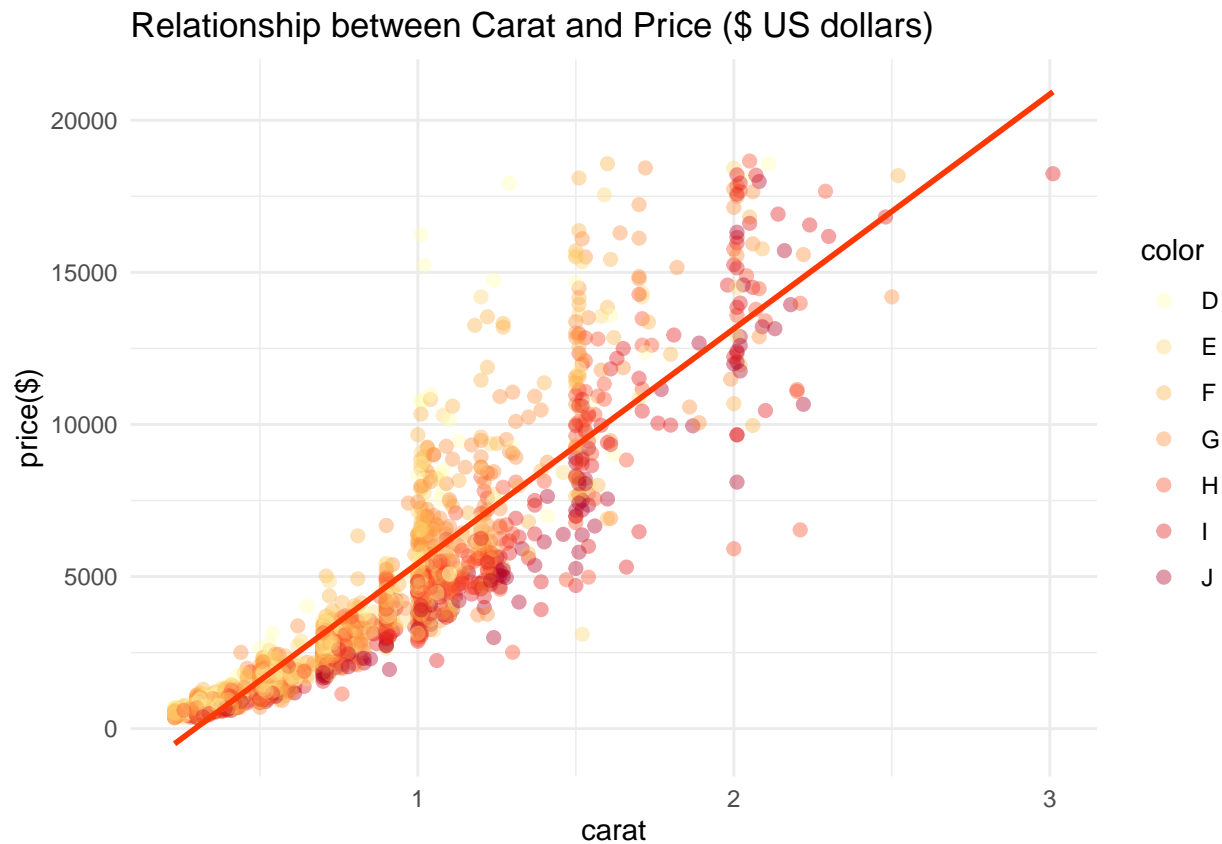
## Rows: 53,940
## Columns: 10
## $ carat <dbl> 0.23, 0.21, 0.23, 0.29, 0.31, 0.24, 0.24, 0.26, 0.22, 0.23, 0.~
## $ cut <ord> Ideal, Premium, Good, Premium, Good, Very Good, Very Good, Ver~
## $ color <ord> E, E, E, I, J, J, I, H, E, H, J, J, F, J, E, E, I, J, J, J, I,~
## $ clarity <ord> SI2, SI1, VS1, VS2, SI2, VVS2, VVS1, SI1, VS2, VS1, SI1, VS1, ~
## $ depth <dbl> 61.5, 59.8, 56.9, 62.4, 63.3, 62.8, 62.3, 61.9, 65.1, 59.4, 64~
## $ table <dbl> 55, 61, 65, 58, 58, 57, 57, 55, 61, 61, 55, 56, 61, 54, 62, 58~
## $ price <int> 326, 326, 327, 334, 335, 336, 336, 337, 337, 338, 339, 340, 34~
## $ x <dbl> 3.95, 3.89, 4.05, 4.20, 4.34, 3.94, 3.95, 4.07, 3.87, 4.00, 4.~
## $ y <dbl> 3.98, 3.84, 4.07, 4.23, 4.35, 3.96, 3.98, 4.11, 3.78, 4.05, 4.~
## $ z <dbl> 2.43, 2.31, 2.31, 2.63, 2.75, 2.48, 2.47, 2.53, 2.49, 2.39, 2.~
```

Create New Data Visualization

1.Relationship between Carat Weight and Diamonds Price (\$ US dollars)

```
set.seed(55)
diamonds |>
  sample_n(2000) |>
  ggplot( aes(carat, price)) +
  geom_point(size = 2, alpha = 0.4, aes(color = color)) +
  geom_smooth(method = "lm", color = "#fc3903", se = F) +
  labs(title = "Relationship between Carat and Price ($ US dollars)",
       x = "carat",
       y = "price($)" ) +
  theme_minimal() +
  scale_color_brewer(palette = "YlOrRd")
```

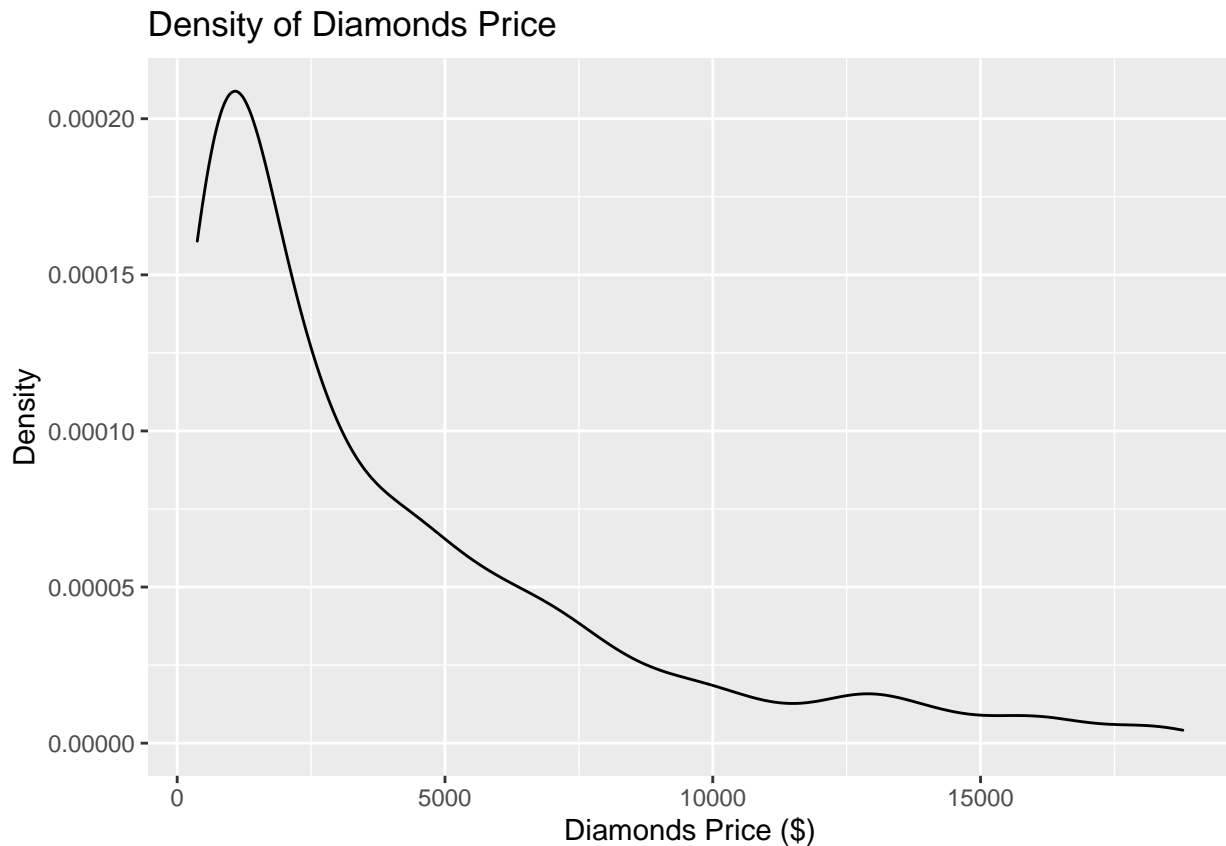
`geom_smooth()` using formula 'y ~ x'



2.Density of Diamonds Price

```
set.seed(64)
diamonds |>
  sample_n(1000) |>
  ggplot( aes(price)) +
```

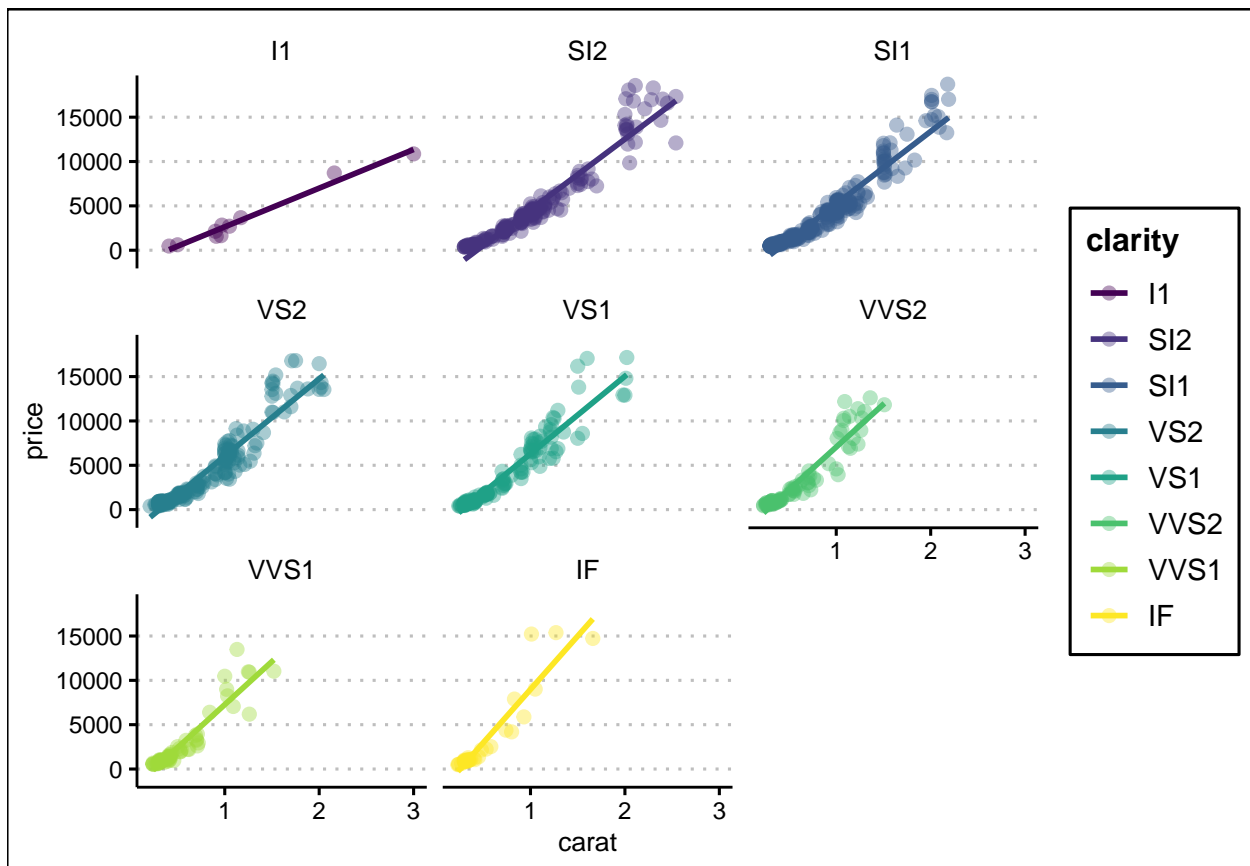
```
geom_density() +
labs(title = "Density of Diamonds Price",
      x = "Diamonds Price ($)",
      y = "Density")
```



3. Correlation between Carat Weight and Diamonds Price (Group by Clarity)

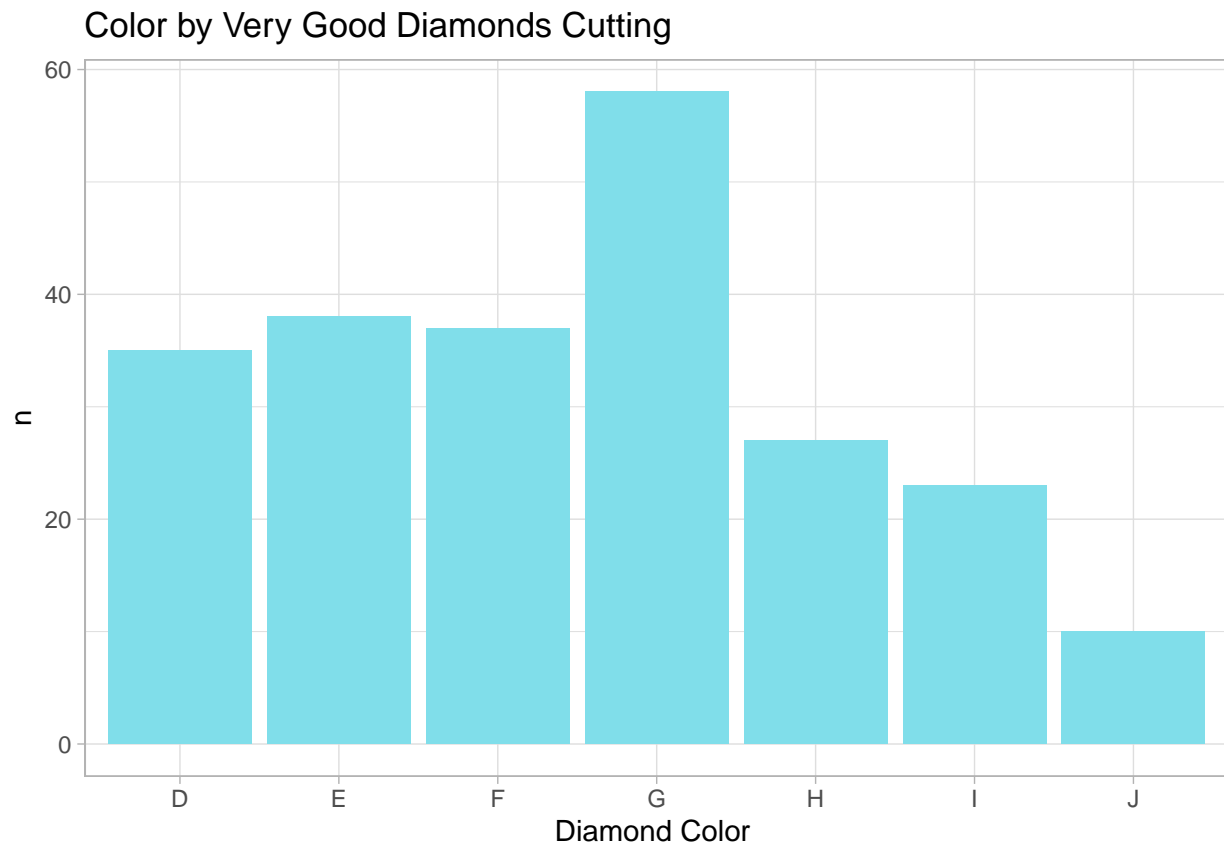
```
set.seed(99)
diamonds |>
  sample_n(1000) |>
  ggplot(aes(carat, price, color = clarity)) +
  geom_point(size = 2, alpha = 0.4) +
  geom_smooth(method = "lm", se = F) +
  facet_wrap(~ clarity) +
  theme_clean()
```

```
## `geom_smooth()` using formula 'y ~ x'
```



4. Very Good cutting Diamonds by color

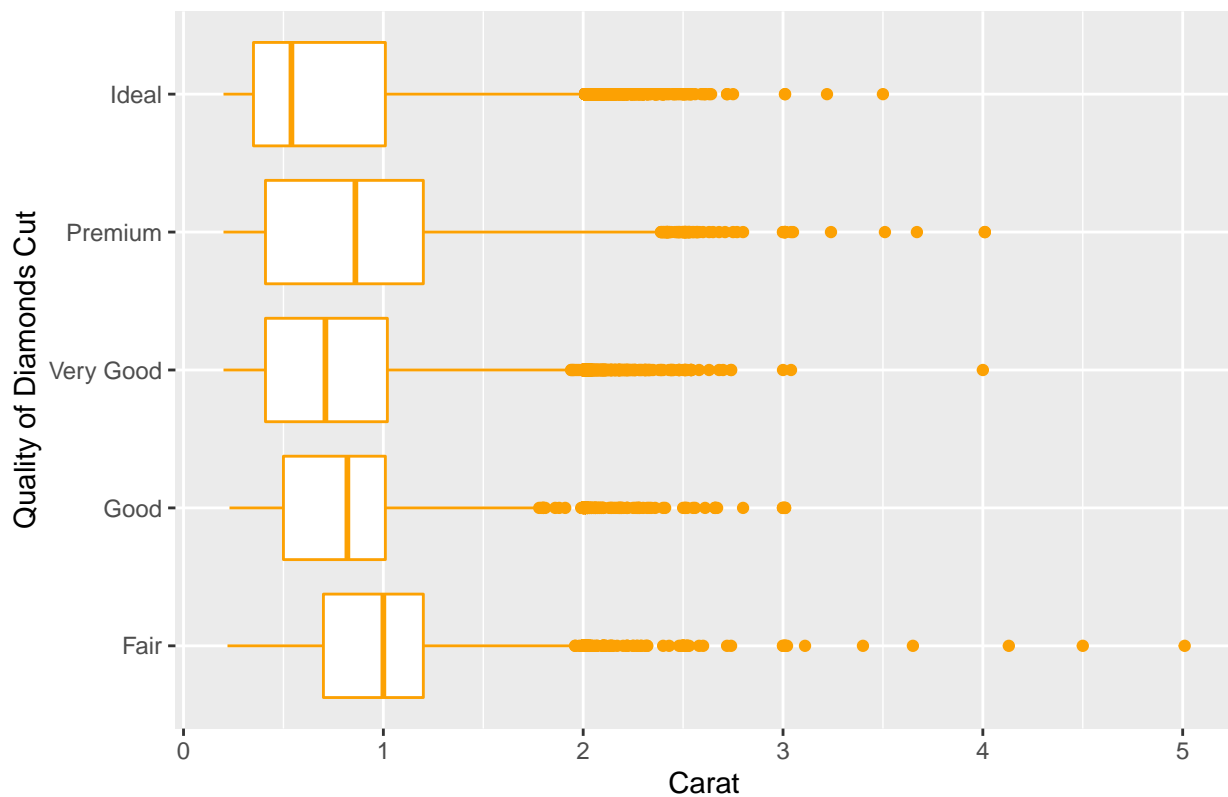
```
set.seed(46)
diamond <- sample_n(diamonds, 1000)
filter_data2 <- diamond %>% filter(cut == "Very Good")
ggplot(filter_data2, aes(color)) +
  labs(title = "Color by Very Good Diamonds Cutting",
       x = "Diamond Color ",
       y = "n") +
  geom_bar(fill = "#80deea") +
  theme_light()
```



5.Box Plot between Carat Weight and Quality of Diamonds Cut

```
ggplot(diamonds, aes(carat, cut)) +  
  geom_boxplot(color = "#fca103") +  
  labs(title = "Box Plot between Carat Weight and Quality of Diamonds Cut",  
        x = "Carat",  
        y = "Quality of Diamonds Cut")
```

Box Plot between Carat Weight and Quality of Diamonds Cut



```
theme_gray()
```

```
## List of 93
## $ line                               :List of 6
## ..$ colour                          : chr "black"
## ..$ size                             : num 0.5
## ..$ linetype                         : num 1
## ..$ lineend                         : chr "butt"
## ..$ arrow                           : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ rect                               :List of 5
## ..$ fill                             : chr "white"
## ..$ colour                          : chr "black"
## ..$ size                             : num 0.5
## ..$ linetype                         : num 1
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ text                               :List of 11
## ..$ family                          : chr ""
## ..$ face                            : chr "plain"
## ..$ colour                          : chr "black"
## ..$ size                             : num 11
## ..$ hjust                           : num 0.5
## ..$ vjust                           : num 0.5
## ..$ angle                           : num 0
## ..$ lineheight                      : num 0.9
```

```

## ..$ margin      : 'margin' num [1:4] 0points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ title         : NULL
## $ aspect.ratio   : NULL
## $ axis.title      : NULL
## $ axis.title.x    :List of 11
## ..$ family      : NULL
## ..$ face         : NULL
## ..$ colour       : NULL
## ..$ size         : NULL
## ..$ hjust        : NULL
## ..$ vjust        : num 1
## ..$ angle        : NULL
## ..$ lineheight    : NULL
## ..$ margin      : 'margin' num [1:4] 2.75points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.top :List of 11
## ..$ family      : NULL
## ..$ face         : NULL
## ..$ colour       : NULL
## ..$ size         : NULL
## ..$ hjust        : NULL
## ..$ vjust        : num 0
## ..$ angle        : NULL
## ..$ lineheight    : NULL
## ..$ margin      : 'margin' num [1:4] 0points 0points 2.75points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.bottom : NULL
## $ axis.title.y        :List of 11
## ..$ family      : NULL
## ..$ face         : NULL
## ..$ colour       : NULL
## ..$ size         : NULL
## ..$ hjust        : NULL
## ..$ vjust        : num 1
## ..$ angle        : num 90
## ..$ lineheight    : NULL
## ..$ margin      : 'margin' num [1:4] 0points 2.75points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.y.left   : NULL
## $ axis.title.y.right  :List of 11
## ..$ family          : NULL

```

```

## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 0
## ..$ angle         : num -90
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 0points 0points 2.75points
## ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text       :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : chr "grey30"
## ..$ size          : 'rel' num 0.8
## ..$ hjust         : NULL
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : NULL
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x     :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 1
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 2.2points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.top :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 0
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 0points 2.2points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.bottom : NULL

```



```

## $ axis.text.y           :List of 11
## ..$ family             : NULL
## ..$ face               : NULL
## ..$ colour             : NULL
## ..$ size               : NULL
## ..$ hjust              : num 1
## ..$ vjust              : NULL
## ..$ angle              : NULL
## ..$ lineheight         : NULL
## ..$ margin             : 'margin' num [1:4] 0points 2.2points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug              : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.y.left      : NULL
## $ axis.text.y.right     :List of 11
## ..$ family             : NULL
## ..$ face               : NULL
## ..$ colour             : NULL
## ..$ size               : NULL
## ..$ hjust              : num 0
## ..$ vjust              : NULL
## ..$ angle              : NULL
## ..$ lineheight         : NULL
## ..$ margin             : 'margin' num [1:4] 0points 0points 0points 2.2points
## ..- attr(*, "unit")= int 8
## ..$ debug              : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.ticks            :List of 6
## ..$ colour             : chr "grey20"
## ..$ size               : NULL
## ..$ linetype           : NULL
## ..$ lineend            : NULL
## ..$ arrow              : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ axis.ticks.x          : NULL
## $ axis.ticks.x.top      : NULL
## $ axis.ticks.x.bottom   : NULL
## $ axis.ticks.y          : NULL
## $ axis.ticks.y.left     : NULL
## $ axis.ticks.y.right    : NULL
## $ axis.ticks.length     : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ axis.ticks.length.x   : NULL
## $ axis.ticks.length.x.top : NULL
## $ axis.ticks.length.x.bottom: NULL
## $ axis.ticks.length.y   : NULL
## $ axis.ticks.length.y.left : NULL
## $ axis.ticks.length.y.right : NULL
## $ axis.line             : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.line.x          : NULL

```

```

## $ axis.line.x.top           : NULL
## $ axis.line.x.bottom       : NULL
## $ axis.line.y              : NULL
## $ axis.line.y.left         : NULL
## $ axis.line.y.right        : NULL
## $ legend.background        :List of 5
##   ..$ fill                 : NULL
##   ..$ colour               : logi NA
##   ..$ size                 : NULL
##   ..$ linetype             : NULL
##   ..$ inherit.blank: logi TRUE
##   .- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ legend.margin            : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
##   .- attr(*, "unit")= int 8
## $ legend.spacing          : 'simpleUnit' num 11points
##   .- attr(*, "unit")= int 8
## $ legend.spacing.x        : NULL
## $ legend.spacing.y        : NULL
## $ legend.key               :List of 5
##   ..$ fill                 : chr "grey95"
##   ..$ colour               : logi NA
##   ..$ size                 : NULL
##   ..$ linetype             : NULL
##   ..$ inherit.blank: logi TRUE
##   .- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ legend.key.size          : 'simpleUnit' num 1.2lines
##   .- attr(*, "unit")= int 3
## $ legend.key.height        : NULL
## $ legend.key.width         : NULL
## $ legend.text              :List of 11
##   ..$ family               : NULL
##   ..$ face                  : NULL
##   ..$ colour               : NULL
##   ..$ size                 : 'rel' num 0.8
##   ..$ hjust                : NULL
##   ..$ vjust                : NULL
##   ..$ angle                : NULL
##   ..$ lineheight           : NULL
##   ..$ margin               : NULL
##   ..$ debug                : NULL
##   ..$ inherit.blank: logi TRUE
##   .- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.text.align        : NULL
## $ legend.title             :List of 11
##   ..$ family               : NULL
##   ..$ face                  : NULL
##   ..$ colour               : NULL
##   ..$ size                 : NULL
##   ..$ hjust                : num 0
##   ..$ vjust                : NULL
##   ..$ angle                : NULL
##   ..$ lineheight           : NULL
##   ..$ margin               : NULL
##   ..$ debug                : NULL

```

```

## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.title.align      : NULL
## $ legend.position         : chr "right"
## $ legend.direction        : NULL
## $ legend.justification    : chr "center"
## $ legend.box              : NULL
## $ legend.box.just         : NULL
## $ legend.box.margin       : 'margin' num [1:4] 0cm 0cm 0cm 0cm
## ..- attr(*, "unit")= int 1
## $ legend.box.background   : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.box.spacing     : 'simpleUnit' num 11points
## ..- attr(*, "unit")= int 8
## $ panel.background        :List of 5
## ..$ fill                  : chr "grey92"
## ..$ colour                : logi NA
## ..$ size                  : NULL
## ..$ linetype              : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ panel.border            : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ panel.spacing          : 'simpleUnit' num 5.5points
## ..- attr(*, "unit")= int 8
## $ panel.spacing.x        : NULL
## $ panel.spacing.y        : NULL
## $ panel.grid              :List of 6
## ..$ colour                : chr "white"
## ..$ size                  : NULL
## ..$ linetype              : NULL
## ..$ lineend               : NULL
## ..$ arrow                 : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major        : NULL
## $ panel.grid.minor        :List of 6
## ..$ colour                : NULL
## ..$ size                  : 'rel' num 0.5
## ..$ linetype              : NULL
## ..$ lineend               : NULL
## ..$ arrow                 : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ panel.grid.major.x      : NULL
## $ panel.grid.major.y      : NULL
## $ panel.grid.minor.x      : NULL
## $ panel.grid.minor.y      : NULL
## $ panel.ontop              : logi FALSE
## $ plot.background         :List of 5
## ..$ fill                  : NULL
## ..$ colour                : chr "white"
## ..$ size                  : NULL
## ..$ linetype              : NULL

```

```

## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ plot.title :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : 'rel' num 1.2
## ..$ hjust : num 0
## ..$ vjust : num 1
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 0points 0points 5.5points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.title.position : chr "panel"
## $ plot.subtitle :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : num 0
## ..$ vjust : num 1
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 0points 0points 5.5points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : 'rel' num 0.8
## ..$ hjust : num 1
## ..$ vjust : num 1
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 5.5points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption.position : chr "panel"
## $ plot.tag :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : 'rel' num 1.2
## ..$ hjust : num 0.5
## ..$ vjust : num 0.5
## ..$ angle : NULL

```

```

## ..$ lineheight : NULL
## ..$ margin : NULL
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.tag.position : chr "topleft"
## $ plot.margin : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ strip.background :List of 5
## ..$ fill : chr "grey85"
## ..$ colour : logi NA
## ..$ size : NULL
## ..$ linetype : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ strip.background.x : NULL
## $ strip.background.y : NULL
## $ strip.placement : chr "inside"
## $ strip.text :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : chr "grey10"
## ..$ size : 'rel' num 0.8
## ..$ hjust : NULL
## ..$ vjust : NULL
## ..$ angle : NULL
## ..$ lineheight : NULL
## ..$ margin : 'margin' num [1:4] 4.4points 4.4points 4.4points 4.4points
## ..- attr(*, "unit")= int 8
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.text.x : NULL
## $ strip.text.y :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL
## ..$ size : NULL
## ..$ hjust : NULL
## ..$ vjust : NULL
## ..$ angle : num -90
## ..$ lineheight : NULL
## ..$ margin : NULL
## ..$ debug : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.text.y.left :List of 11
## ..$ family : NULL
## ..$ face : NULL
## ..$ colour : NULL

```

```

## ..$ size      : NULL
## ..$ hjust     : NULL
## ..$ vjust     : NULL
## ..$ angle     : num 90
## ..$ lineheight : NULL
## ..$ margin    : NULL
## ..$ debug     : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE

```