

Data Visualization

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Diamonds Dataset

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.2.2
```

```
##
```

```
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
```

```
##
```

```
##      filter, lag
```

```
## The following objects are masked from 'package:base':
```

```
##
```

```
##      intersect, setdiff, setequal, union
```

```
library(patchwork)
```

```
## Warning: package 'patchwork' was built under R version 4.2.2
```

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.2.2
```

```
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~
```

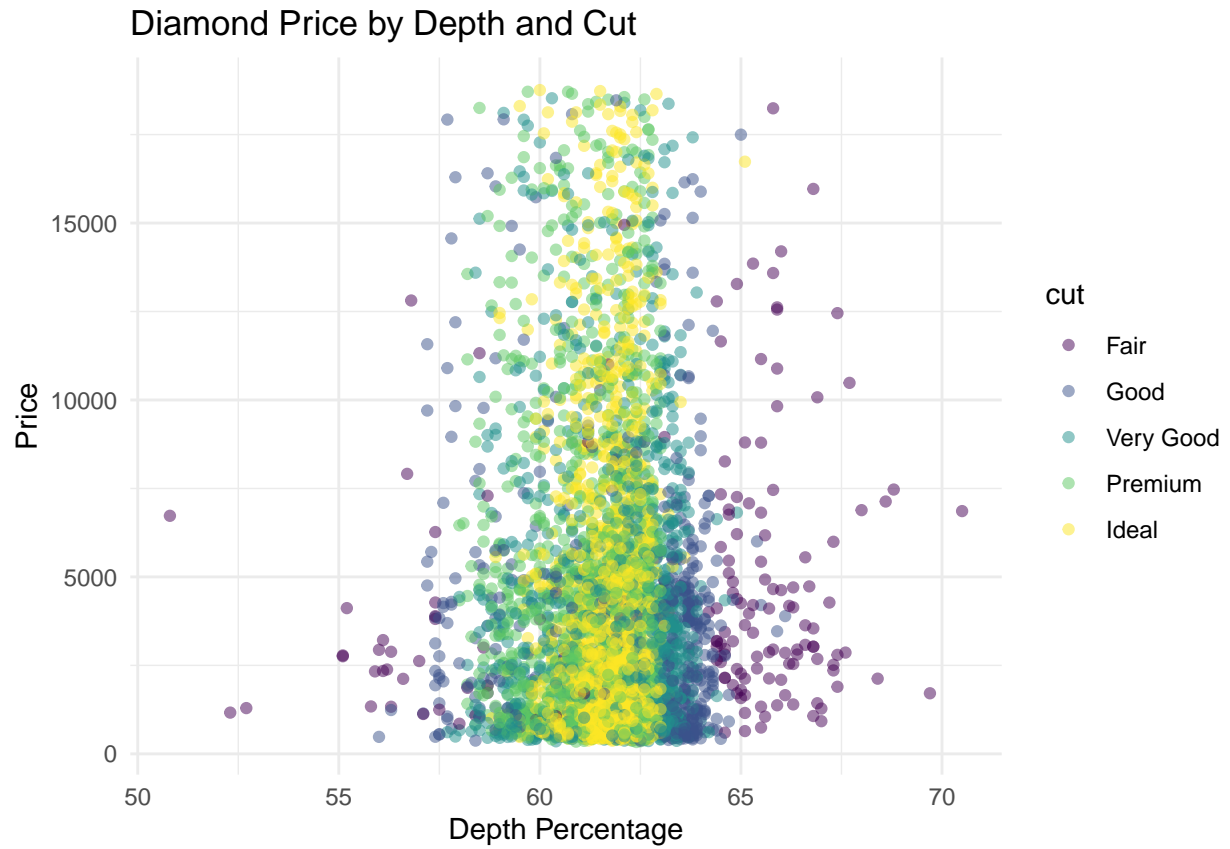
```
## $ x        <dbl> 3.95, 3.89, 4.05, 4.20, 4.34, 3.94, 3.95, 4.07, 3.87, 4.00, 4.~
```

```
## $ y        <dbl> 3.98, 3.84, 4.07, 4.23, 4.35, 3.96, 3.98, 4.11, 3.78, 4.05, 4.~
```

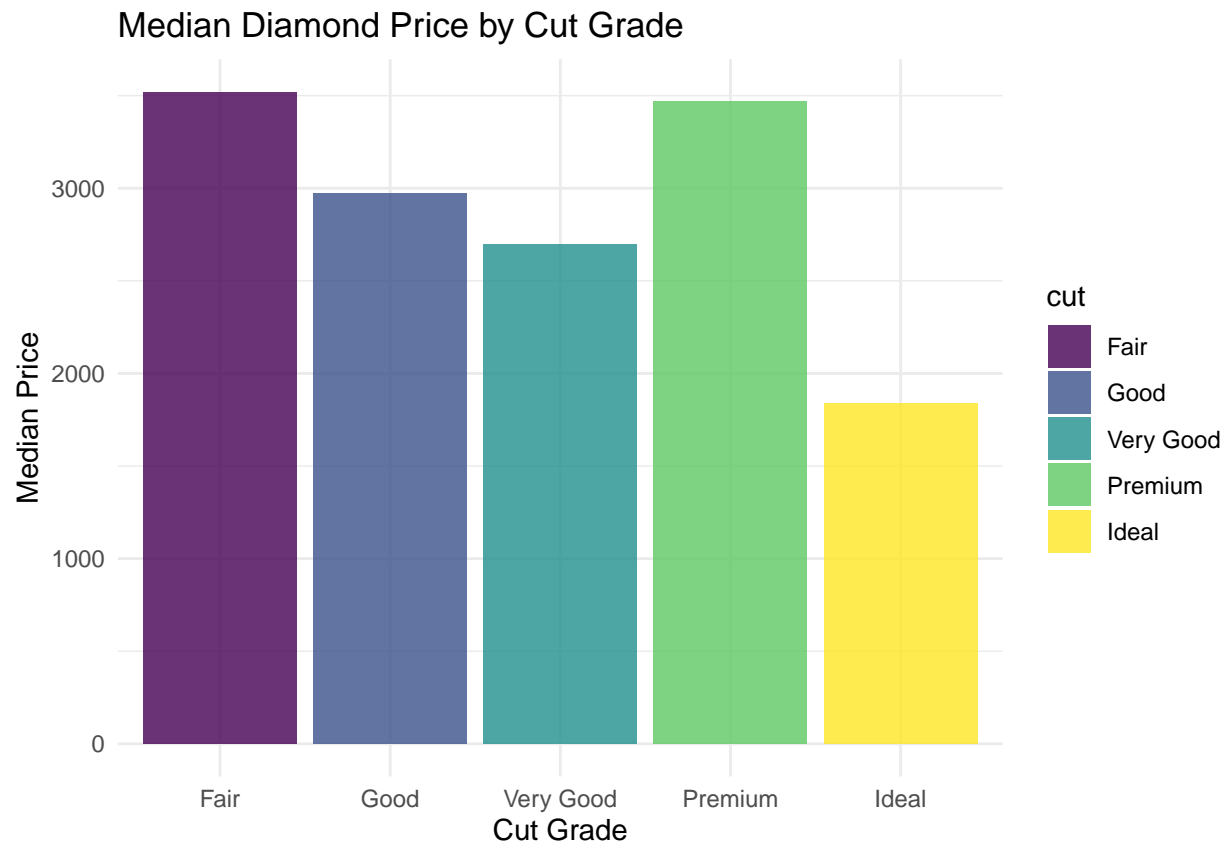
```
## $ z        <dbl> 2.43, 2.31, 2.31, 2.63, 2.75, 2.48, 2.47, 2.53, 2.49, 2.39, 2.~
```

```
d <- diamonds
```

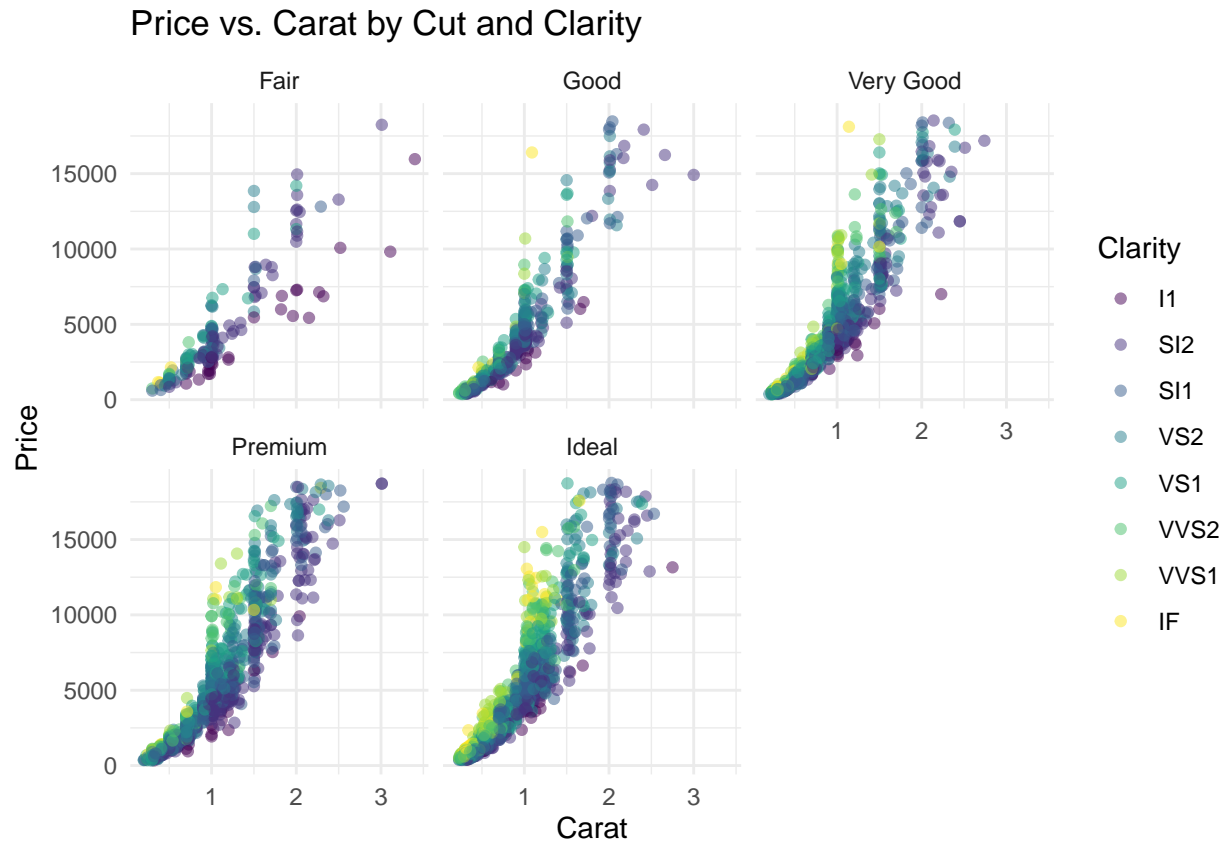
Q1 How does the depth percentage of a diamond, cut affect its price?



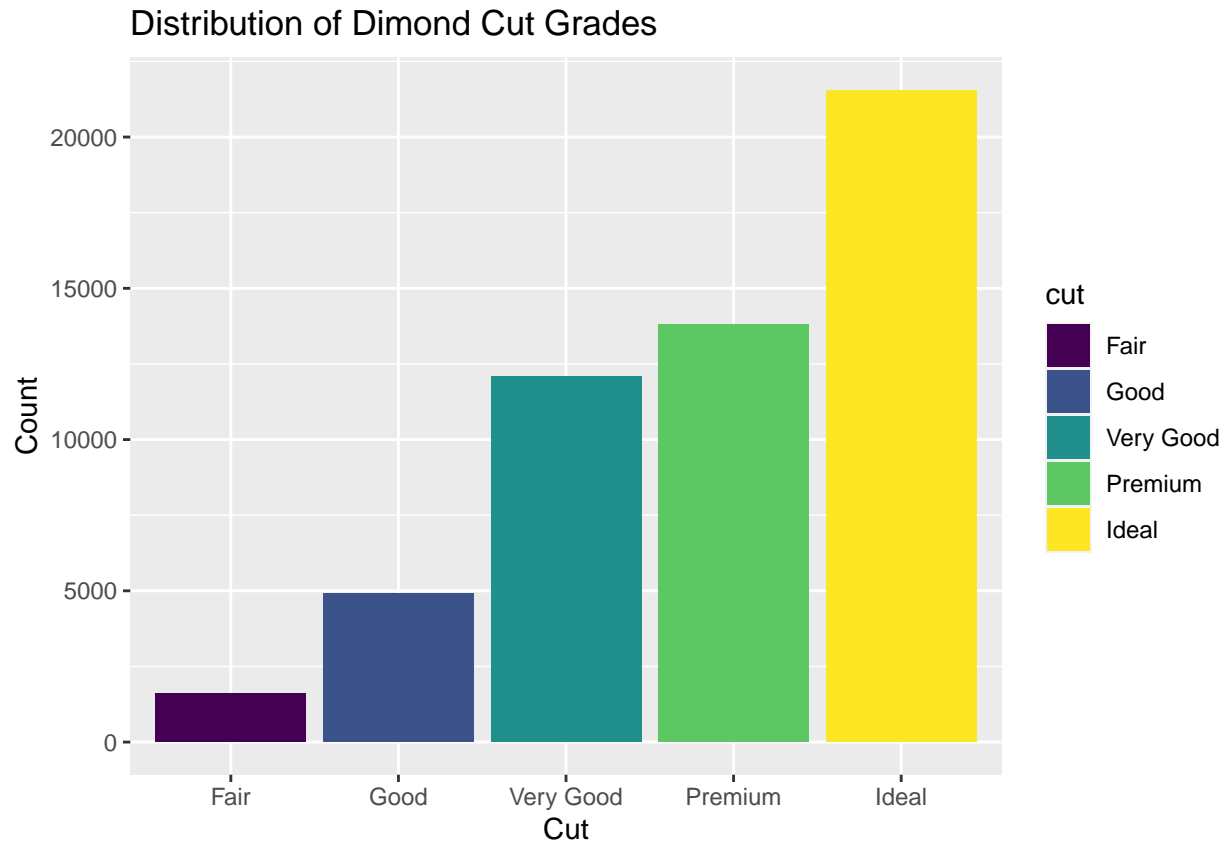
Q2 What is the median price of diamonds in the dataset by cut grade?



Q3 Diamond price vs. carat weight



Q4 What is the distribution of diamond cut grades in the dataset?



```
## List of 97
## $ line                               :List of 6
##   ..$ colour       : chr "black"
##   ..$ linewidth    : 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"
##   ..$ linewidth     : 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()
## ..- attr(*, "class")= chr [1:2] "element_blank" "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()
##   .- attr(*, "class")= chr [1:2] "element_blank" "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()
##   .- attr(*, "class")= chr [1:2] "element_blank" "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()

```

```

##   ..- attr(*, "class")= chr [1:2] "element_blank" "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 "grey92"
##   ..$ linewidth         : 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
##   ..$ linewidth         : '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()
##   ..- attr(*, "class")= chr [1:2] "element_blank" "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()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ strip.background.x : NULL
## $ strip.background.y : NULL
## $ strip.clip : chr "inherit"
## $ 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.x.bottom : NULL
## $ strip.text.x.top   : 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.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"
## $ strip.text.y.right : NULL
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE

```

Q5 What is the average price of diamonds in the dataset by table percentage?

