Visualizing Data Using ggplot2

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Q1 - Factor variables analysis

Question: (1 point) How many factor variables in this data set? Use R command *str(diamonds)* to find it. For each factor variable, find the one-way frequency table for it. An example of cut variable is given in the solution template.

Answer: We have 3 factor variables. They are cut (with 5 levels),color(with 7 levels), clarity(with 8 levels).

```
library(ggplot2)
# read in the file
data(diamonds)

# check the type of variables in this data
str(diamonds)
```

```
## Classes 'tbl_df', 'tbl' and 'data.frame':    53940 obs. of  10 variables:
##  $ carat  : num  0.23 0.21 0.23 0.29 0.31 0.24 0.24 0.26 0.22 0.23 ...
##  $ cut    : Ord.factor w/ 5 levels "Fair"<"Good"<..: 5 4 2 4 2 3 3 3 1 3 ...
##  $ color  : Ord.factor w/ 7 levels "D"<"E"<"F"<"G"<..: 2 2 2 6 7 7 6 5 2 5 ...
##  $ clarity: Ord.factor w/ 8 levels "I1"<"SI2"<"SI1"<..: 2 3 5 4 2 6 7 3 4 5 ...
##  $ depth  : num  61.5 59.8 56.9 62.4 63.3 62.8 62.3 61.9 65.1 59.4 ...
##  $ table  : num  55 61 65 58 58 57 57 55 61 61 ...
##  $ price  : int  326 326 327 334 335 336 336 337 337 338 ...
##  $ x      : num  3.95 3.89 4.05 4.2 4.34 3.94 3.95 4.07 3.87 4 ...
##  $ y      : num  3.98 3.84 4.07 4.23 4.35 3.96 3.98 4.11 3.78 4.05 ...
##  $ z      : num  2.43 2.31 2.31 2.63 2.75 2.48 2.47 2.53 2.49 2.39 ...
```

```
# observations for each level of "cut" variable
table(diamonds$cut) # or summary(diamonds$cut)
```

```
##
##      Fair      Good Very Good   Premium     Ideal
##      1610      4906     12082     13791     21551
```

```
# find the level frequency of "cut" varible
prop.table( table(diamonds$cut) ) # or summary(diamonds$cut)/nrow(diamonds)
```

```
##
##       Fair       Good  Very Good    Premium      Ideal
## 0.02984798 0.09095291 0.22398962 0.25567297 0.39953652
```

```r
# find the level frequency of "color" variable
prop.table( table(diamonds$color) )
```

```
##
##          D          E          F          G          H          I
## 0.12560252 0.18162773 0.17690026 0.20934372 0.15394883 0.10051910
##          J
## 0.05205784
```

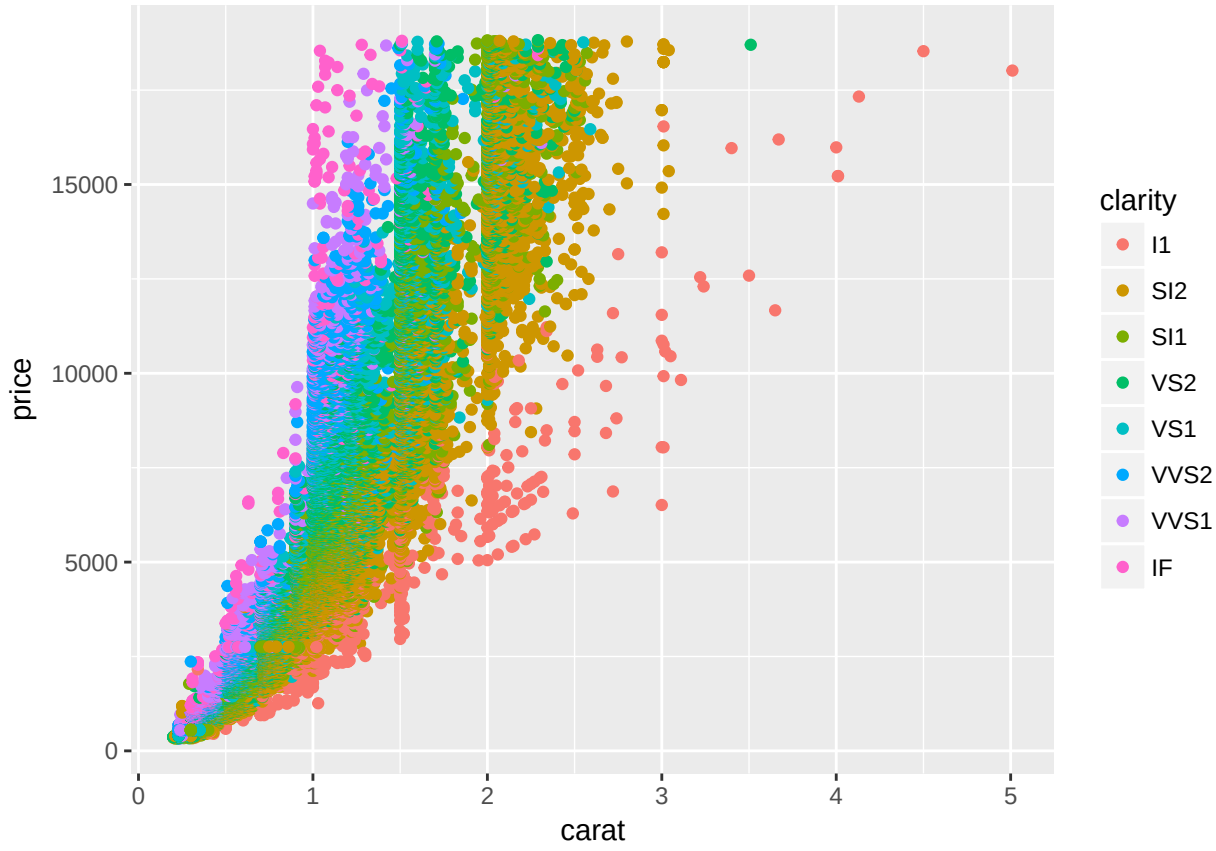
```r
# find the level frequency of "clarity" variable
prop.table( table(diamonds$clarity) )
```

```
##
##         I1        SI2        SI1        VS2        VS1       VVS2
## 0.01373749 0.17044865 0.24221357 0.22725250 0.15148313 0.09391917
##       VVS1         IF
## 0.06776047 0.03318502
```

Q2 -Produce plot and give comment

Scatter plot

```
library(ggplot2)
library(plyr)
# read in the data file
data(diamonds)
qplot(carat, price, data = diamonds, colour = clarity)
```



Comments:

Price always increases with all the levels of clarity. Price grows close to linear when the carat has the worst clarity. As the clarity increases the price starts to grow quadratically. When the carat has the best clarity(IF) price grows the fastest. So from this plot we can see that carat clarity has a big effect on the price.