Lab1

Introduction

Background

A research community studied government policies' influence in fostering a healthy broadband market. While it was revealed that U.S. is among the few countries that did not adopt open access policies out of all OECD countries, network owners insist that attempts to regulate prices or mandate greater penetration will reduce incentives to invest in modern equipment, and thus, there is a trade-off among price, speed, and penetration. We are analyzing 3 sets of data - Price, Penetration, Speed - to examine if there are positive/negative relationship between Speed(quality of network) and price and/or penetration. More explicitly: 1) Does the network quality(Speed) falls if price is held low? Positive relationship? 2) Does the network quality(Speed) falls if penetration is forced high? Negative relationship?

Setup

First, we load the data into R. We do this using dplyr to take advantage of its table manipulation methods. For easy access, we join the three datasets together. A simple full_join is sufficient.

```
library(dplyr)
```

```
##
## 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(car)
```

```
##
## Attaching package: 'car'
```

```
## The following object is masked from 'package:dplyr':
##
##     recode
```

```
t1 = as_tibble(read.csv('Penetration.csv', stringsAsFactors = F))
t2 = as_tibble(read.csv('Price.csv', stringsAsFactors = F))
t3 = as_tibble(read.csv('Speed.csv', stringsAsFactors = F))

t = t1 %>% full_join(t2) %>% full_join(t3)
```

```
## Joining, by = c("Country", "Country.Code")
```

```
## Joining, by = "Country"
```

```
str(t)
```

```
## Classes 'tbl_df', 'tbl' and 'data.frame':    32 obs. of  33 variables:
##  $ Country                                   : chr  "Australia" "Austria" "Belgium" "Canada" ...
```

```
##  $ Country.Code                                : chr  "AU" "AT" "BE" "CA" ...
##  $ Penetration.per.100.OECD..2008              : num  25.4 21.6 28.1 29 17.2 ...
##  $ Penetration.per.100.OECD..2007              : num  22.8 19.6 25.8 27.2 14.6 ...
##  $ Household.penetration..OECD                 : num  52 46.1 56.4 64.2 28.1 ...
##  $ X2G.and.3G.penetration.per.100..OECD        : num  102.1 118.5 96.3 62.1 127.3 ...
##  $ Penetration.per.100.GC                      : num  28.6 20.9 29.1 26.8 15.7 36.9 31.1 27.5 26.7 13
##  $ X3G.penetration.per.100                     : num  55.26 32.37 20.05 6.61 10.19 ...
##  $ Growth.in.3G.penetration                    : chr  "510.90%" "339.30%" "239.70%" "225.50%" ...
##  $ Wi.Fi.hotspots..JiWire                      : int  2611 986 2318 3576 429 1206 750 25625 14512 531
##  $ Wi.Fi.hotspots.per.100.000..JiWire          : num  12.26 12.02 22.29 10.67 4.21 ...
##  $ Percent.of.population.in.urban.areas        : chr  "88%" "66%" "97%" "80%" ...
##  $ X                                           : logi  NA NA NA NA NA NA ...
##  $ Price.for.low.speeds..combined              : chr  " $51.86 " " $31.55 " "" " $28.02 " ...
##  $ Price.for.med.speeds..combined              : chr  " $61.02 " " $30.76 " " $31.61 " " $40.48 " ...
##  $ Price.for.high.speeds..combined             : chr  " $60.19 " " $52.54 " " $50.41 " " $63.77 " ...
##  $ Price.for.very.high.speeds..combined        : chr  "" " $80.07" "" " $121.94" ...
##  $ Country.code                                : chr  "AU" "AT" "BE" "CA" ...
##  $ Maximum.advertised.speed.OECD..kbps.        : chr  " 30,000 " " 25,600 " " 20,000 " " 25,000 " ...
##  $ Average.advertised.speed.OECD..kbps.        : chr  " 15,539 " " 10,292 " " 7,544 " " 6,236 " ...
##  $ Average.actual.speed..Akamai..kbps.         : chr  " 2,499 " " 3,773 " " 4,737 " " 3,786 " ...
##  $ Average.download.speedtest.net..kbps.       : chr  " 4,602 " " 5,683 " " 6,908 " " 4,783 " ...
##  $ Standard.deviation.download..speedtest.net: chr  " 6,504 " " 10,049 " " 9,754 " " 6,528 " ...
##  $ Average.upload.speedtest.net..kbps.         : chr  " 641 " " 973 " " 708 " " 876 " ...
##  $ Standard.deviation.upload..speedtest.net    : chr  " 2,298 " " 2,847 " " 2,762 " " 2,940 " ...
##  $ Average.latency.speedtest.net               : num  162 115 87 127 102 100 130 145 123 133 ...
##  $ Standard.deviation.latency..speedtest.net   : chr  " 370 " " 271 " " 246 " " 309 " ...
##  $ Median.download..speedtest.net..kbps.       : chr  " 2,550 " " 3,159 " " 3,954 " " 3,399 " ...
##  $ Median.upload..speedtest.net..kbps.         : chr  " 345 " " 455 " " 394 " " 531 " ...
##  $ Median.latency..speedtest.net               : int  68 53 42 62 39 43 48 89 61 68 ...
##  $ X90p..Download..speedtest.net..kbps.        : chr  " 10,676 " " 12,338 " " 14,911 " " 9,356 " ...
##  $ X90p..Upload..speedtest.net..kbps.          : chr  " 853 " " 1,467 " " 922 " " 960 " ...
##  $ X10p..Latency..speedtest.net                : int  22 18 18 19 10 11 14 34 21 26 ...
```

Cleansing

We see a couple of issues with the data: 1. There are two blank rows at the bottom, which We filter out of the table.
2. The 'X' variable seems to be empty, so we omit that column. 3. Due to a typo in the original data, Both 'Country.Code' and 'Country.code' exist. We omit the latter. 4. There are percent signs, dollar signs, and commas being used as decimal separators. There's probably some R function better than read.csv for cleaning these columns, but let's use some regular expressions just for fun.

```
clean_percent = function(x) as.numeric(gsub('%', '', x))
clean_dollar = function(x) as.numeric(gsub('\\$', '', x))
clean_commas = function(x) as.numeric(gsub(',', '', x))

t = t %>%
    filter(Country != '') %>%
    select(-c(X, Country.code)) %>%
    mutate(Growth.in.3G.penetration = clean_percent(Growth.in.3G.penetration)) %>%
    mutate(Percent.of.population.in.urban.areas = clean_percent(Percent.of.population.in.urban.areas))

for (c in grep('Price', names(t))) t[c] = unlist(lapply(t[c], clean_dollar))
for (c in grep('Maximum|Average|Standard|Median|X90p', names(t))) t[c] = unlist(lapply(t[c], clean_comma
```

```
t$Country = factor(t$Country)
t$Country.Code = factor(t$Country.Code)
str(t)
```

```
## Classes 'tbl_df', 'tbl' and 'data.frame':    30 obs. of  31 variables:
##  $ Country                                  : Factor w/ 30 levels "Australia","Austria",..: 1 2 3 4
##  $ Country.Code                             : Factor w/ 30 levels "AT","AU","BE",..: 2 1 3 4 6 8 10
##  $ Penetration.per.100.OECD..2008           : num  25.4 21.6 28.1 29 17.2 ...
##  $ Penetration.per.100.OECD..2007           : num  22.8 19.6 25.8 27.2 14.6 ...
##  $ Household.penetration..OECD              : num  52 46.1 56.4 64.2 28.1 ...
##  $ X2G.and.3G.penetration.per.100..OECD     : num  102.1 118.5 96.3 62.1 127.3 ...
##  $ Penetration.per.100.GC                   : num  28.6 20.9 29.1 26.8 15.7 36.9 31.1 27.5 26.7 13
##  $ X3G.penetration.per.100                  : num  55.26 32.37 20.05 6.61 10.19 ...
##  $ Growth.in.3G.penetration                 : num  511 339 240 226 144 ...
##  $ Wi.Fi.hotspots..JiWire                   : int  2611 986 2318 3576 429 1206 750 25625 14512 531
##  $ Wi.Fi.hotspots.per.100.000..JiWire       : num  12.26 12.02 22.29 10.67 4.21 ...
##  $ Percent.of.population.in.urban.areas     : num  88 66 97 80 74 86 61 77 75 59 ...
##  $ Price.for.low.speeds..combined           : num  51.9 31.6 NA 28 32 ...
##  $ Price.for.med.speeds..combined           : num  61 30.8 31.6 40.5 43.4 ...
##  $ Price.for.high.speeds..combined          : num  60.2 52.5 50.4 63.8 68.8 ...
##  $ Price.for.very.high.speeds..combined     : num  NA 80.1 NA 121.9 105.9 ...
##  $ Maximum.advertised.speed.OECD..kbps.     : num  30000 25600 20000 25000 20480 ...
##  $ Average.advertised.speed.OECD..kbps.     : num  15539 10292 7544 6236 10468 ...
##  $ Average.actual.speed..Akamai..kbps.      : num  2499 3773 4737 3786 4381 ...
##  $ Average.download.speedtest.net..kbps.    : num  4602 5683 6908 4783 5776 ...
##  $ Standard.deviation.download..speedtest.net: num  6504 10049 9754 6528 8244 ...
##  $ Average.upload.speedtest.net..kbps.      : num  641 973 708 876 1847 ...
##  $ Standard.deviation.upload..speedtest.net : num  2298 2847 2762 2940 4901 ...
##  $ Average.latency.speedtest.net            : num  162 115 87 127 102 100 130 145 123 133 ...
##  $ Standard.deviation.latency..speedtest.net : num  370 271 246 309 205 217 281 297 251 253 ...
##  $ Median.download..speedtest.net..kbps.    : num  2550 3159 3954 3399 3614 ...
##  $ Median.upload..speedtest.net..kbps.      : num  345 455 394 531 524 777 646 665 592 452 ...
##  $ Median.latency..speedtest.net            : num  68 53 42 62 39 43 48 89 61 68 ...
##  $ X90p..Download..speedtest.net..kbps.     : num  10676 12338 14911 9356 11493 ...
##  $ X90p..Upload..speedtest.net..kbps.       : num  853 1467 922 960 3912 ...
##  $ X10p..Latency..speedtest.net             : int  22 18 18 19 10 11 14 34 21 26 ...
```

Now we have a tidy data set. All the columns hold either numeric or integer data with the exceptions of 'Country' and 'Country.Code'.

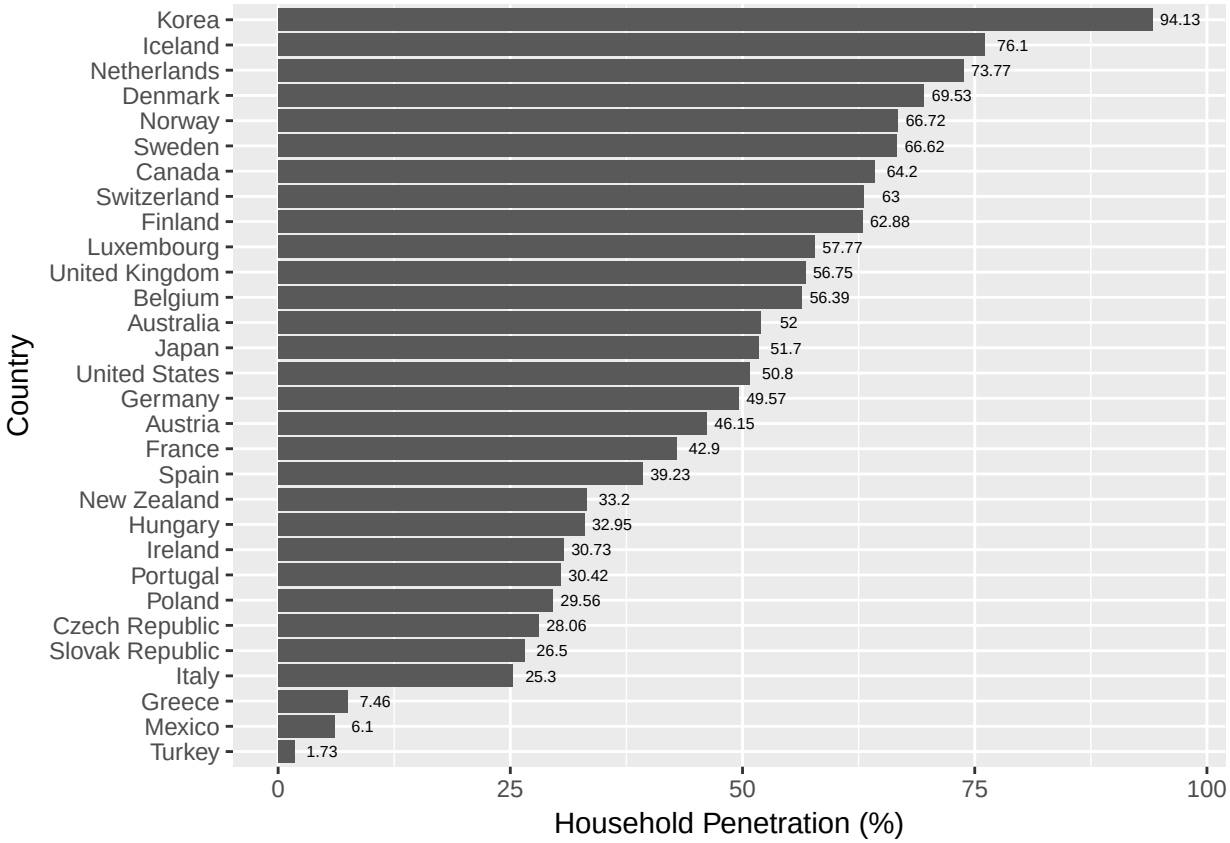
Univariate Analysis of Key Variables

First let's take a look at household penetration by country. I'm using ggplot2 because it makes better barplots than the base package.

```
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 3.4.2
```

```
ggplot(t, aes(x=reorder(Country, Household.penetration..OECD), y=Household.penetration..OECD)) +
    geom_bar(stat='identity') +
    geom_text(aes(label=Household.penetration..OECD), nudge_y = 3, size = 2) +
    labs(y = 'Household Penetration (%)', x = 'Country') +
    coord_flip()
```



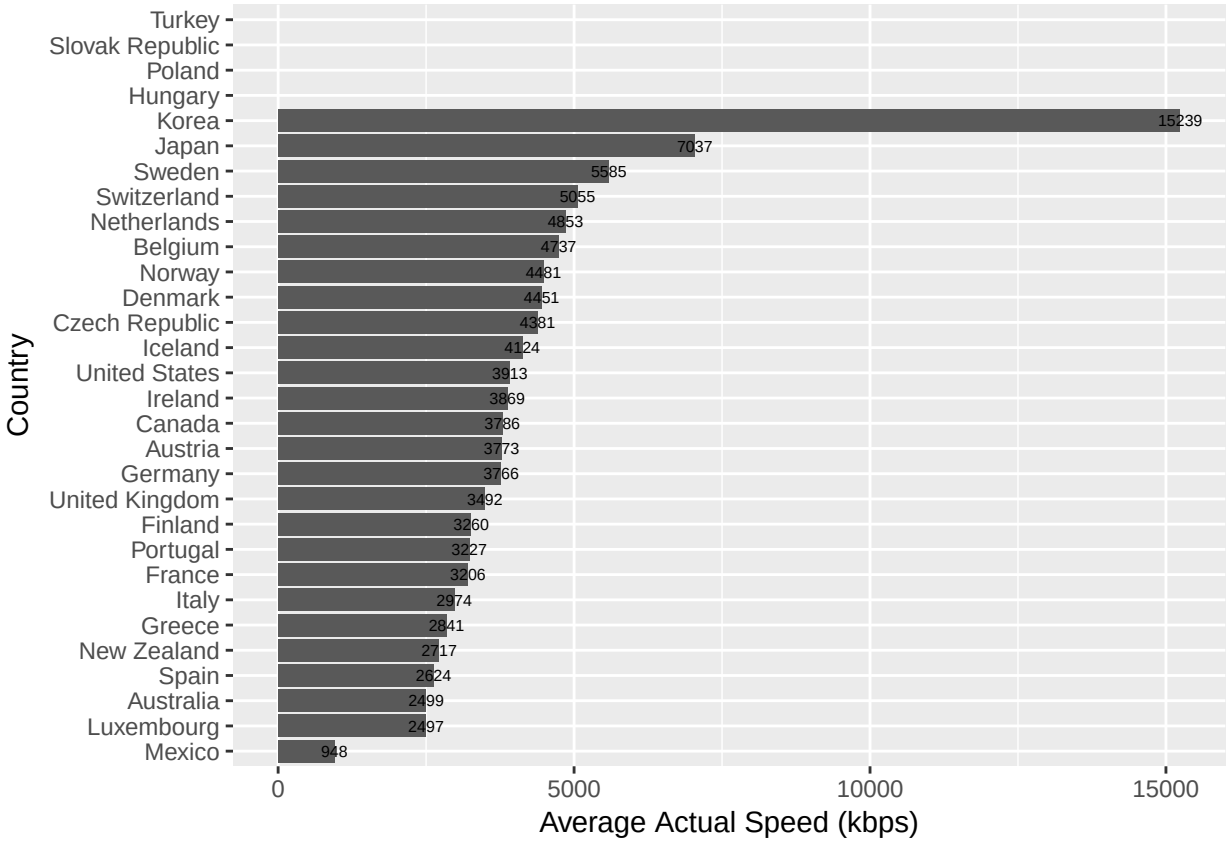
Korea has the highest Household penetration with 94.13%. The United States is pretty middle-of-the-road with 50.8%. Turkey has the lowest penetration at 1.73%.

Let's also take a look at average speed.

```
ggplot(t, aes(x=reorder(Country, Average.actual.speed..Akamai..kbps.), y=Average.actual.speed..Akamai..k
    geom_bar(stat='identity') +
    geom_text(aes(label=Average.actual.speed..Akamai..kbps.), nudge_y = 3, size = 2) +
    labs(y = 'Average Actual Speed (kbps)', x = 'Country') +
    coord_flip()
```

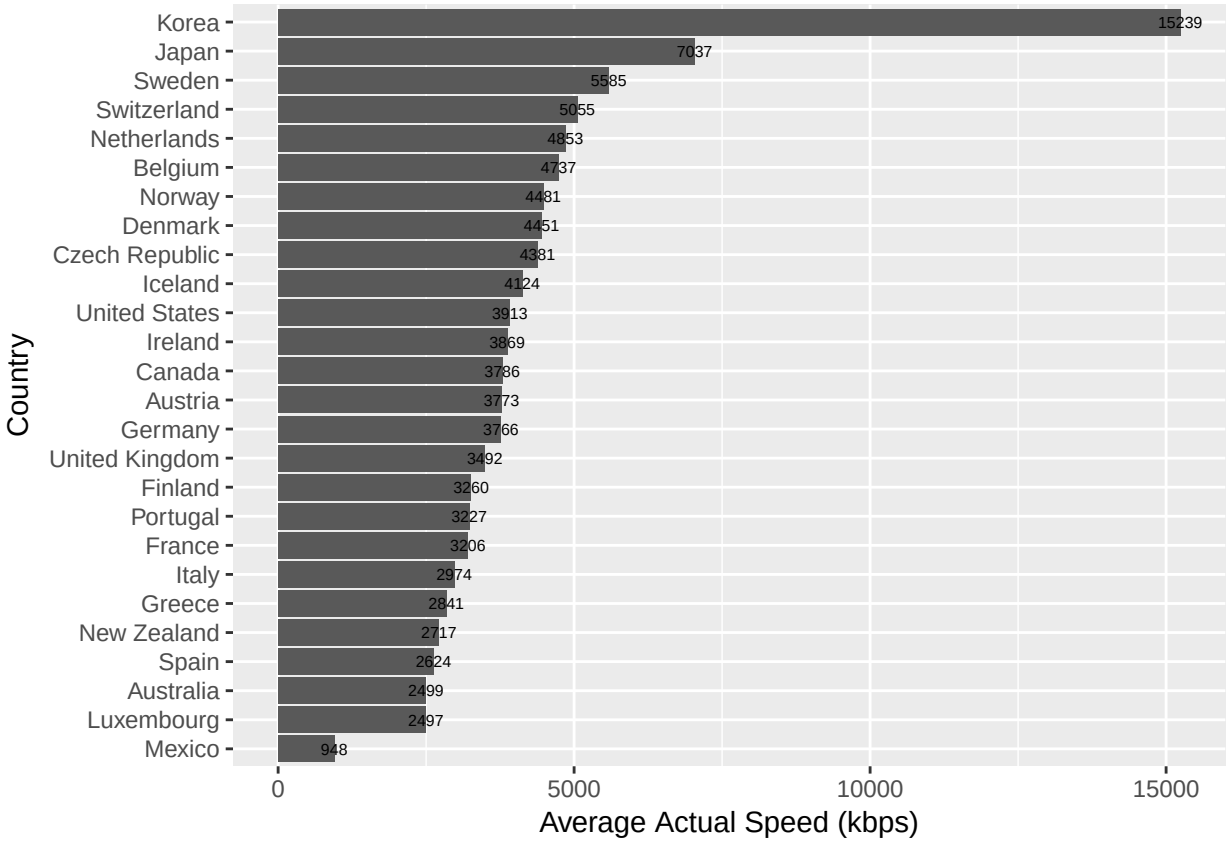
```
## Warning: Removed 4 rows containing missing values (position_stack).
```

```
## Warning: Removed 4 rows containing missing values (geom_text).
```



We immediately notice a few countries with missing data. It is worth noting that the countries with missing data (Turkey, Slovak Republic, Poland, and Hungary) were also very low in household penetration. I think that this may be an error of some sort. Let's take a look at the same plot but with some filtered rows.

```
ggplot(filter(t, !is.na(Average.actual.speed..Akamai..kbps.)),
       aes(x=reorder(Country, Average.actual.speed..Akamai..kbps.), y = Average.actual.speed..Akamai..
    geom_bar(stat='identity') +
    geom_text(aes(label=Average.actual.speed..Akamai..kbps.), nudge_y = .5, size = 2) +
    labs(y = 'Average Actual Speed (kbps)', x = 'Country') +
    coord_flip()
```



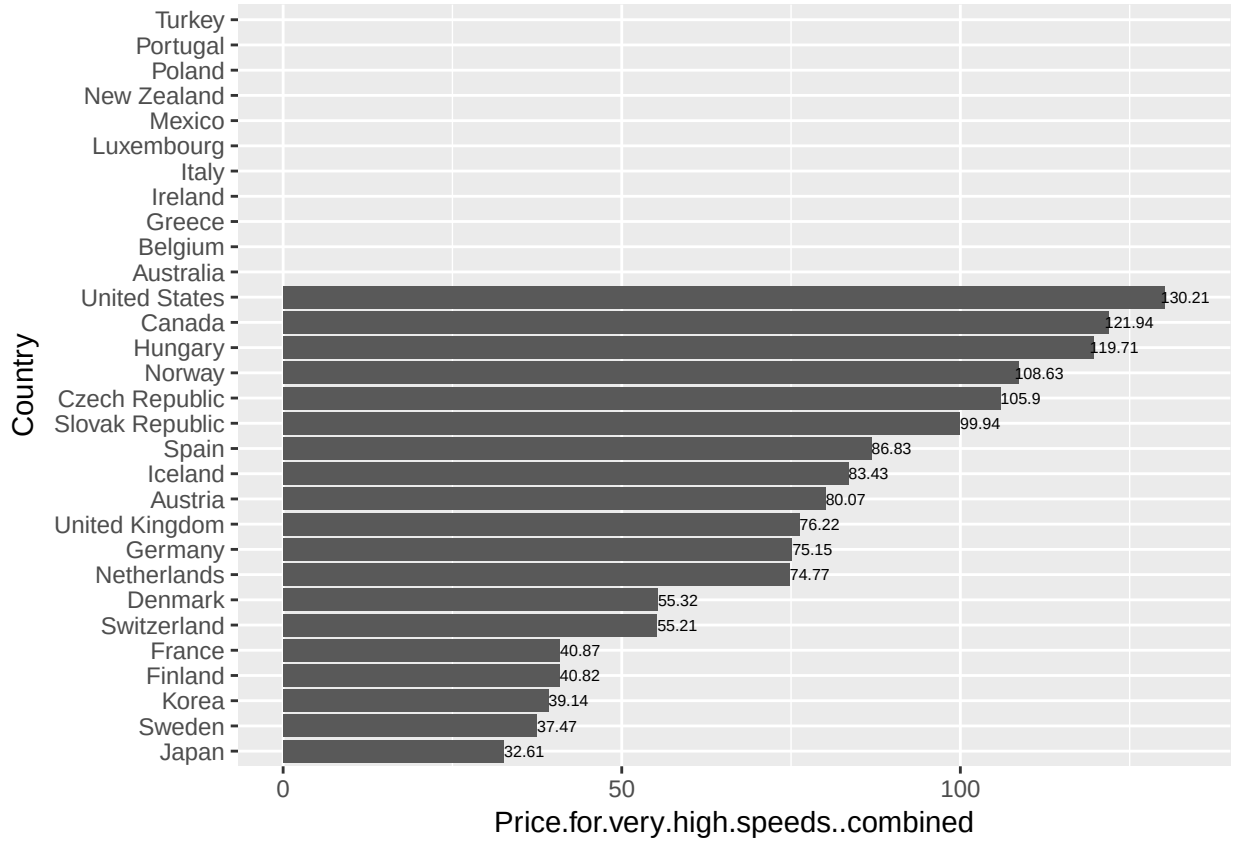
Here we see that Korea, which had the highest penetration, now has the highest speed at 15.239 kbps. United States has a medium speed at 3.913 kbps. Luxemborg has lowest speed at 2.497 kbps.

Finally, let's take a look at some prices. I'm not really sure of the currency unit, but it's all relative anyways.

```
ggplot(t, aes(x=reorder(Country, Price.for.very.high.speeds..combined), y = Price.for.very.high.speeds.
    geom_bar(stat='identity') +
    geom_text(aes(label=Price.for.very.high.speeds..combined), nudge_y = 3, size = 2) +
    labs(y = 'Price.for.very.high.speeds..combined', x = 'Country') +
    coord_flip()
```

```
## Warning: Removed 11 rows containing missing values (position_stack).
```

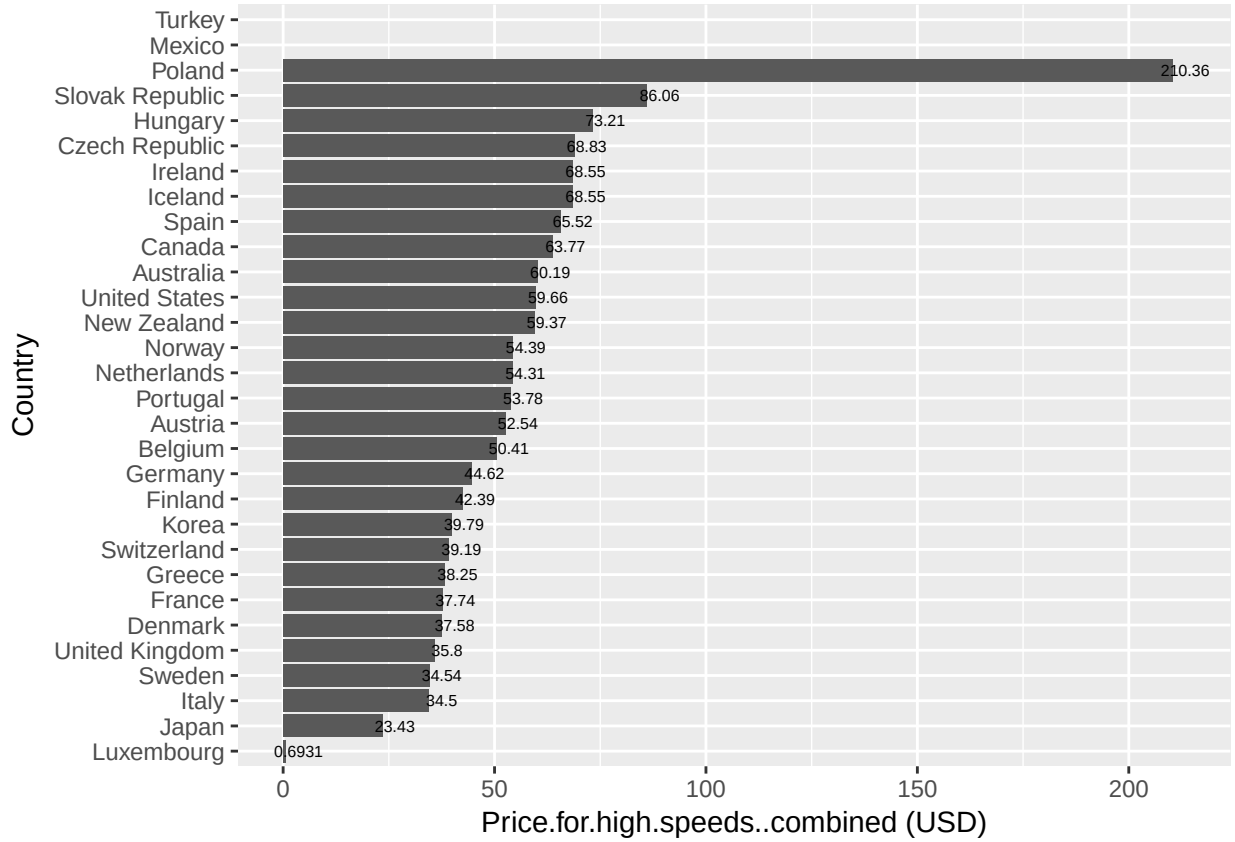
```
## Warning: Removed 11 rows containing missing values (geom_text).
```



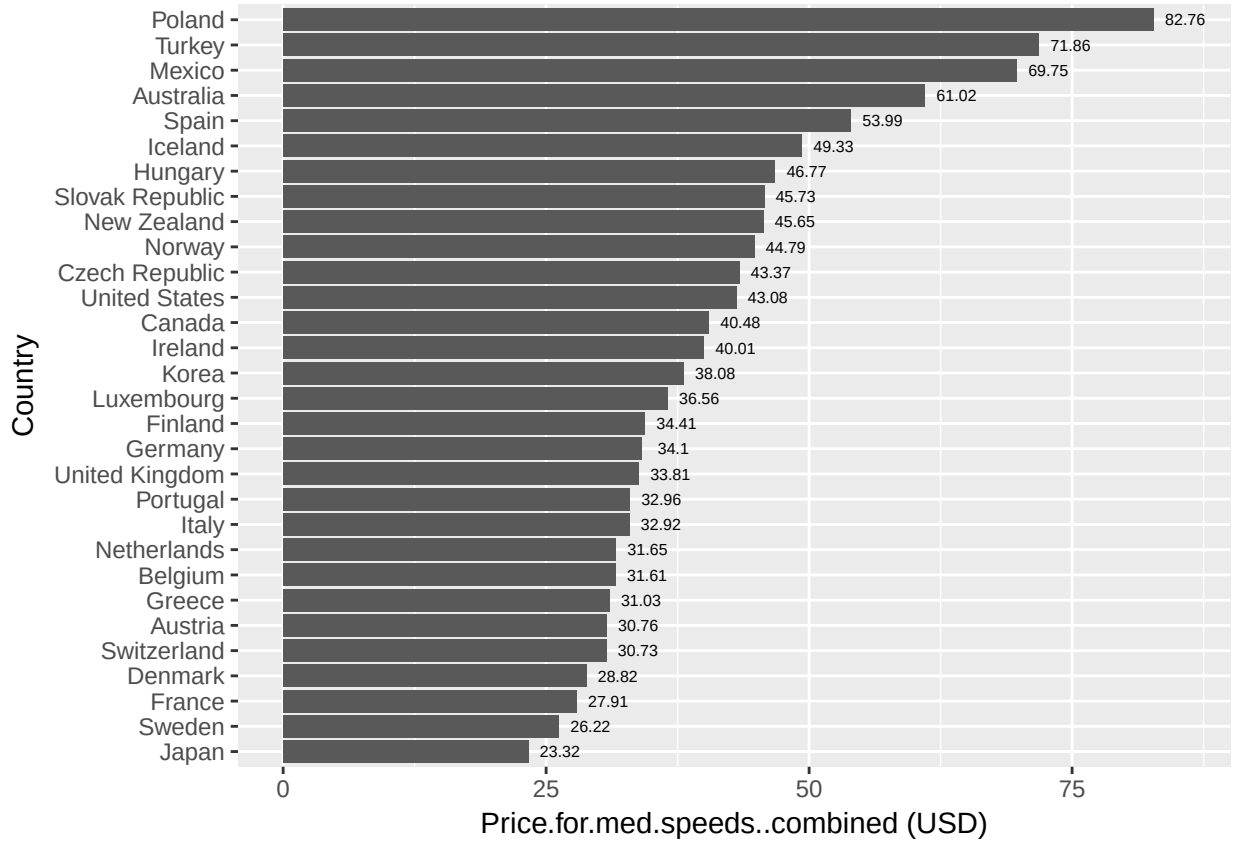

```
ggplot(t, aes(x=reorder(Country, Price.for.high.speeds..combined), y = Price.for.high.speeds..combined)
    geom_bar(stat='identity') +
    geom_text(aes(label=Price.for.high.speeds..combined), nudge_y = 3, size = 2) +
    labs(y = 'Price.for.high.speeds..combined (USD)', x = 'Country') +
    coord_flip()
```

```
## Warning: Removed 2 rows containing missing values (position_stack).
```

```
## Warning: Removed 2 rows containing missing values (geom_text).
```



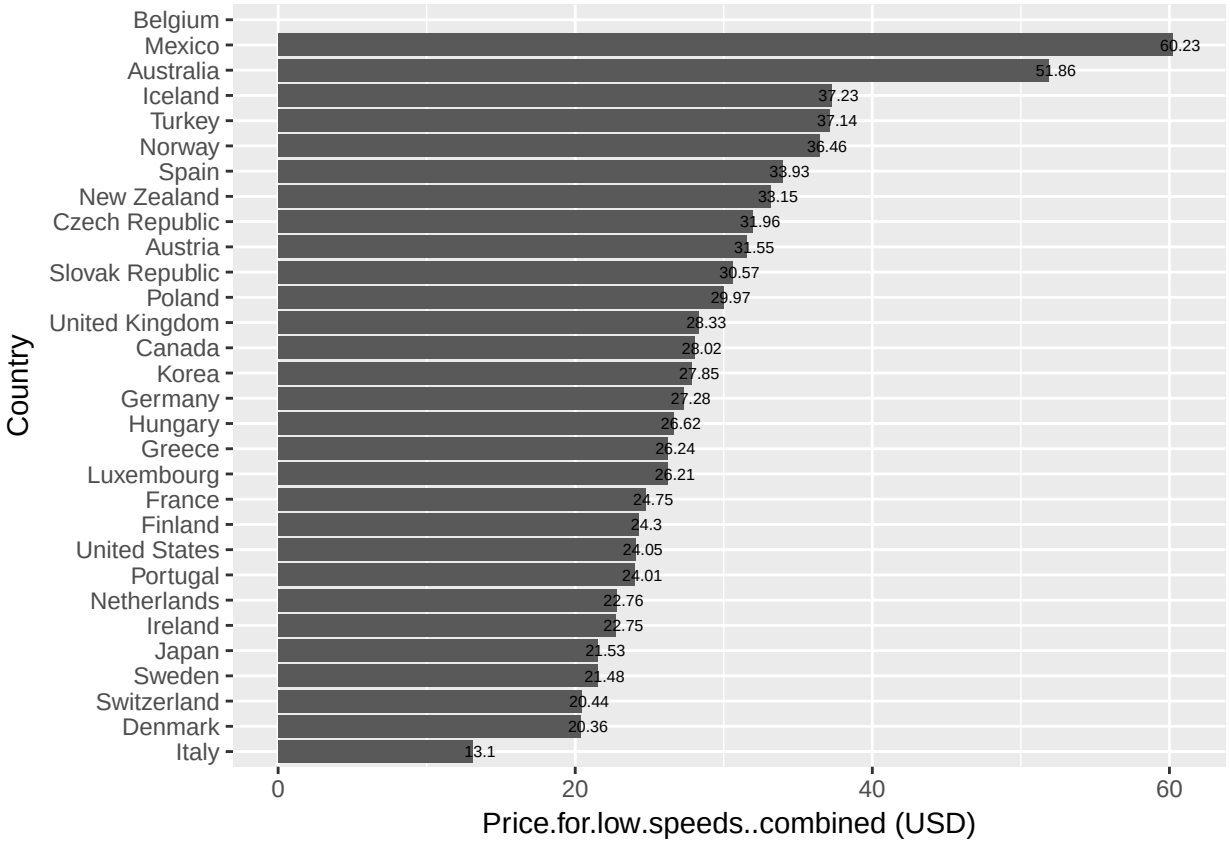

```
ggplot(t, aes(x=reorder(Country, Price.for.med.speeds..combined), y = Price.for.med.speeds..combined)) +
    geom_bar(stat='identity') +
    geom_text(aes(label=Price.for.med.speeds..combined), nudge_y = 3, size = 2) +
    labs(y = 'Price.for.med.speeds..combined (USD)', x = 'Country') +
    coord_flip()
```




```
ggplot(t, aes(x=reorder(Country, Price.for.low.speeds..combined), y = Price.for.low.speeds..combined)) +
    geom_bar(stat='identity') +
    geom_text(aes(label=Price.for.low.speeds..combined), nudge_y = .5, size = 2) +
    labs(y = 'Price.for.low.speeds..combined (USD)', x = 'Country') +
    coord_flip()
```

```
## Warning: Removed 1 rows containing missing values (position_stack).
```

```
## Warning: Removed 1 rows containing missing values (geom_text).
```

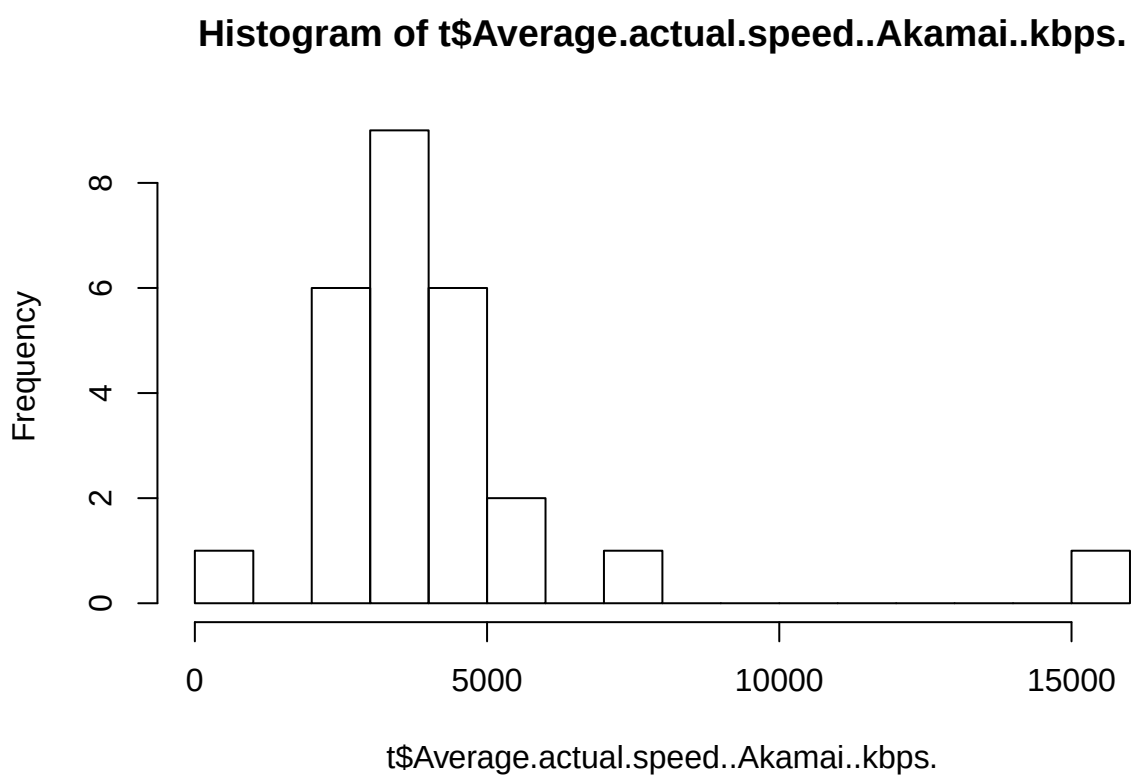


1. Average network speed

```
summary(t$Average.actual.speed..Akamai..kbps., na.rm = T)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##     948    3032    3780    4205    4474   15239       4
```

```
hist(t$Average.actual.speed..Akamai..kbps., breaks = 20)
```

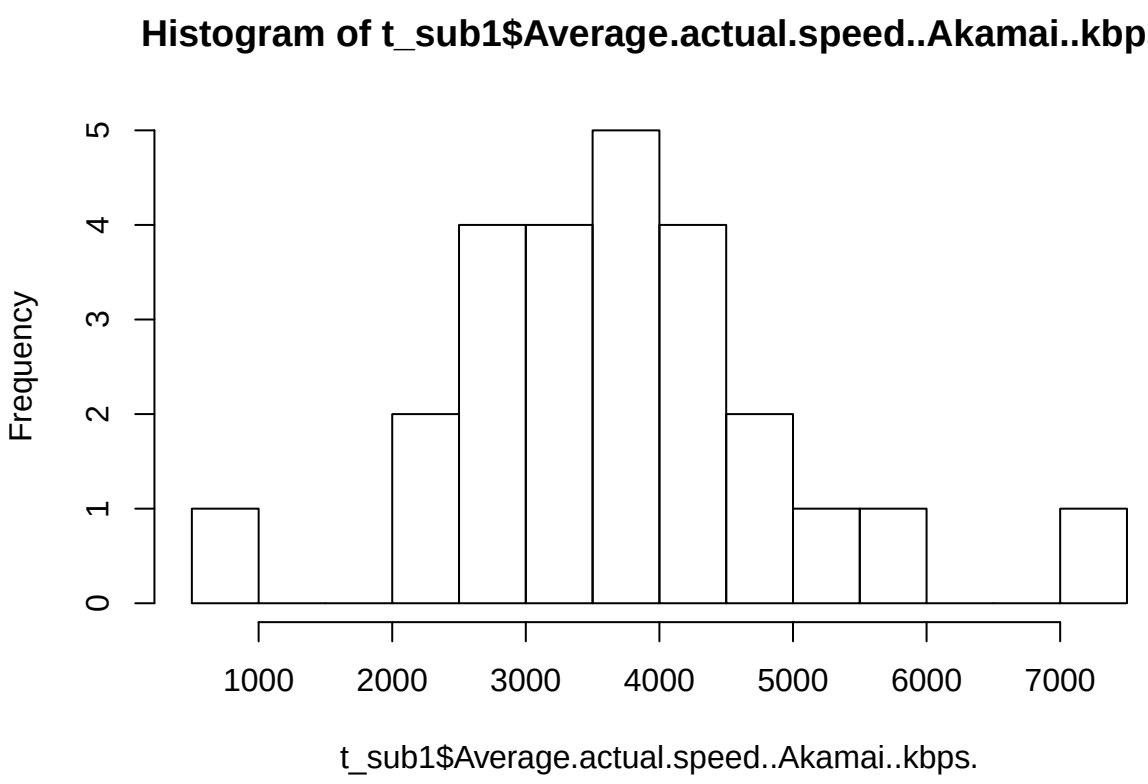


There seems to be an outlier at 948 kbps(max), which makes it difficult to examine the distribution of the values where values are clustered. Let's remove the outlier.

```
t_sub1 <- subset(t, Average.actual.speed..Akamai..kbps. < 8000, na.rm = T)
summary(t_sub1$Average.actual.speed..Akamai..kbps.)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     948    2974    3773    3764    4451    7037
```

```
hist(t_sub1$Average.actual.speed..Akamai..kbps., breaks = 20)
```

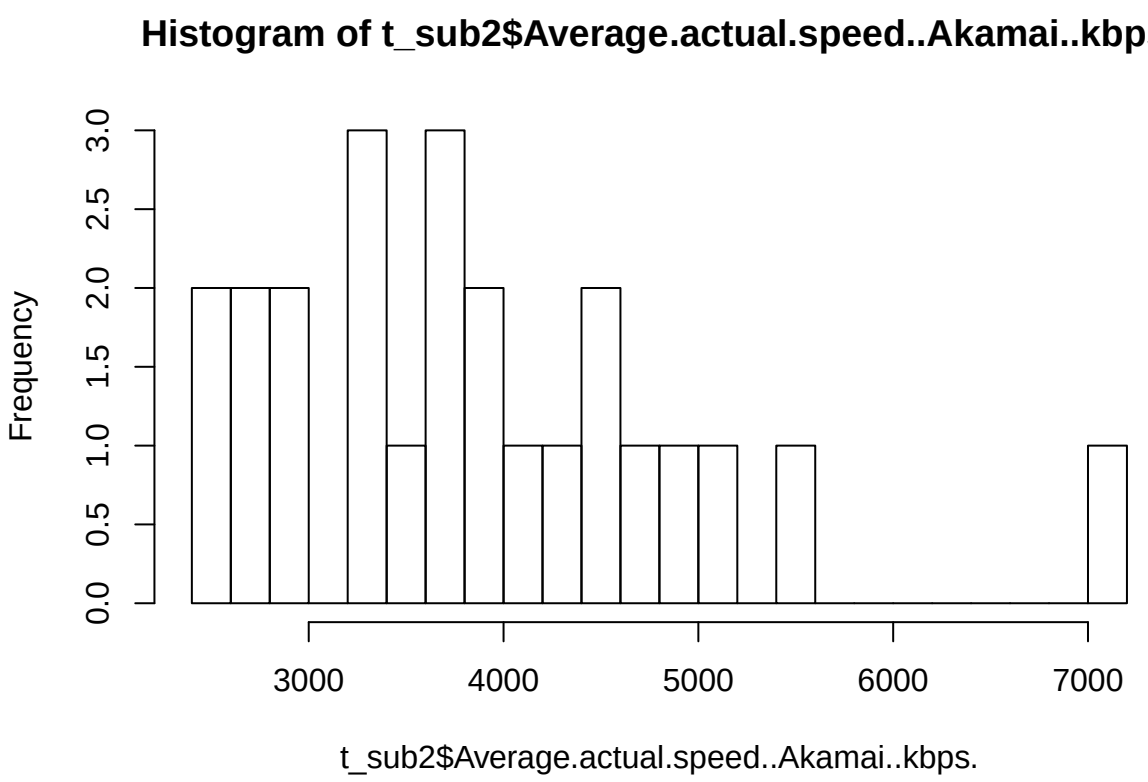


We can now notice that mean value has become close to Median, and that most countries have network speed between 2 to 5.5, with another outlier at 15. Let's remove this value.

```
t_sub2 <- subset(t_sub1, Average.actual.speed..Akamai..kbps. > 1000, na.rm = T)
summary(t_sub2$Average.actual.speed..Akamai..kbps.)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2497    3148    3780    3881    4458    7037
```

```
hist(t_sub2$Average.actual.speed..Akamai..kbps., breaks = 20)
```



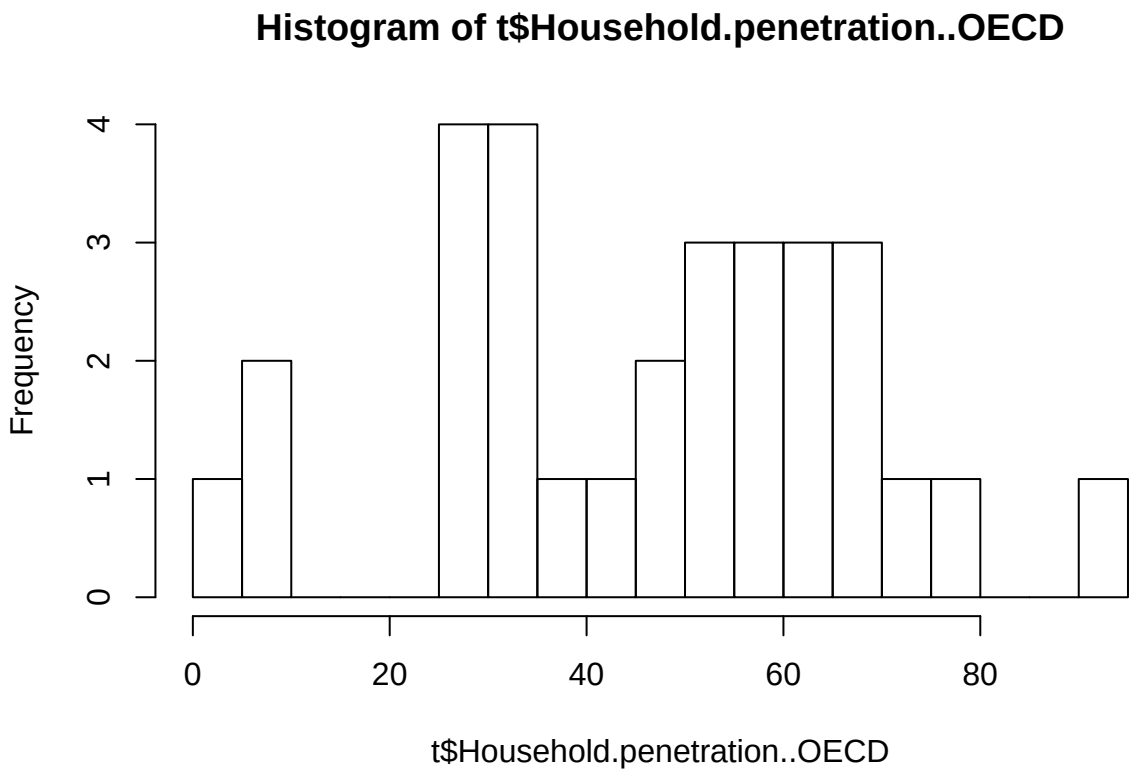
Now we can see more clearly that the actual average speed has negative skew with a mean value at 3.881.

2. Household penetration

```
summary(t$Household.penetration..OECD)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.73   30.50   50.19   46.41   62.97   94.13
```

```
hist(t$Household.penetration..OECD, breaks = 20)
```



We can clearly see that most of the countries' household penetration lies between 25% and 80% with a slight negative skew.

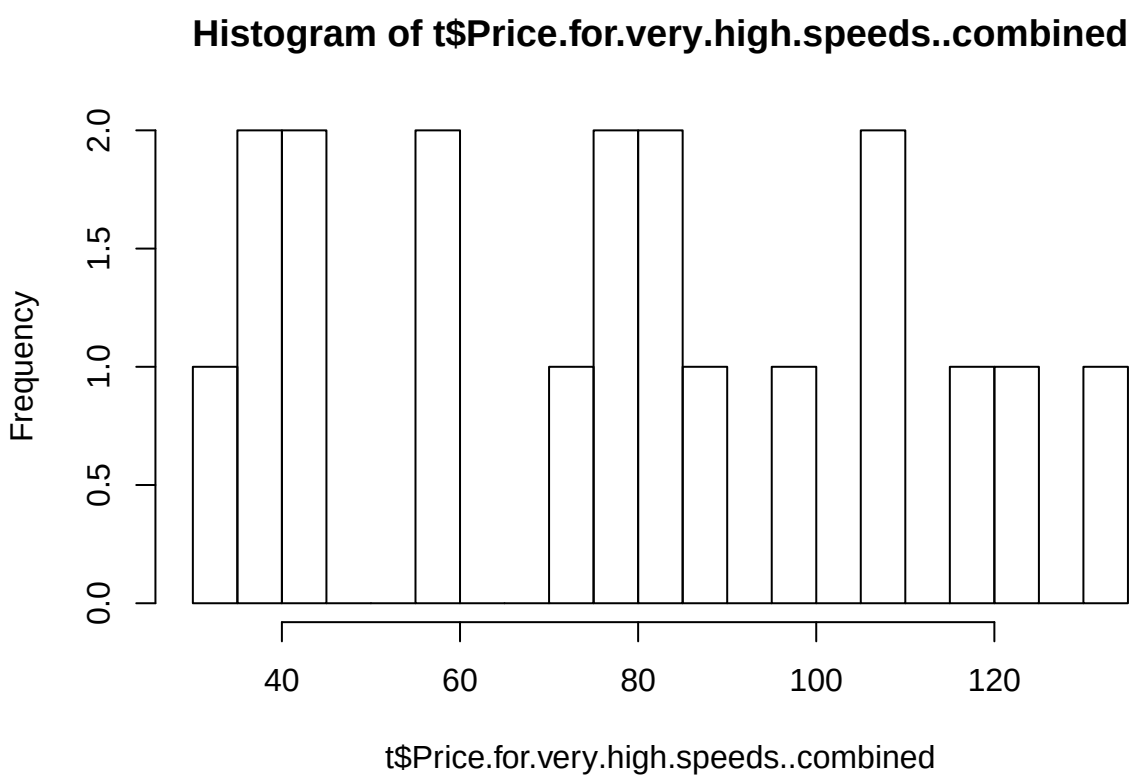
3. Price for various speeds

A.Price for very high speed network

```
summary(t$Price.for.very.high.speeds..combined, na.rm = T)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   32.61   48.04   76.22   77.07  102.92  130.21      11
```

```
hist(t$Price.for.very.high.speeds..combined, breaks = 20)
```



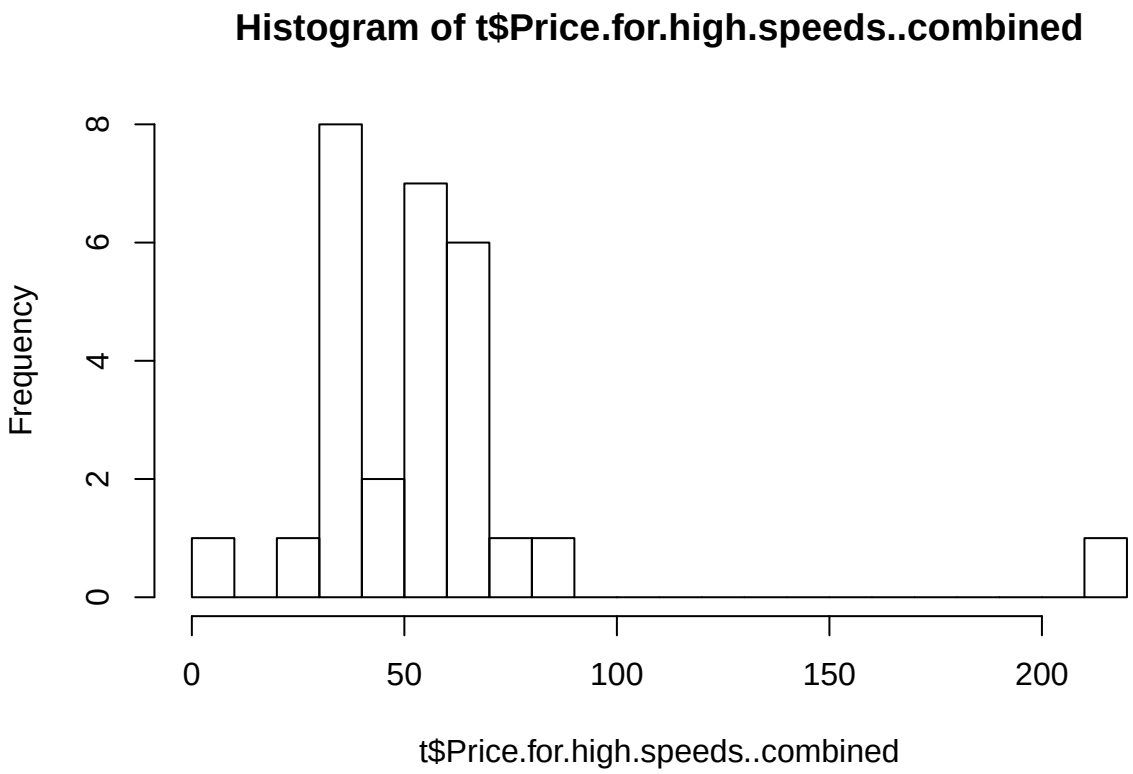
This histogram shows that price for very high speeds are everywhere, without any regular dispersion.

B.Price for high speed network

```
summary(t$Price.for.high.speeds..combined, na.rm = T)
```

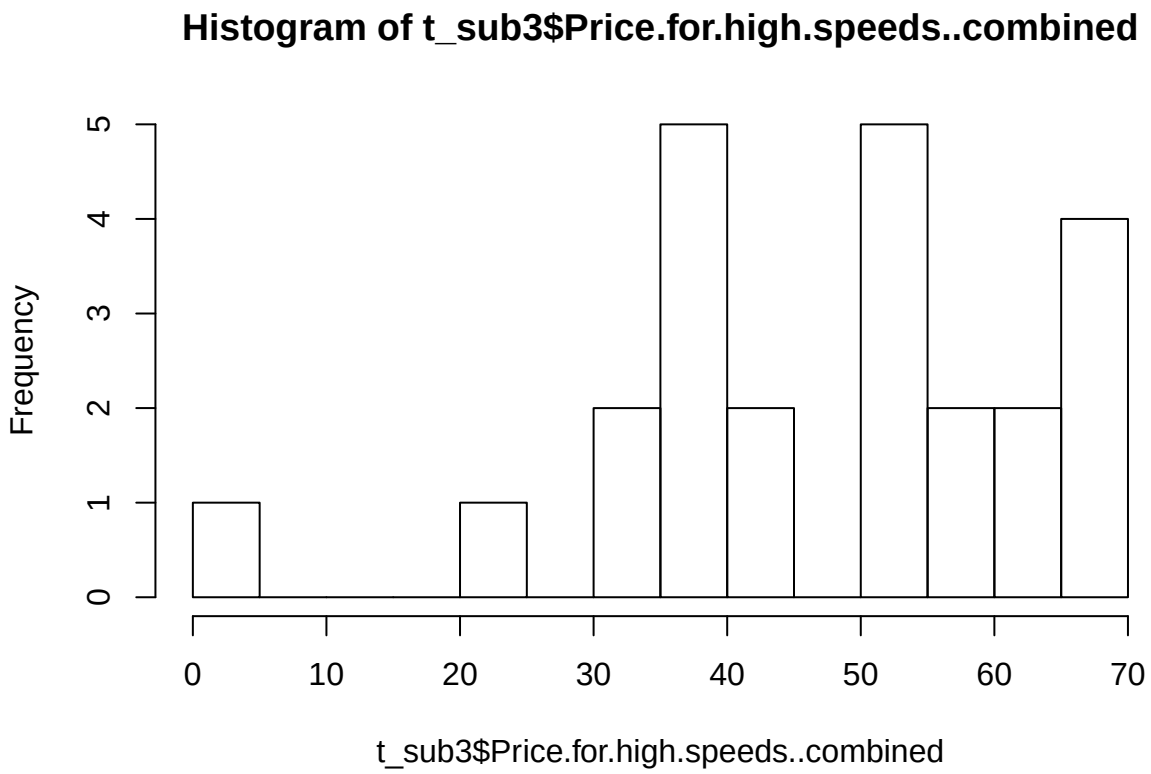
```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.     NA's
##   0.6931  38.1225  53.1600  55.6437  64.2075 210.3600        2
```

```
hist(t$Price.for.high.speeds..combined, breaks = 20)
```



We can see that the outlier above 200 makes examination of distribution difficult.

```
t_sub3 <- subset(t_sub2, Price.for.high.speeds..combined < 200, na.rm = T)
hist(t_sub3$Price.for.high.speeds..combined, breaks = 20)
```



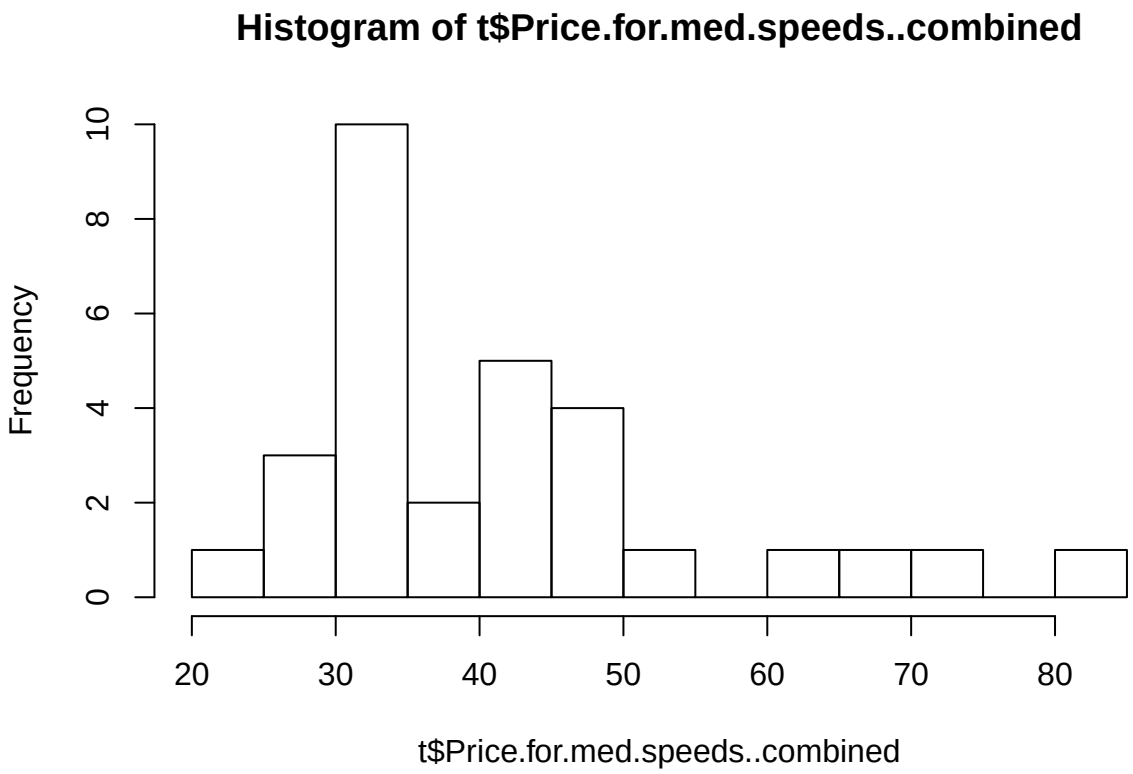
From this revised subset, we can see that most countries charge 30 to 70 dollars for high speed internet varying diversely.

C.Price for Med speed network

```
summary(t$Price.for.med.speeds..combined)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   23.32   31.62   37.32   41.45   45.71   82.76
```

```
hist(t$Price.for.med.speeds..combined, breaks = 20)
```



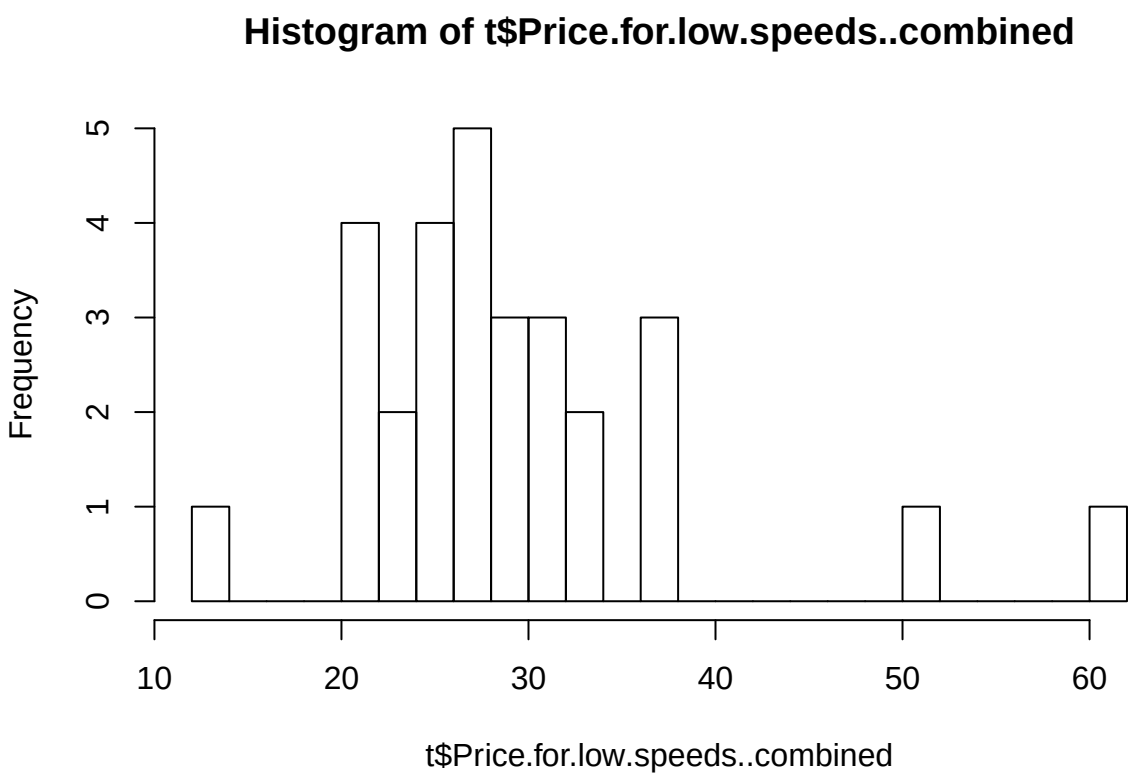
Compared to high speed networks, medium speed network shows more clustered around 30-50 dollars.

D.Price for Low speed network

```
summary(t$Price.for.low.speeds..combined)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   13.10   24.01   27.28   29.11   31.96   60.23       1
```

```
hist(t$Price.for.low.speeds..combined, breaks = 20)
```



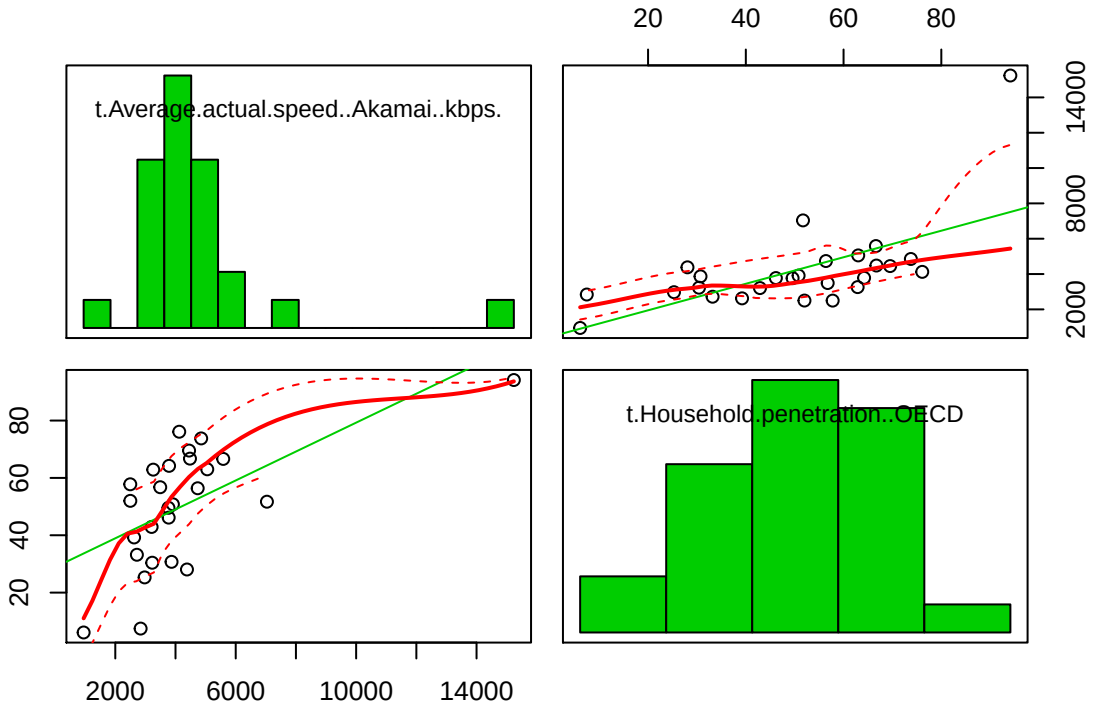
Low price network also has similarly shaped histogram to medium speed network, compared to high speed network.

Analysis of Key Relationships

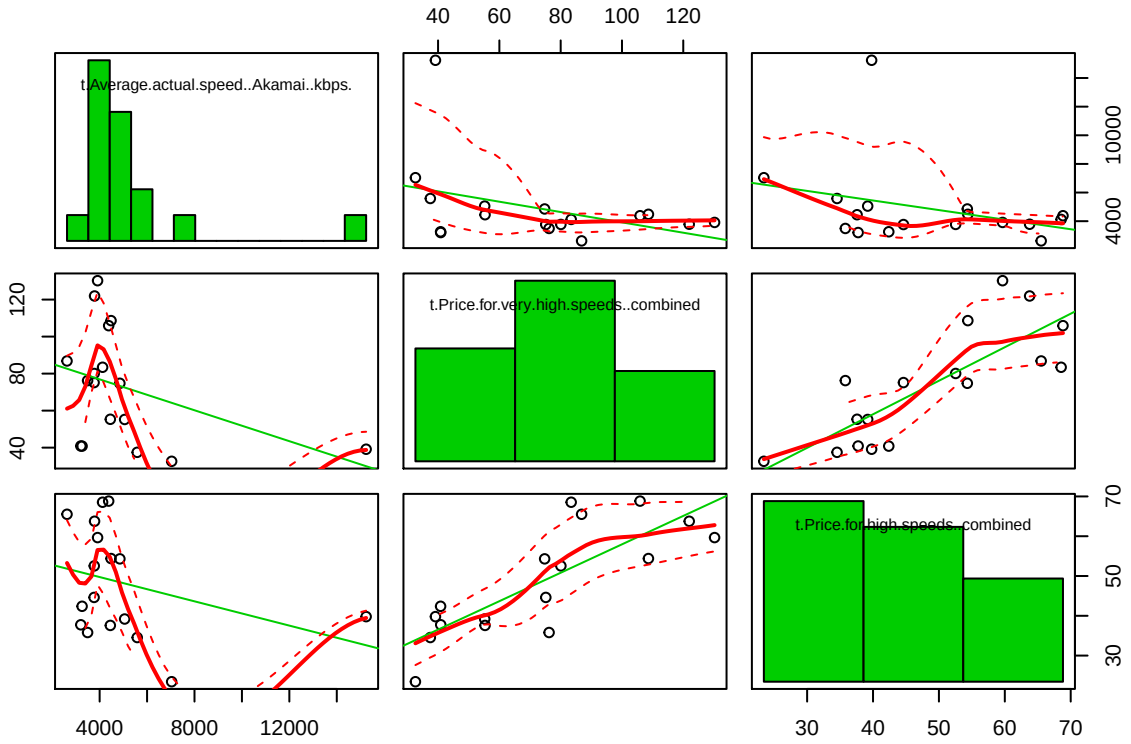
Scatterplot Matrix

To test relationsihps among the key variables, we first draw the scatterplot matrix.

```
scatterplotMatrix( ~t$Average.actual.speed..Akamai..kbps. + t$Household.penetration..OECD, diagonal = '
```

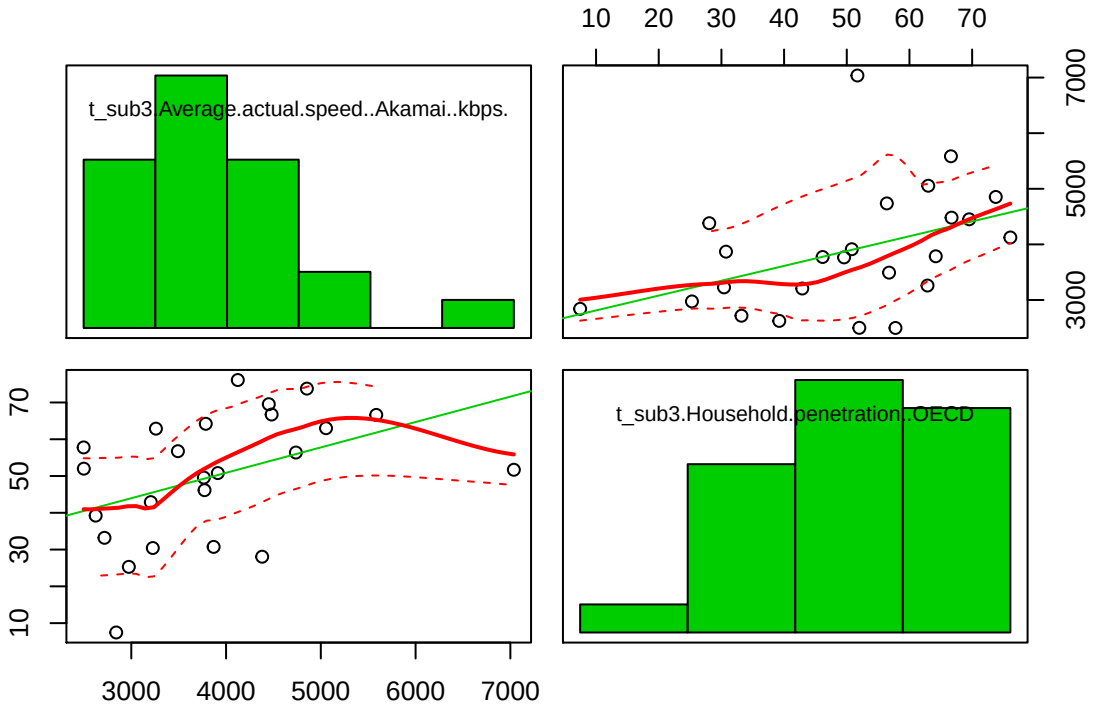



```
scatterplotMatrix( ~t$Average.actual.speed..Akamai..kbps. + t$Price.for.very.high.speeds..combined + t$
```

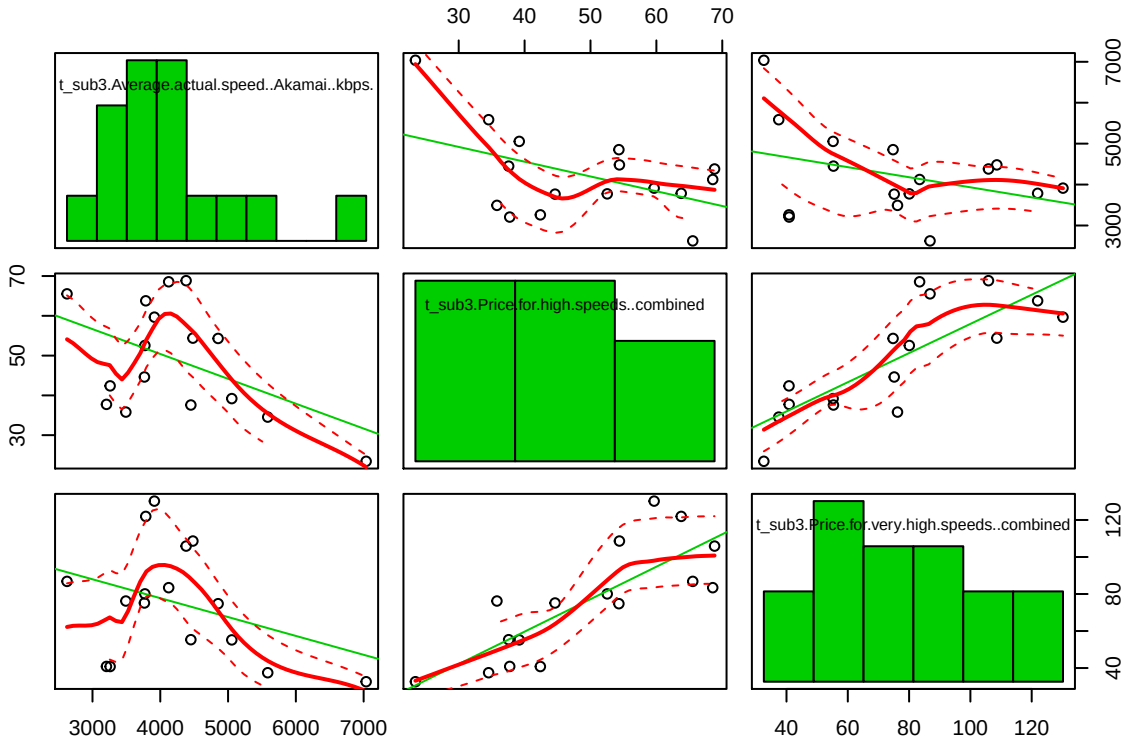


We can see some slight negative relationship between penetration and speed, but it is biased because of some outliers. Relationship between price and speed also seems affected by the outlier. Let's draw scatterplot matrix for Speed, Penetration, and Price, for different prices for High, Med, and Low speed network.

```
#scatterplotMatrix( ~t_sub3$Average.actual.speed..Akamai..kbps. + t_sub3$Household.penetration..OECD +
scatterplotMatrix( ~t_sub3$Average.actual.speed..Akamai..kbps. + t_sub3$Household.penetration..OECD, di
```




```
scatterplotMatrix( ~t_sub3$Average.actual.speed..Akamai..kbps. + t_sub3$Price.for.high.speeds..combined
```



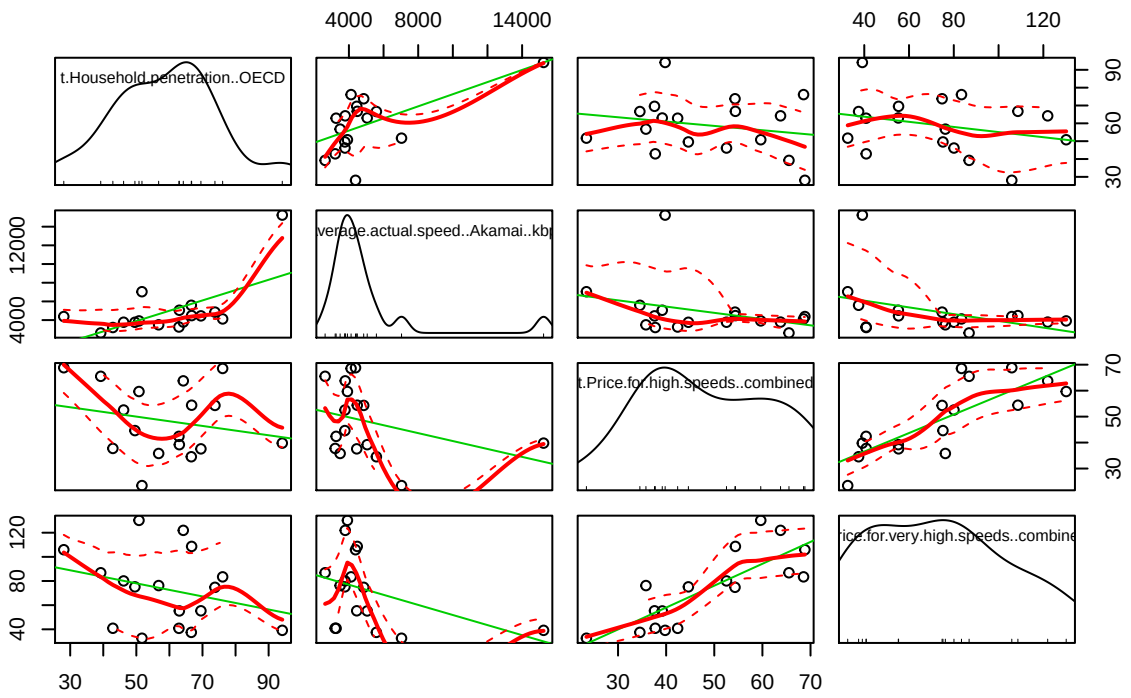
We can clearly see: 1) Positive relationship between Speed and Penetration; and 2) Negative relationships between Speed and Prices, more so with Price for med and low speed networks than Price for high speed networks. The reason why there is weaker relationship between Speed and price for high/veryhigh than Speed and price for low/med is because prices for high/veryhigh network are dispersed more broadly than low/med network. This is completely the opposite to the argument of the network owners.

Exploratory Data Analysis

Create the scatterplot matrix to investigate the relationships between variables. We focus on the Household Penetration Rate, Average Actual Speed, and the Price for high, medium, and low speed.

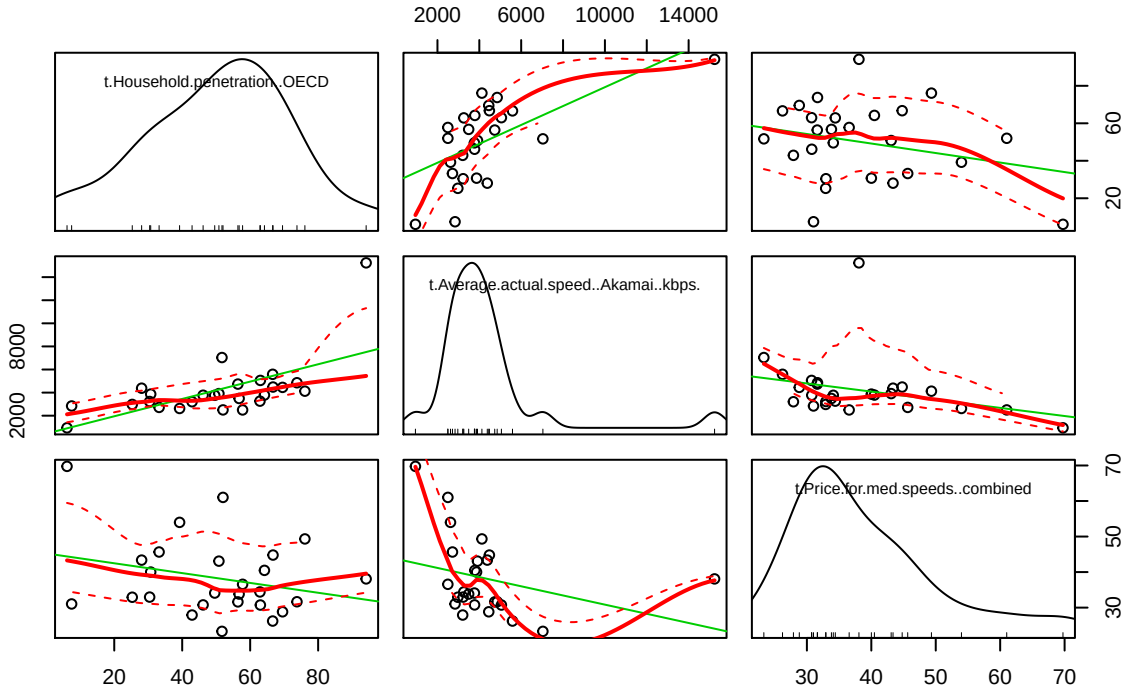
```
library(car)

scatterplotMatrix( ~ t$Household.penetration..OECD  + t$Average.actual.speed..Akamai..kbps. + t$Price.f
                   data = t,
                   main = "Scatterplot Matrix for Penetration, Actual Speed, and Price for Very High an
```

ot Matrix for Penetration, Actual Speed, and Price for Very High and Hig



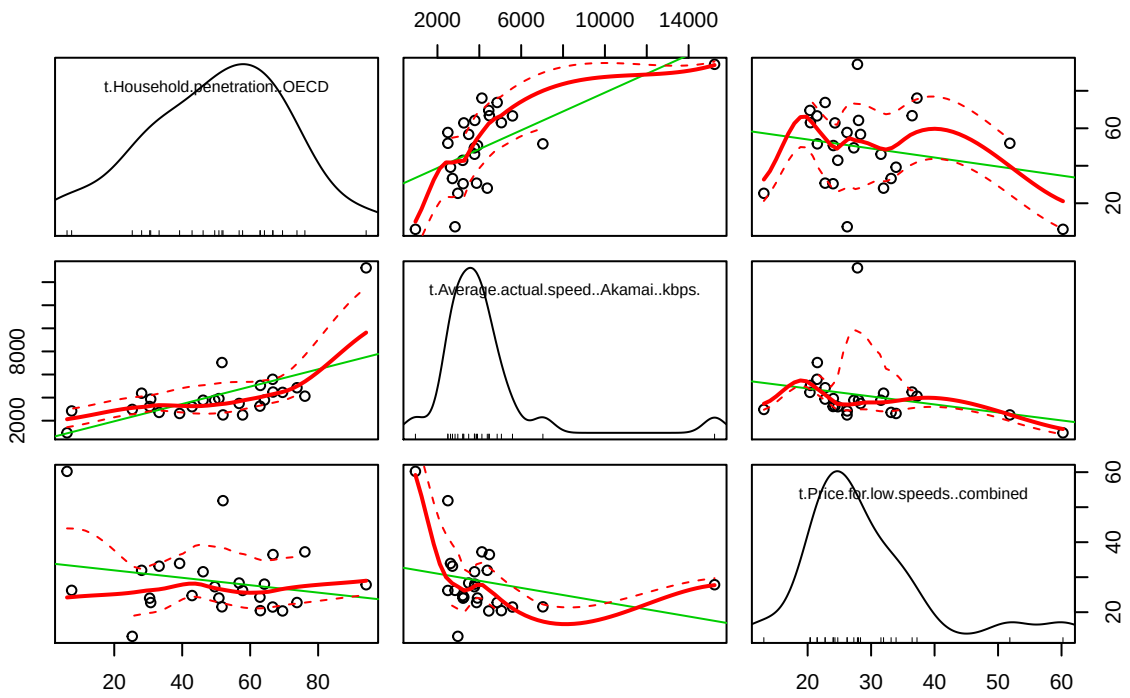

```
scatterplotMatrix( ~ t$Household.penetration..OECD  + t$Average.actual.speed..Akamai..kbps. + t$Price.fo
                   data = t,
                   main = "Scatterplot Matrix for Penetration, Actual Speed, and Price for Medium Speed
```

ıtterplot Matrix for Penetration, Actual Speed, and Price for Medium Sp




```
scatterplotMatrix( ~ t$Household.penetration..OECD+ t$Average.actual.speed..Akamai..kbps. + t$Price.for
                   data = t,
                   main = "Scatterplot Matrix for Penetration, Actual Speed, and Price for Low Speed")
```

catterplot Matrix for Penetration, Actual Speed, and Price for Low Spee



From the scatter plot matrix we discovered: 1. There is a positive relationship between the household penetration rate and the actual speed, only when the consumers are paying for high or very high speed. 2. House penetration rate and the medium and low price displayed negative relationship. The result suggested that the lower the price consumer paid, the less house penetration rate the signal is.

Get the descriptive statistics of the variables

```
summary(t$Household.penetration..OECD)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.73   30.50   50.19   46.41   62.97   94.13
```

```
summary(t$Average.actual.speed..Akamai..kbps.)
```

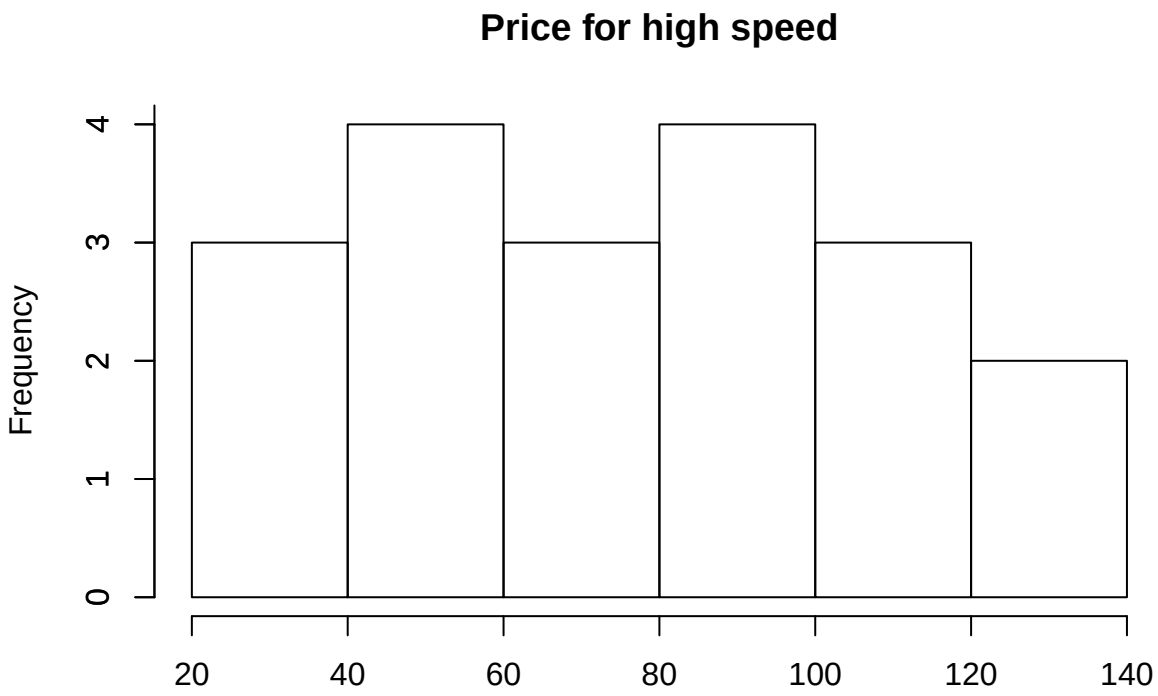
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##     948    3032    3780    4205    4474   15239       4
```

```
summary(t$Price.for.very.high.speeds..combined)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   32.61   48.04   76.22   77.07  102.92  130.21      11
```

Create the histogram for very high speed price

```
hist(t$Price.for.very.high.speeds..combined, main = "Price for high speed",
     xlab = NULL)
axis(2, at = 0:135)
```



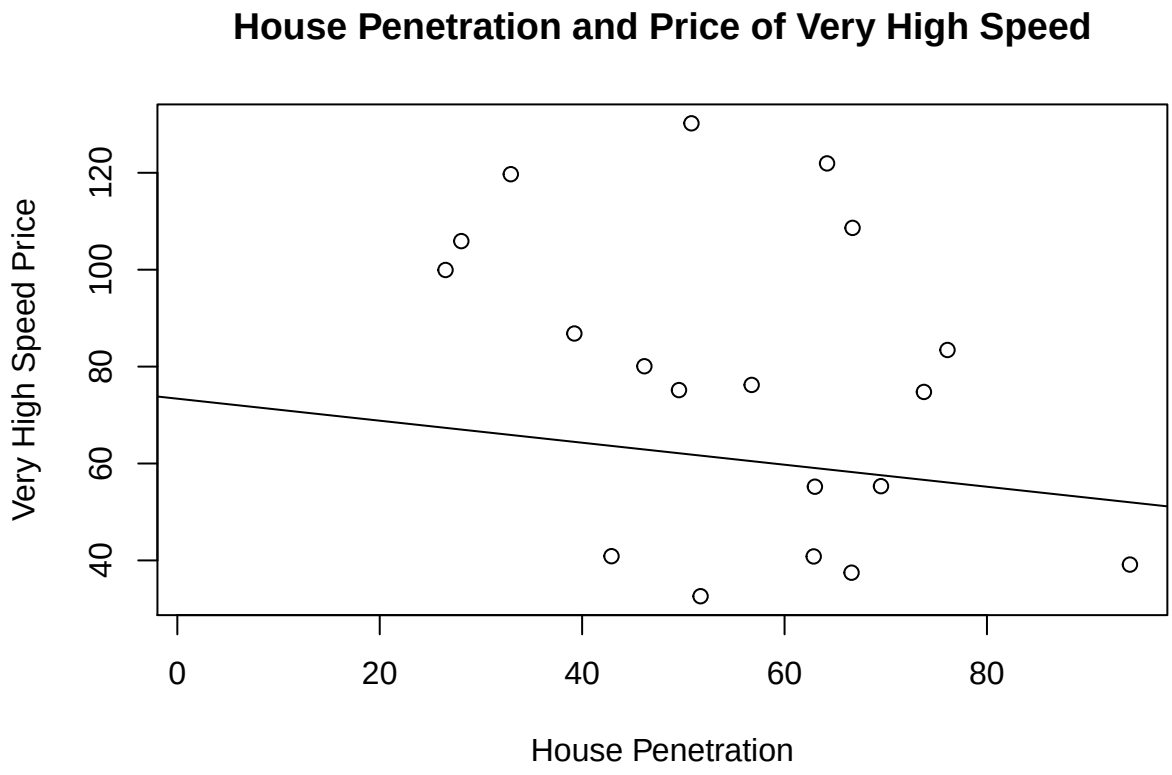
Create the regression line to see the relationship.

```
plot(t$Household.penetration..OECD, factor = 2, t$Price.for.very.high.speeds..combined, factor = 2,
     xlab = "House Penetration", ylab = "Very High Speed Price",
     main = "House Penetration and Price of Very High Speed")
```

```
## Warning in plot.window(...): "factor" is not a graphical parameter

## Warning in plot.window(...): "factor" is not a graphical parameter

## Warning in plot.xy(xy, type, ...): "factor" is not a graphical parameter

## Warning in plot.xy(xy, type, ...): "factor" is not a graphical parameter

## Warning in axis(side = side, at = at, labels = labels, ...): "factor" is
## not a graphical parameter

## Warning in axis(side = side, at = at, labels = labels, ...): "factor" is
## not a graphical parameter

## Warning in axis(side = side, at = at, labels = labels, ...): "factor" is
## not a graphical parameter

## Warning in axis(side = side, at = at, labels = labels, ...): "factor" is
## not a graphical parameter

## Warning in box(...): "factor" is not a graphical parameter
```

```
## Warning in box(...): "factor" is not a graphical parameter
## Warning in title(...): "factor" is not a graphical parameter
## Warning in title(...): "factor" is not a graphical parameter
```

```
abline(lm(t$Household.penetration..OECD ~ t$Price.for.very.high.speeds..combined))
```




```
summary(t$Price.for.high.speeds..combined)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.     NA's
##   0.6931  38.1225  53.1600  55.6437  64.2075 210.3600        2
```

```
summary(t$Price.for.med.speeds..combined)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   23.32   31.62   37.32   41.45   45.71   82.76
```

```
summary(t$Price.for.low.speeds..combined)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   13.10   24.01   27.28   29.11   31.96   60.23       1
```