Gap Minder - Problem Set 1 Lesson 4, #15

Execute with *Run* button within the chunk or by placing your cursor inside it and pressing *Cmd+Shift+Enter*. Add new chunk with *Insert Chunk* button on toolbar or *Cmd+Option+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Cmd+Shift+K* to preview the HTML file).

The Gapminder website

contains over 500 data sets with information about the world's population. Your task is to download a data set of your choice and *create 2-5 plots* that make use of the techniques from Lesson 3. *You might use:* - a simple histogram, - a boxplot split over a categorical variable, - or a frequency polygon The choice is yours! *Once you've completed your investigation, create a post in the discussions that includes:* 1. any questions you answered, your observations, and summary statistics 2. snippets of code that created the plots 3. links to the images of your plots

Save images by using the ggsave() command.

ggsave() will save the last plot created. For example... # qplot(x = price, data = diamonds) # ggsave('priceHistogram.png')

ggsave currently recognises the extensions eps/ps, tex (pictex), pdf, jpeg, tiff, png, bmp, svg and wmf (windows only).

read.csv()

The following command may be helpful for some of the Gapminder Data sets, once it's been converted to csv format: `read.csv('data.csv', header = T, row.names = 1, check.names = F)`. You may want to look at additional function arguments in the help file for the `read.table()` family for additional tools that can help you read in data.

To exchange the rows and columns of dataframe,

use the transpose function, `t()`.

Copy and paste all of the code that you used for your investigation, and submit it when you are ready.

```
#READ IN csv
unemployed <- read.csv('f 25-54 unemploy.csv', header=TRUE)
#ingore last row 30 and column (27) with NA values
unplyd <- unemployed[1:29,1:26]
names(unplyd)<- gsub('X', "", names(unplyd))
colnames(unplyd)[1] = "country"
```

```
library(tidyr)
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(ggplot2)
library(gridExtra)
```

```
##
## Attaching package: 'gridExtra'
```

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

collapse multiple columns with gather

```
#gather with year key, ignore NA
unplyd_year <- gather(unplyd, year, unemployed, 2:26,
                      na.rm = TRUE)
head(unplyd_year,5)
```

```
##    country year unemployed
## 2   Canada 1981        7.1
## 5  Finland 1981        3.4
## 6   France 1981        7.5
## 10   Japan 1981        2.0
## 16  Norway 1981        2.3
```

```
str(unplyd_year)
```

```
## 'data.frame':    518 obs. of  3 variables:
##  $ country   : Factor w/ 30 levels "","Australia",..: 3 6 7 11 17 22 25 26 30 3 ...
##  $ year      : chr  "1981" "1981" "1981" "1981" ...
##  $ unemployed: num  7.1 3.4 7.5 2 2.3 ...
```

Data Transformation with dplyr

filter for unemployment > 20% arrange from largest to smallest (descending) unemployment arrange from most recent to oldest year (descending)

```
big_u <- filter(unplyd_year, unemployed >20)
big_u
```

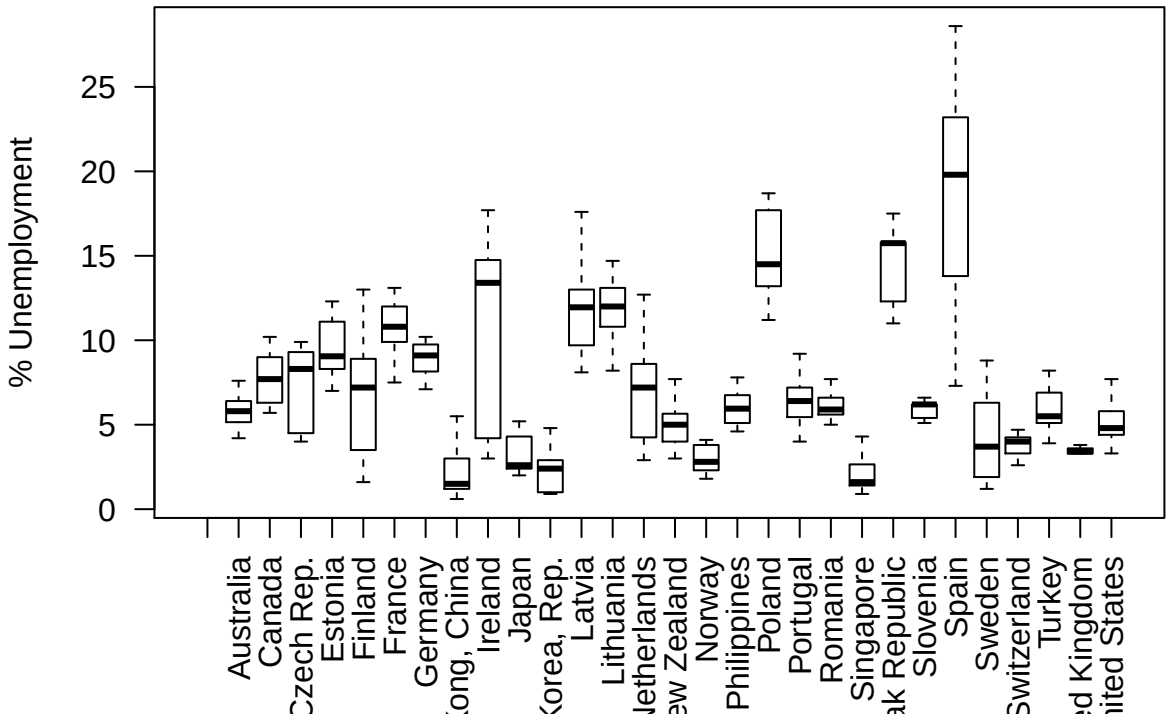
```
##    country year unemployed
## 1    Spain 1988       21.4
## 2    Spain 1989       21.0
## 3    Spain 1990       20.4
## 4    Spain 1991       20.8
## 5    Spain 1992       23.2
## 6    Spain 1993       26.5
## 7    Spain 1994       28.6
```

```
## 8    Spain 1995       27.8
## 9    Spain 1996       26.5
## 10   Spain 1997       25.5
## 11   Spain 1998       24.3
## 12   Spain 1999       21.1
```

```
arrange(big_u, desc(unemployed))
```

```
##    country year unemployed
## 1    Spain 1994       28.6
## 2    Spain 1995       27.8
## 3    Spain 1993       26.5
## 4    Spain 1996       26.5
## 5    Spain 1997       25.5
## 6    Spain 1998       24.3
## 7    Spain 1992       23.2
## 8    Spain 1988       21.4
## 9    Spain 1999       21.1
## 10   Spain 1989       21.0
## 11   Spain 1991       20.8
## 12   Spain 1990       20.4
```

```
boxplot(unplyd_year$unemployed~unplyd_year$country,
        ylab = '% Unemployment', las=2)
```



###Group/Order countries by median unemployment

```
bymedian <- with(unplyd_year,reorder(unplyd_year$country,unplyd_year$unemployed,median))
bymedian
```

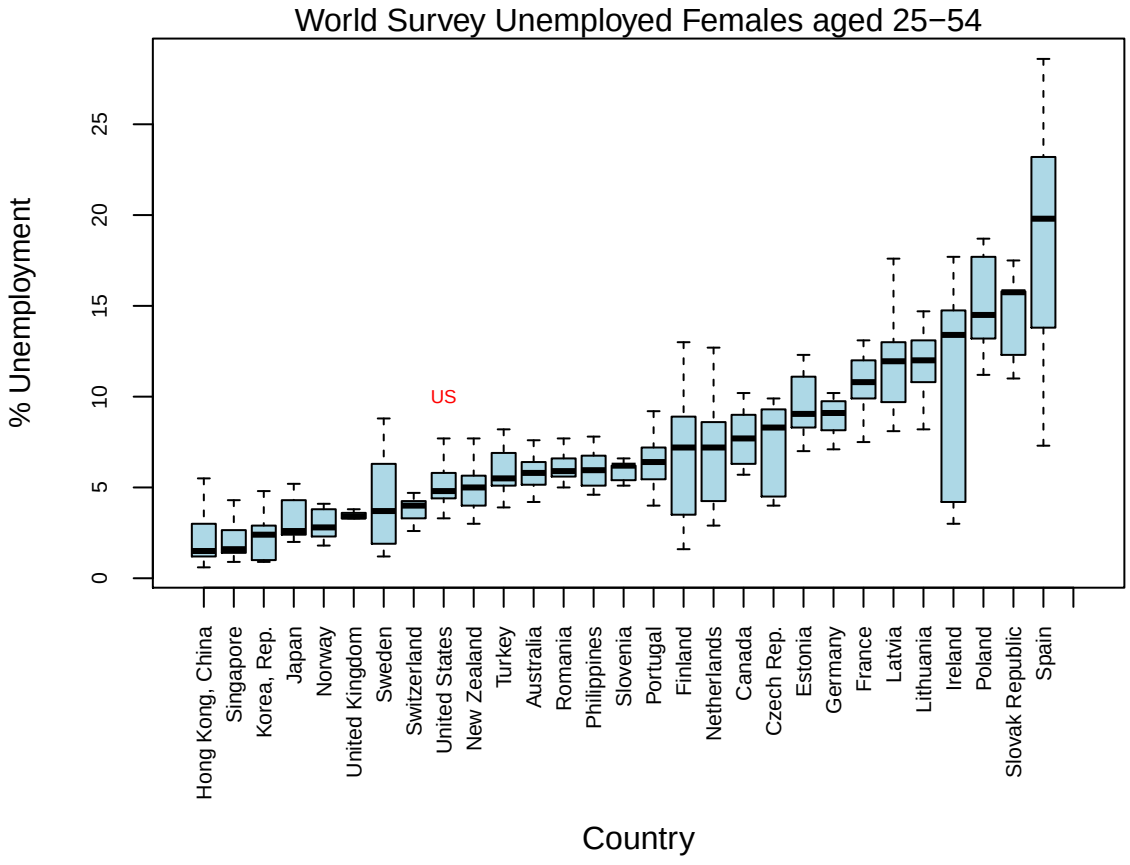
```
##   [1] Canada          Finland         France          Japan
##   [5] Norway          Singapore       Spain           Sweden
##   [9] United States   Canada          Finland         France
##  [13] Japan           Norway          Singapore       Spain
```

```
##  [17] Sweden           United States    Canada           Finland
##  [21] France           Ireland          Japan            Norway
##  [25] Portugal         Singapore        Spain            Sweden
##  [29] United States    Canada           Finland          France
##  [33] Ireland          Japan            Norway           Portugal
##  [37] Singapore        Spain            Sweden           United States
##  [41] Canada           Finland          France           Hong Kong, China
##  [45] Ireland          Japan            Norway           Portugal
##  [49] Singapore        Spain            Sweden           United States
##  [53] Australia        Canada           Finland          France
##  [57] Hong Kong, China Ireland          Japan            New Zealand
##  [61] Norway           Philippines      Portugal         Singapore
##  [65] Spain            Sweden           United States    Australia
##  [69] Canada           Finland          France           Hong Kong, China
##  [73] Ireland          Japan            Netherlands      New Zealand
##  [77] Norway           Philippines      Portugal         Singapore
##  [81] Spain            Sweden           United States    Australia
##  [85] Canada           Finland          France           Hong Kong, China
##  [89] Ireland          Japan            Netherlands      New Zealand
##  [93] Norway           Philippines      Portugal         Singapore
##  [97] Spain            Sweden           United States    Australia
## [101] Canada           Finland          France           Hong Kong, China
## [105] Ireland          Japan            Netherlands      New Zealand
## [109] Norway           Philippines      Portugal         Singapore
## [113] Spain            Sweden           Turkey           United States
## [117] Australia        Canada           Finland          France
## [121] Hong Kong, China Ireland          Japan            Netherlands
## [125] New Zealand      Norway           Philippines      Portugal
## [129] Singapore        Spain            Sweden           Turkey
## [133] United States    Australia        Canada           Finland
## [137] France           Germany          Hong Kong, China Ireland
## [141] Japan            Netherlands      New Zealand      Norway
## [145] Philippines      Portugal         Singapore        Spain
## [149] Sweden           Switzerland      Turkey           United States
## [153] Australia        Canada           Finland          France
## [157] Germany          Hong Kong, China Ireland          Japan
## [161] Korea, Rep.      Netherlands      New Zealand      Norway
## [165] Philippines      Portugal         Singapore        Spain
## [169] Sweden           Switzerland      Turkey           United States
## [173] Australia        Canada           Czech Rep.       Finland
## [177] France           Germany          Hong Kong, China Ireland
## [181] Japan            Korea, Rep.      Netherlands      New Zealand
## [185] Norway           Philippines      Poland           Portugal
## [189] Singapore        Slovenia         Spain            Sweden
## [193] Switzerland      Turkey           United States    Australia
## [197] Canada           Czech Rep.       Finland          France
## [201] Germany          Hong Kong, China Ireland          Japan
## [205] Korea, Rep.      Netherlands      New Zealand      Norway
## [209] Philippines      Poland           Portugal         Romania
## [213] Singapore        Slovenia         Spain            Sweden
## [217] Switzerland      Turkey           United States    Australia
## [221] Canada           Czech Rep.       Finland          France
## [225] Germany          Hong Kong, China Ireland          Japan
## [229] Korea, Rep.      Netherlands      New Zealand      Norway
```

```
## [233] Philippines      Poland           Portugal         Romania
## [237] Singapore        Slovenia         Spain            Sweden
## [241] Switzerland      Turkey           United States    Australia
## [245] Canada           Czech Rep.       Finland          France
## [249] Germany          Hong Kong, China Ireland          Japan
## [253] Korea, Rep.      Latvia           Netherlands      New Zealand
## [257] Norway           Philippines      Poland           Portugal
## [261] Romania          Singapore        Slovenia         Spain
## [265] Sweden           Switzerland      Turkey           United States
## [269] Australia        Canada           Czech Rep.       Finland
## [273] France           Germany          Hong Kong, China Ireland
## [277] Japan            Korea, Rep.      Latvia           Netherlands
## [281] New Zealand      Norway           Philippines      Poland
## [285] Portugal         Romania          Singapore        Slovak Republic
## [289] Slovenia         Spain            Sweden           Switzerland
## [293] Turkey           United States    Australia        Canada
## [297] Czech Rep.       Finland          France           Germany
## [301] Hong Kong, China Ireland          Japan            Korea, Rep.
## [305] Latvia           Lithuania        Netherlands      New Zealand
## [309] Norway           Philippines      Poland           Portugal
## [313] Romania          Singapore        Slovak Republic  Slovenia
## [317] Spain            Sweden           Switzerland      Turkey
## [321] United States    Australia        Canada           Czech Rep.
## [325] Finland          France           Germany          Hong Kong, China
## [329] Ireland          Japan            Korea, Rep.      Latvia
## [333] Lithuania        Netherlands      New Zealand      Norway
## [337] Philippines      Poland           Portugal         Romania
## [341] Singapore        Slovak Republic  Slovenia         Spain
## [345] Sweden           Switzerland      Turkey           United States
## [349] Australia        Canada           Czech Rep.       Estonia
## [353] Finland          France           Germany          Hong Kong, China
## [357] Ireland          Japan            Korea, Rep.      Latvia
## [361] Lithuania        Netherlands      New Zealand      Norway
## [365] Philippines      Poland           Portugal         Romania
## [369] Slovak Republic  Slovenia         Spain            Sweden
## [373] Switzerland      Turkey           United States    Australia
## [377] Canada           Czech Rep.       Estonia          Finland
## [381] France           Germany          Hong Kong, China Ireland
## [385] Japan            Korea, Rep.      Latvia           Lithuania
## [389] Netherlands      New Zealand      Norway           Philippines
## [393] Poland           Portugal         Romania          Singapore
## [397] Slovak Republic  Slovenia         Spain            Sweden
## [401] Switzerland      Turkey           United Kingdom   United States
## [405] Australia        Canada           Czech Rep.       Estonia
## [409] Finland          France           Germany          Hong Kong, China
## [413] Ireland          Japan            Korea, Rep.      Latvia
## [417] Lithuania        Netherlands      New Zealand      Norway
## [421] Philippines      Poland           Portugal         Romania
## [425] Singapore        Slovak Republic  Slovenia         Spain
## [429] Sweden           Switzerland      Turkey           United Kingdom
## [433] United States    Australia        Canada           Czech Rep.
## [437] Estonia          Finland          France           Germany
## [441] Hong Kong, China Ireland          Japan            Korea, Rep.
## [445] Latvia           Lithuania        Netherlands      New Zealand
```

```
## [449] Norway           Philippines      Poland           Portugal
## [453] Romania          Singapore        Slovak Republic  Slovenia
## [457] Spain            Sweden           Switzerland      Turkey
## [461] United Kingdom   United States    Australia        Canada
## [465] Czech Rep.       Estonia          Finland          France
## [469] Germany          Hong Kong, China Ireland          Japan
## [473] Korea, Rep.      Latvia           Lithuania        Netherlands
## [477] New Zealand      Norway           Philippines      Poland
## [481] Portugal         Romania          Singapore        Slovak Republic
## [485] Slovenia         Spain            Sweden           Switzerland
## [489] Turkey           United Kingdom   United States    Australia
## [493] Canada           Czech Rep.       Estonia          Finland
## [497] France           Germany          Hong Kong, China Ireland
## [501] Japan            Korea, Rep.      Latvia           Lithuania
## [505] Netherlands      New Zealand      Norway           Philippines
## [509] Poland           Portugal         Romania          Slovenia
## [513] Spain            Sweden           Switzerland      Turkey
## [517] United Kingdom   United States
## attr(,"scores")
##                      Australia           Canada       Czech Rep.
##               NA            5.80             7.70            8.30
##          Estonia          Finland           France          Germany
##             9.05            7.20            10.80            9.10
## Hong Kong, China          Ireland            Japan      Korea, Rep.
##             1.50           13.40             2.60            2.40
##           Latvia        Lithuania      Netherlands      New Zealand
##            11.95           12.00             7.20            5.00
##           Norway      Philippines           Poland         Portugal
##             2.80            5.95            14.50            6.40
##          Romania        Singapore  Slovak Republic         Slovenia
##             5.90            1.60            15.75            6.20
##            Spain           Sweden      Switzerland           Turkey
##            19.80            3.70             4.00            5.50
##   United Kingdom    United States
##             3.40            4.80
## 30 Levels: Hong Kong, China Singapore Korea, Rep. Japan ...
```

```
boxplot(unplyd_year$unemployed~bymedian,
        ylab= "% Unemployment", las=3,
        par(mar = c(7, 5, 1, 2) + 0.1), col = 'lightblue',              cex.axis = 0.7,
        cex.lab = 0.9)
mtext('World Survey Unemployed Females aged 25-54', side=3, line = 0)
mtext('Country', side=1, line = 6)
text(9,10,"US",cex= 0.6, col= 'red')
```



###Plot

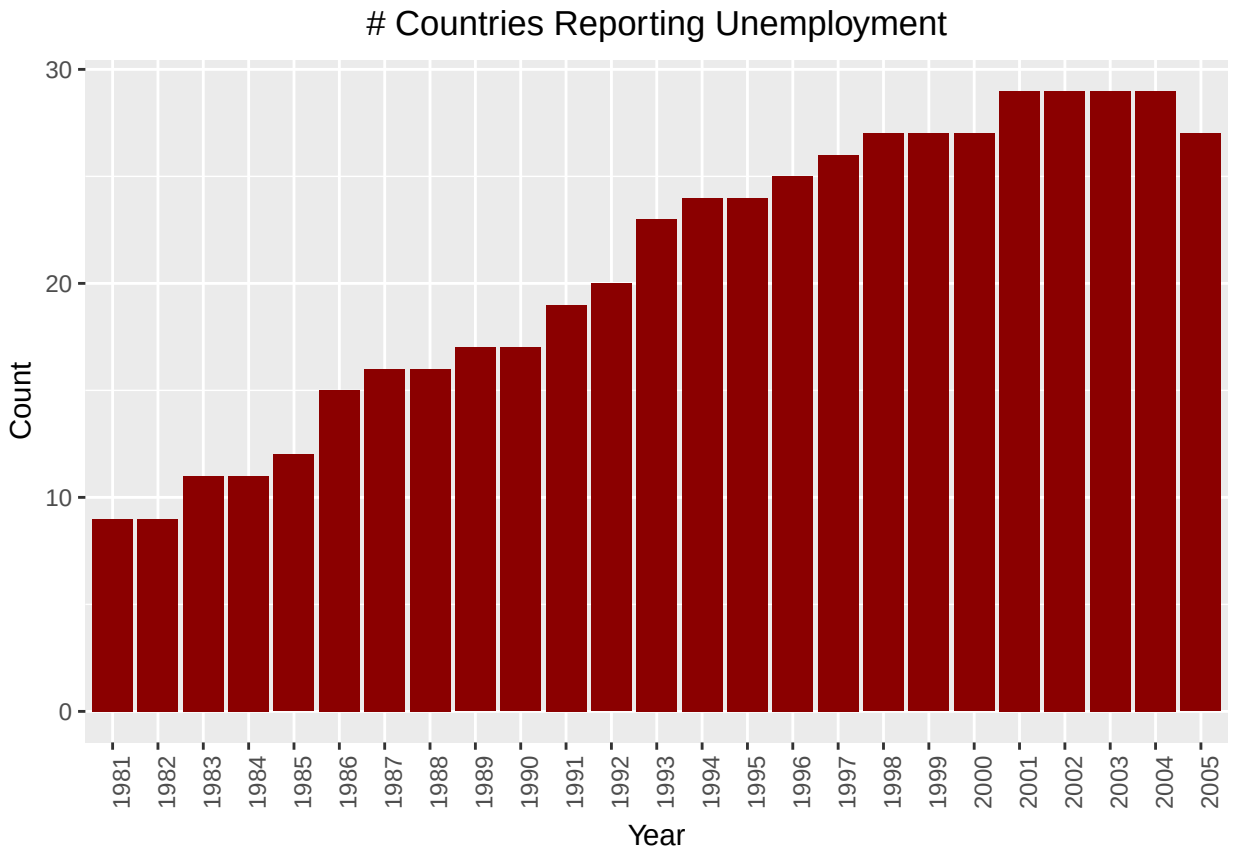
world unemployment by year

```
boxplot(unplyd_year$unemployed~unplyd_year$year,
        las=2, cex.axis = 0.8, col= 'lightgreen')
mtext('World Survey Unemployed Females aged 25-54', side=3, line = 1)
mtext('% Unemployment', side=2, line = 2)
mtext('Year', side=1, line = 3)
```

###Count

= number of countries reporting results

```
qplot(x = unplyd_year$year, data = unplyd_year,
      fill = I('darkred'),
      xlab = 'Year', ylab = 'Count',
      main = '# Countries Reporting Unemployment',
      )+
   theme(plot.title = element_text(hjust = 0.5), axis.text.x = element_text(angle = 90, hjust = 0))
```




```
unplyd_year %>% group_by(year) %>% summarise(n=n())
```

```
## # A tibble: 25 × 2
##     year     n
##    <chr> <int>
## 1   1981     9
## 2   1982     9
## 3   1983    11
## 4   1984    11
## 5   1985    12
## 6   1986    15
## 7   1987    16
## 8   1988    16
## 9   1989    17
## 10  1990    17
## # ... with 15 more rows
```

Statistics of Unemployment by Year

```
by(unplyd_year$unemployed,unplyd_year$year, summary)
```

```
## unplyd_year$year: 1981
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.500   2.000   3.400   4.367   7.100   7.500
## ------------------------------------------------------------
## unplyd_year$year: 1982
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.400   2.300   3.900   5.189   7.900  10.000
## ------------------------------------------------------------
## unplyd_year$year: 1983
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.700   2.550   7.600   6.664   9.600  13.900
## ------------------------------------------------------------
## unplyd_year$year: 1984
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.500   2.550   6.300   6.836   9.550  15.600
## ------------------------------------------------------------
## unplyd_year$year: 1985
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.400   2.475   4.700   6.758   9.700  17.000
## ------------------------------------------------------------
## unplyd_year$year: 1986
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.30    2.95    5.80    6.60    8.70   17.70
## ------------------------------------------------------------
## unplyd_year$year: 1987
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.900   2.525   5.750   6.962   9.175  19.800
## ------------------------------------------------------------
## unplyd_year$year: 1988
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.800   2.375   5.300   6.737   8.575  21.400
## ------------------------------------------------------------
## unplyd_year$year: 1989
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.600   2.100   5.200   6.465   7.400  21.000
## ------------------------------------------------------------
## unplyd_year$year: 1990
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.800   2.000   5.400   6.247   7.500  20.400
## ------------------------------------------------------------
## unplyd_year$year: 1991
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   3.200   5.400   6.632   8.300  20.800
## ------------------------------------------------------------
## unplyd_year$year: 1992
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    1.00    3.75    5.60    6.69    7.90   23.20
## ------------------------------------------------------------
## unplyd_year$year: 1993
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.100   4.550   6.400   7.626   9.800  26.500
## ------------------------------------------------------------
## unplyd_year$year: 1994
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   4.350   6.650   7.675   9.275  28.600
## ------------------------------------------------------------
## unplyd_year$year: 1995
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   0.900   4.075   5.500   7.279   8.525  27.800
```

```
## ------------------------------------------------------------
## unplyd_year$year: 1996
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.000   4.000   5.600   7.492   8.900  26.500
## ------------------------------------------------------------
## unplyd_year$year: 1997
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   1.500   4.400   6.250   7.438   9.675  25.500
## ------------------------------------------------------------
## unplyd_year$year: 1998
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.400   4.750   6.200   7.385   9.600  24.300
## ------------------------------------------------------------
## unplyd_year$year: 1999
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.100   4.350   5.500   7.207   9.200  21.100
## ------------------------------------------------------------
## unplyd_year$year: 2000
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.300   3.950   5.800   7.393  10.400  18.800
## ------------------------------------------------------------
## unplyd_year$year: 2001
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.500   3.600   5.200   6.776   9.100  17.600
## ------------------------------------------------------------
## unplyd_year$year: 2002
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.20    3.90    5.60    6.99    8.30   18.70
## ------------------------------------------------------------
## unplyd_year$year: 2003
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.600   4.300   6.200   7.131   9.100  18.300
## ------------------------------------------------------------
## unplyd_year$year: 2004
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.700   4.500   5.900   7.121   9.300  18.000
## ------------------------------------------------------------
## unplyd_year$year: 2005
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.90    4.30    6.00    6.57    8.20   17.70
```

Order by Countries, then Year

```
#using pipe %>%
acountry <- unplyd_year %>% arrange(country, year)
acountry
```

```
##              country year unemployed
## 1          Australia 1986        6.4
## 2          Australia 1987        6.4
## 3          Australia 1988        6.0
## 4          Australia 1989        5.2
## 5          Australia 1990        5.4
```

```
## 6          Australia 1991        7.0
## 7          Australia 1992        7.3
## 8          Australia 1993        7.6
## 9          Australia 1994        7.0
## 10         Australia 1995        5.9
## 11         Australia 1996        6.1
## 12         Australia 1997        6.3
## 13         Australia 1998        5.7
## 14         Australia 1999        5.3
## 15         Australia 2000        4.9
## 16         Australia 2001        5.2
## 17         Australia 2002        5.1
## 18         Australia 2003        5.0
## 19         Australia 2004        4.4
## 20         Australia 2005        4.2
## 21            Canada 1981        7.1
## 22            Canada 1982        9.1
## 23            Canada 1983       10.0
## 24            Canada 1984       10.2
## 25            Canada 1985        9.7
## 26            Canada 1986        8.9
## 27            Canada 1987        8.5
## 28            Canada 1988        7.7
## 29            Canada 1989        7.4
## 30            Canada 1990        7.5
## 31            Canada 1991        9.0
## 32            Canada 1992        9.3
## 33            Canada 1993        9.9
## 34            Canada 1994        9.0
## 35            Canada 1995        8.3
## 36            Canada 1996        8.5
## 37            Canada 1997        7.7
## 38            Canada 1998        6.9
## 39            Canada 1999        6.3
## 40            Canada 2000        5.8
## 41            Canada 2001        6.0
## 42            Canada 2002        6.2
## 43            Canada 2003        6.3
## 44            Canada 2004        5.9
## 45            Canada 2005        5.7
## 46       Czech Rep. 1993        4.5
## 47       Czech Rep. 1994        4.4
## 48       Czech Rep. 1995        4.1
## 49       Czech Rep. 1996        4.0
## 50       Czech Rep. 1997        5.2
## 51       Czech Rep. 1998        7.3
## 52       Czech Rep. 1999        9.5
## 53       Czech Rep. 2000        9.9
## 54       Czech Rep. 2001        9.1
## 55       Czech Rep. 2002        8.3
## 56       Czech Rep. 2003        9.3
## 57       Czech Rep. 2004        9.3
## 58       Czech Rep. 2005        9.3
## 59          Estonia 2000       12.3
```

```
## 60          Estonia 2001      11.1
## 61          Estonia 2002       9.3
## 62          Estonia 2003       8.8
## 63          Estonia 2004       8.3
## 64          Estonia 2005       7.0
## 65          Finland 1981       3.4
## 66          Finland 1982       3.9
## 67          Finland 1983       3.8
## 68          Finland 1984       3.5
## 69          Finland 1985       3.2
## 70          Finland 1986       3.3
## 71          Finland 1987       3.5
## 72          Finland 1988       3.2
## 73          Finland 1989       1.9
## 74          Finland 1990       1.6
## 75          Finland 1991       3.8
## 76          Finland 1992       7.6
## 77          Finland 1993      12.1
## 78          Finland 1994      12.5
## 79          Finland 1995      13.0
## 80          Finland 1996      12.6
## 81          Finland 1997      11.1
## 82          Finland 1998      10.0
## 83          Finland 1999       8.9
## 84          Finland 2000       8.8
## 85          Finland 2001       8.0
## 86          Finland 2002       7.3
## 87          Finland 2003       7.0
## 88          Finland 2004       7.5
## 89          Finland 2005       7.2
## 90           France 1981       7.5
## 91           France 1982       7.9
## 92           France 1983       8.1
## 93           France 1984       8.9
## 94           France 1985       9.7
## 95           France 1986      10.4
## 96           France 1987      11.2
## 97           France 1988      11.2
## 98           France 1989      11.1
## 99           France 1990      10.5
## 100          France 1991      10.8
## 101          France 1992      11.4
## 102          France 1993      12.4
## 103          France 1994      13.0
## 104          France 1995      12.5
## 105          France 1996      13.1
## 106          France 1997      13.0
## 107          France 1998      12.7
## 108          France 1999      12.0
## 109          France 2000      10.9
## 110          France 2001       9.9
## 111          France 2002       9.8
## 112          France 2003      10.3
## 113          France 2004      10.4
```

```
## 114           France 2005       10.3
## 115          Germany 1991        7.1
## 116          Germany 1992        8.5
## 117          Germany 1993        9.7
## 118          Germany 1994       10.1
## 119          Germany 1995        9.2
## 120          Germany 1996        8.9
## 121          Germany 1997        9.8
## 122          Germany 1998        9.2
## 123          Germany 1999        8.3
## 124          Germany 2000        7.8
## 125          Germany 2001        7.8
## 126          Germany 2002        8.0
## 127          Germany 2003        9.1
## 128          Germany 2004        9.8
## 129          Germany 2005       10.2
## 130 Hong Kong, China 1985        1.4
## 131 Hong Kong, China 1986        1.3
## 132 Hong Kong, China 1987        0.9
## 133 Hong Kong, China 1988        0.8
## 134 Hong Kong, China 1989        0.6
## 135 Hong Kong, China 1990        0.8
## 136 Hong Kong, China 1991        1.0
## 137 Hong Kong, China 1992        1.4
## 138 Hong Kong, China 1993        1.3
## 139 Hong Kong, China 1994        1.2
## 140 Hong Kong, China 1995        2.2
## 141 Hong Kong, China 1996        1.7
## 142 Hong Kong, China 1997        1.5
## 143 Hong Kong, China 1998        2.9
## 144 Hong Kong, China 1999        3.6
## 145 Hong Kong, China 2000        3.0
## 146 Hong Kong, China 2001        3.0
## 147 Hong Kong, China 2002        5.1
## 148 Hong Kong, China 2003        5.5
## 149 Hong Kong, China 2004        5.1
## 150 Hong Kong, China 2005        3.9
## 151          Ireland 1983       13.9
## 152          Ireland 1984       15.6
## 153          Ireland 1985       17.0
## 154          Ireland 1986       17.7
## 155          Ireland 1987       16.7
## 156          Ireland 1988       15.9
## 157          Ireland 1989       14.9
## 158          Ireland 1990       13.5
## 159          Ireland 1991       14.6
## 160          Ireland 1992       13.7
## 161          Ireland 1993       14.0
## 162          Ireland 1994       13.4
## 163          Ireland 1995       10.8
## 164          Ireland 1996       10.7
## 165          Ireland 1997        9.3
## 166          Ireland 1998        6.7
## 167          Ireland 1999        4.8
```

```
## 168          Ireland 2000       3.6
## 169          Ireland 2001       3.0
## 170          Ireland 2002       3.2
## 171          Ireland 2003       3.4
## 172          Ireland 2004       3.1
## 173          Ireland 2005       3.2
## 174            Japan 1981       2.0
## 175            Japan 1982       2.0
## 176            Japan 1983       2.4
## 177            Japan 1984       2.6
## 178            Japan 1985       2.5
## 179            Japan 1986       2.6
## 180            Japan 1987       2.6
## 181            Japan 1988       2.4
## 182            Japan 1989       2.1
## 183            Japan 1990       2.0
## 184            Japan 1991       2.1
## 185            Japan 1992       2.1
## 186            Japan 1993       2.5
## 187            Japan 1994       2.8
## 188            Japan 1995       3.1
## 189            Japan 1996       3.2
## 190            Japan 1997       3.2
## 191            Japan 1998       3.9
## 192            Japan 1999       4.4
## 193            Japan 2000       4.3
## 194            Japan 2001       4.6
## 195            Japan 2002       5.2
## 196            Japan 2003       4.9
## 197            Japan 2004       4.5
## 198            Japan 2005       4.4
## 199      Korea, Rep. 1992       1.0
## 200      Korea, Rep. 1993       1.1
## 201      Korea, Rep. 1994       1.0
## 202      Korea, Rep. 1995       0.9
## 203      Korea, Rep. 1996       1.0
## 204      Korea, Rep. 1997       1.6
## 205      Korea, Rep. 1998       4.8
## 206      Korea, Rep. 1999       4.3
## 207      Korea, Rep. 2000       3.0
## 208      Korea, Rep. 2001       2.7
## 209      Korea, Rep. 2002       2.2
## 210      Korea, Rep. 2003       2.6
## 211      Korea, Rep. 2004       2.7
## 212      Korea, Rep. 2005       2.9
## 213           Latvia 1996      17.6
## 214           Latvia 1997      14.5
## 215           Latvia 1998      12.9
## 216           Latvia 1999      13.0
## 217           Latvia 2000      12.9
## 218           Latvia 2001      11.0
## 219           Latvia 2002       9.7
## 220           Latvia 2003       9.9
## 221           Latvia 2004       9.4
```

```
## 222          Latvia 2005       8.1
## 223       Lithuania 1998      11.4
## 224       Lithuania 1999      12.7
## 225       Lithuania 2000      13.5
## 226       Lithuania 2001      14.7
## 227       Lithuania 2002      12.6
## 228       Lithuania 2003      10.6
## 229       Lithuania 2004      11.0
## 230       Lithuania 2005       8.2
## 231     Netherlands 1987      12.7
## 232     Netherlands 1988      12.2
## 233     Netherlands 1989      11.1
## 234     Netherlands 1990      10.3
## 235     Netherlands 1991       9.3
## 236     Netherlands 1992       7.3
## 237     Netherlands 1993       7.2
## 238     Netherlands 1994       7.9
## 239     Netherlands 1995       7.7
## 240     Netherlands 1996       7.2
## 241     Netherlands 1997       6.2
## 242     Netherlands 1998       4.7
## 243     Netherlands 1999       3.5
## 244     Netherlands 2000       3.2
## 245     Netherlands 2001       2.9
## 246     Netherlands 2002       3.2
## 247     Netherlands 2003       3.9
## 248     Netherlands 2004       4.6
## 249     Netherlands 2005       4.8
## 250     New Zealand 1986       3.6
## 251     New Zealand 1987       3.2
## 252     New Zealand 1988       4.2
## 253     New Zealand 1989       5.2
## 254     New Zealand 1990       5.4
## 255     New Zealand 1991       7.5
## 256     New Zealand 1992       7.7
## 257     New Zealand 1993       6.9
## 258     New Zealand 1994       5.9
## 259     New Zealand 1995       5.0
## 260     New Zealand 1996       5.0
## 261     New Zealand 1997       5.3
## 262     New Zealand 1998       6.2
## 263     New Zealand 1999       5.3
## 264     New Zealand 2000       4.6
## 265     New Zealand 2001       4.1
## 266     New Zealand 2002       4.2
## 267     New Zealand 2003       3.9
## 268     New Zealand 2004       3.4
## 269     New Zealand 2005       3.0
## 270          Norway 1981       2.3
## 271          Norway 1982       2.3
## 272          Norway 1983       2.7
## 273          Norway 1984       2.5
## 274          Norway 1985       2.6
## 275          Norway 1986       1.8
```

```
## 276          Norway 1987       1.9
## 277          Norway 1988       2.3
## 278          Norway 1989       3.5
## 279          Norway 1990       4.0
## 280          Norway 1991       3.8
## 281          Norway 1992       4.1
## 282          Norway 1993       4.1
## 283          Norway 1994       3.8
## 284          Norway 1995       3.7
## 285          Norway 1996       3.8
## 286          Norway 1997       3.4
## 287          Norway 1998       2.4
## 288          Norway 1999       2.1
## 289          Norway 2000       2.3
## 290          Norway 2001       2.5
## 291          Norway 2002       2.8
## 292          Norway 2003       3.3
## 293          Norway 2004       3.4
## 294          Norway 2005       3.8
## 295     Philippines 1986       7.0
## 296     Philippines 1987       7.8
## 297     Philippines 1988       7.0
## 298     Philippines 1989       6.8
## 299     Philippines 1990       6.7
## 300     Philippines 1991       7.6
## 301     Philippines 1992       5.2
## 302     Philippines 1993       4.9
## 303     Philippines 1994       4.9
## 304     Philippines 1995       5.1
## 305     Philippines 1996       4.6
## 306     Philippines 1997       6.3
## 307     Philippines 1998       5.3
## 308     Philippines 1999       4.8
## 309     Philippines 2000       5.9
## 310     Philippines 2001       5.7
## 311     Philippines 2002       6.0
## 312     Philippines 2003       6.3
## 313     Philippines 2004       6.5
## 314     Philippines 2005       5.1
## 315          Poland 1993      14.4
## 316          Poland 1994      14.5
## 317          Poland 1995      13.2
## 318          Poland 1996      12.5
## 319          Poland 1997      12.0
## 320          Poland 1998      11.2
## 321          Poland 1999      13.6
## 322          Poland 2000      15.9
## 323          Poland 2001      17.6
## 324          Poland 2002      18.7
## 325          Poland 2003      18.3
## 326          Poland 2004      18.0
## 327          Poland 2005      17.7
## 328        Portugal 1983       9.2
## 329        Portugal 1984       8.4
```

```
## 330        Portugal 1985       8.6
## 331        Portugal 1986       8.5
## 332        Portugal 1987       7.2
## 333        Portugal 1988       6.1
## 334        Portugal 1989       5.7
## 335        Portugal 1990       5.5
## 336        Portugal 1991       4.9
## 337        Portugal 1992       4.0
## 338        Portugal 1993       5.4
## 339        Portugal 1994       7.0
## 340        Portugal 1995       7.2
## 341        Portugal 1996       7.1
## 342        Portugal 1997       6.4
## 343        Portugal 1998       5.7
## 344        Portugal 1999       4.7
## 345        Portugal 2000       4.4
## 346        Portugal 2001       4.5
## 347        Portugal 2002       5.6
## 348        Portugal 2003       6.8
## 349        Portugal 2004       7.1
## 350        Portugal 2005       8.4
## 351         Romania 1994       7.3
## 352         Romania 1995       7.7
## 353         Romania 1996       5.6
## 354         Romania 1997       5.0
## 355         Romania 1998       5.1
## 356         Romania 1999       5.7
## 357         Romania 2000       6.3
## 358         Romania 2001       5.6
## 359         Romania 2002       6.9
## 360         Romania 2003       5.8
## 361         Romania 2004       6.2
## 362         Romania 2005       6.0
## 363       Singapore 1981       1.5
## 364       Singapore 1982       1.4
## 365       Singapore 1983       1.7
## 366       Singapore 1984       1.5
## 367       Singapore 1985       2.4
## 368       Singapore 1986       3.3
## 369       Singapore 1987       2.3
## 370       Singapore 1988       1.5
## 371       Singapore 1989       0.9
## 372       Singapore 1990       0.9
## 373       Singapore 1991       1.3
## 374       Singapore 1992       1.4
## 375       Singapore 1993       1.3
## 376       Singapore 1994       1.4
## 377       Singapore 1995       1.7
## 378       Singapore 1996       1.6
## 379       Singapore 1997       1.6
## 380       Singapore 1998       2.5
## 381       Singapore 1999       3.1
## 382       Singapore 2001       2.8
## 383       Singapore 2002       3.9
```

```
## 384        Singapore 2003        4.3
## 385        Singapore 2004        3.8
## 386  Slovak Republic 1997       11.0
## 387  Slovak Republic 1998       11.2
## 388  Slovak Republic 1999       13.4
## 389  Slovak Republic 2000       15.8
## 390  Slovak Republic 2001       15.8
## 391  Slovak Republic 2002       15.8
## 392  Slovak Republic 2003       15.7
## 393  Slovak Republic 2004       17.5
## 394         Slovenia 1993        6.6
## 395         Slovenia 1994        6.5
## 396         Slovenia 1995        5.1
## 397         Slovenia 1996        5.3
## 398         Slovenia 1997        5.4
## 399         Slovenia 1998        6.4
## 400         Slovenia 1999        6.2
## 401         Slovenia 2000        6.2
## 402         Slovenia 2001        5.1
## 403         Slovenia 2002        5.5
## 404         Slovenia 2003        6.2
## 405         Slovenia 2004        5.5
## 406         Slovenia 2005        6.2
## 407            Spain 1981        7.3
## 408            Spain 1982       10.0
## 409            Spain 1983       11.5
## 410            Spain 1984       13.5
## 411            Spain 1985       15.9
## 412            Spain 1986       16.6
## 413            Spain 1987       19.8
## 414            Spain 1988       21.4
## 415            Spain 1989       21.0
## 416            Spain 1990       20.4
## 417            Spain 1991       20.8
## 418            Spain 1992       23.2
## 419            Spain 1993       26.5
## 420            Spain 1994       28.6
## 421            Spain 1995       27.8
## 422            Spain 1996       26.5
## 423            Spain 1997       25.5
## 424            Spain 1998       24.3
## 425            Spain 1999       21.1
## 426            Spain 2000       18.8
## 427            Spain 2001       13.7
## 428            Spain 2002       15.1
## 429            Spain 2003       14.8
## 430            Spain 2004       13.8
## 431            Spain 2005       10.9
## 432           Sweden 1981        1.9
## 433           Sweden 1982        2.4
## 434           Sweden 1983        2.4
## 435           Sweden 1984        2.2
## 436           Sweden 1985        1.9
## 437           Sweden 1986        1.8
```

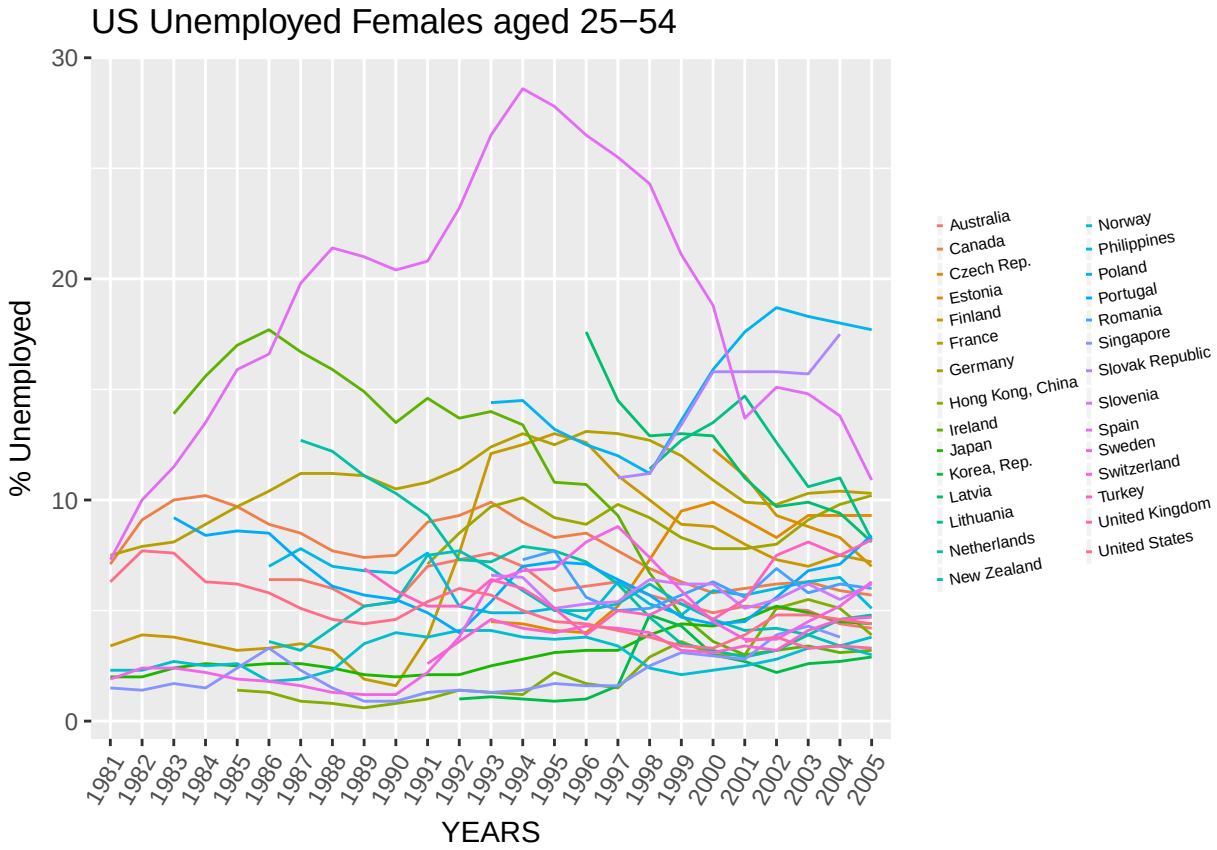
```
## 438           Sweden 1987       1.6
## 439           Sweden 1988       1.3
## 440           Sweden 1989       1.2
## 441           Sweden 1990       1.2
## 442           Sweden 1991       2.2
## 443           Sweden 1992       3.8
## 444           Sweden 1993       6.3
## 445           Sweden 1994       6.8
## 446           Sweden 1995       6.9
## 447           Sweden 1996       8.1
## 448           Sweden 1997       8.8
## 449           Sweden 1998       7.4
## 450           Sweden 1999       5.9
## 451           Sweden 2000       4.5
## 452           Sweden 2001       3.7
## 453           Sweden 2002       3.7
## 454           Sweden 2003       4.5
## 455           Sweden 2004       5.2
## 456           Sweden 2005       6.3
## 457      Switzerland 1991       2.6
## 458      Switzerland 1992       3.6
## 459      Switzerland 1993       4.6
## 460      Switzerland 1994       4.2
## 461      Switzerland 1995       4.0
## 462      Switzerland 1996       4.3
## 463      Switzerland 1997       4.2
## 464      Switzerland 1998       4.0
## 465      Switzerland 1999       3.2
## 466      Switzerland 2000       3.1
## 467      Switzerland 2001       3.4
## 468      Switzerland 2002       3.2
## 469      Switzerland 2003       4.1
## 470      Switzerland 2004       4.6
## 471      Switzerland 2005       4.7
## 472           Turkey 1989       6.9
## 473           Turkey 1990       5.9
## 474           Turkey 1991       5.2
## 475           Turkey 1992       5.2
## 476           Turkey 1993       6.4
## 477           Turkey 1994       6.0
## 478           Turkey 1995       5.1
## 479           Turkey 1996       3.9
## 480           Turkey 1997       5.0
## 481           Turkey 1998       4.8
## 482           Turkey 1999       5.5
## 483           Turkey 2000       4.6
## 484           Turkey 2001       5.5
## 485           Turkey 2002       7.5
## 486           Turkey 2003       8.1
## 487           Turkey 2004       7.5
## 488           Turkey 2005       8.2
## 489   United Kingdom 2001       3.6
## 490   United Kingdom 2002       3.8
## 491   United Kingdom 2003       3.3
```

```
## 492   United Kingdom 2004        3.4
## 493   United Kingdom 2005        3.3
## 494    United States 1981        6.3
## 495    United States 1982        7.7
## 496    United States 1983        7.6
## 497    United States 1984        6.3
## 498    United States 1985        6.2
## 499    United States 1986        5.8
## 500    United States 1987        5.1
## 501    United States 1988        4.6
## 502    United States 1989        4.4
## 503    United States 1990        4.6
## 504    United States 1991        5.4
## 505    United States 1992        6.0
## 506    United States 1993        5.7
## 507    United States 1994        5.0
## 508    United States 1995        4.5
## 509    United States 1996        4.4
## 510    United States 1997        4.1
## 511    United States 1998        3.8
## 512    United States 1999        3.4
## 513    United States 2000        3.3
## 514    United States 2001        3.9
## 515    United States 2002        4.8
## 516    United States 2003        4.8
## 517    United States 2004        4.6
## 518    United States 2005        4.4
```

```
#using group_by
grouped <-group_by(acountry, country, year)
```

Line graph of Unemployment by year in all Countries

```
ggplot(data=acountry, aes(acountry$year, acountry$unemployed,
                          colour = acountry$country,
                          group = acountry$country))+
  geom_line()+
  xlab('YEARS') +
  ylab('% Unemployed')+
  theme(axis.text.x=element_text(angle=60, hjust=1),
        legend.key.size = unit(0.1,'cm'),
        legend.text = element_text(angle = 10, size = 6),
        legend.title = element_blank())+
  ggtitle('US Unemployed Females aged 25-54')
```



###Summarise Stats by group (country or year) cannot skip first pipe otherwise grouping is wrong

```
acountry %>%
  group_by(country) %>%
  summarise(mean=mean(unemployed), sum = sum(unemployed),
  n= n())
```

```
## # A tibble: 29 × 4
##              country      mean   sum     n
##                <fctr>     <dbl> <dbl> <int>
## 1          Australia  5.820000 116.4    20
## 2             Canada  7.876000 196.9    25
## 3         Czech Rep.  7.246154  94.2    13
## 4            Estonia  9.466667  56.8     6
## 5            Finland  6.748000 168.7    25
## 6             France 10.760000 269.0    25
## 7            Germany  8.900000 133.5    15
## 8  Hong Kong, China  2.295238  48.2    21
## 9            Ireland 10.552174 242.7    23
## 10             Japan  3.136000  78.4    25
## # ... with 19 more rows
```

```
acountry %>%
  group_by(year) %>%
  summarise(mean=mean(unemployed), sum = sum(unemployed),
  n= n())
```

```
## # A tibble: 25 × 4
##     year     mean   sum     n
```

```
##    <chr>    <dbl> <dbl> <int>
## 1   1981 4.366667  39.3     9
## 2   1982 5.188889  46.7     9
## 3   1983 6.663636  73.3    11
## 4   1984 6.836364  75.2    11
## 5   1985 6.758333  81.1    12
## 6   1986 6.600000  99.0    15
## 7   1987 6.962500 111.4    16
## 8   1988 6.737500 107.8    16
## 9   1989 6.464706 109.9    17
## 10  1990 6.247059 106.2    17
## # ... with 15 more rows
```

```
# following gives overall stats for entire DF not "arranged" dataframe
acountry %>%
  summarise(mean=mean(unemployed), sum = sum(unemployed),
  n= n())
```

```
##       mean    sum   n
## 1 6.965637 3608.2 518
```

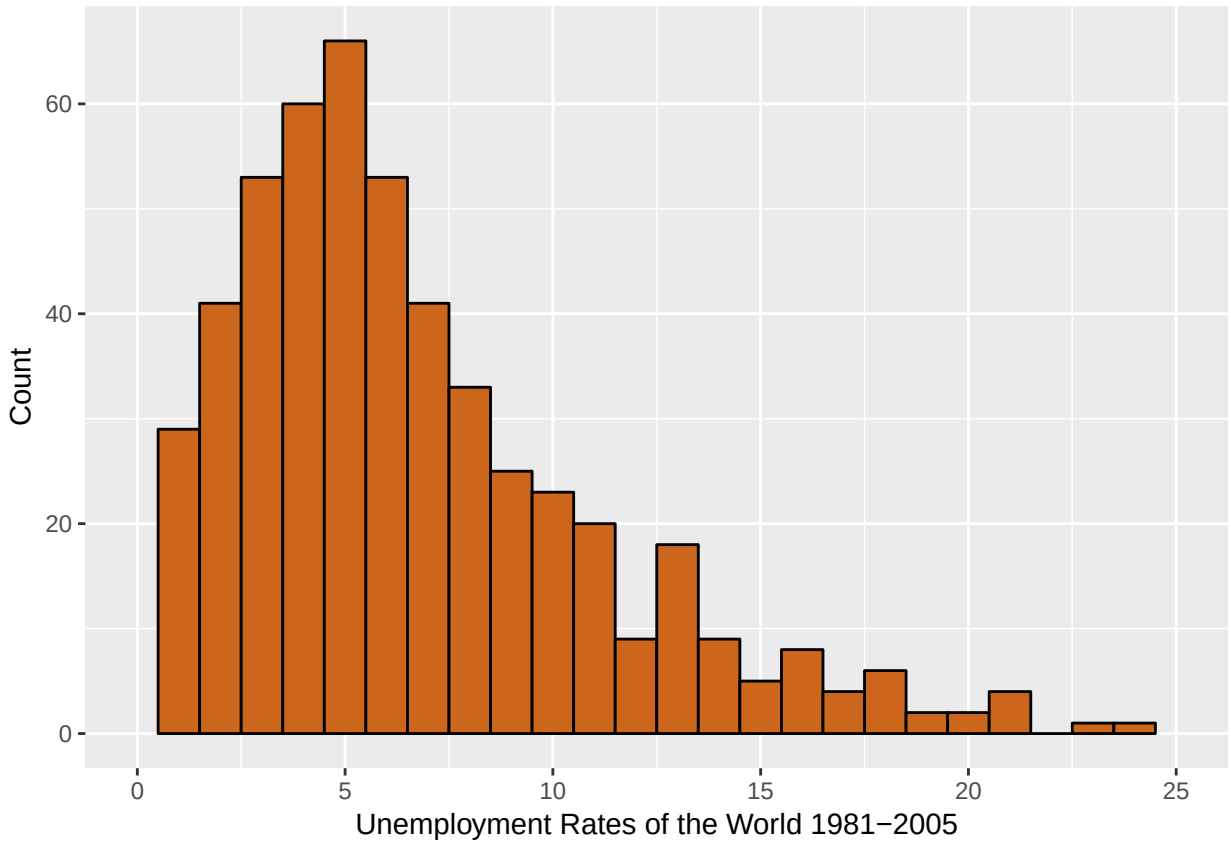
Graph of 2 countries from separate DFs

```
us <-subset(acountry, acountry$country == 'United States')
spain <-subset(acountry, acountry$country == 'Spain')
ggplot()+
  geom_line(aes(us$year, us$unemployed,
                color =country, group = 1),us)+
  geom_line(aes(spain$year, spain$unemployed,
                color =country, group =1),spain) +
  xlab('YEARS') +
  ylab('% Unemployed')+
  theme(axis.text.x=element_text(angle=60, hjust=1))+
  ggtitle('Unemployed Females aged 25-54')
```

###Distribution of the Unemployment Rate

```
dist1 <-qplot(x = unplyd_year$unemployed, data = unplyd_year, binwidth = 1,
      xlab = "Unemployment Rates of the World 1981-2005",
      ylab = "Count",
      color = I('black'), fill = I('chocolate3'))+
  scale_x_continuous(breaks = seq(0,25, by=5), limits = c(0,25))
dist1
```

```
## Warning: Removed 5 rows containing non-finite values (stat_bin).
```



###Frequency Polygon add frequency line to distribution graph

```
dist1 + geom_freqpoly(colour = 'blue', binwidth = 0.75)
```

```
## Warning: Removed 5 rows containing non-finite values (stat_bin).
```

```
## Warning: Removed 5 rows containing non-finite values (stat_bin).
```

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

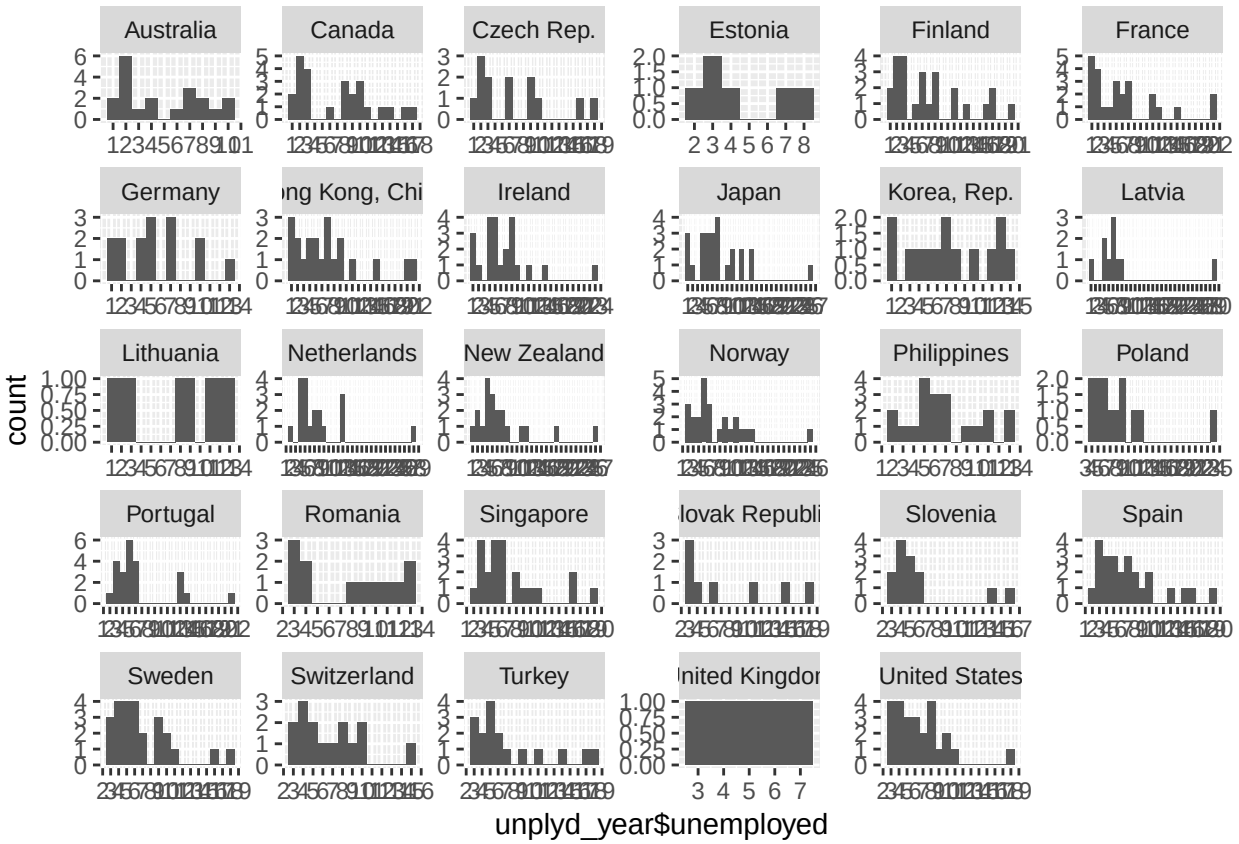
###Transformations Square Root transformation of scale

```
dist2 <-qplot(x = unplyd_year$unemployed, data = unplyd_year, binwidth = .2,
      xlab = "Unemployment Rates of the World 1981-2005",
      ylab = "Count",
      color = I('black'), fill = I('blue'))+
  scale_x_sqrt(breaks = seq(0,30, by=5), limits = c(0,35))
dist2
```

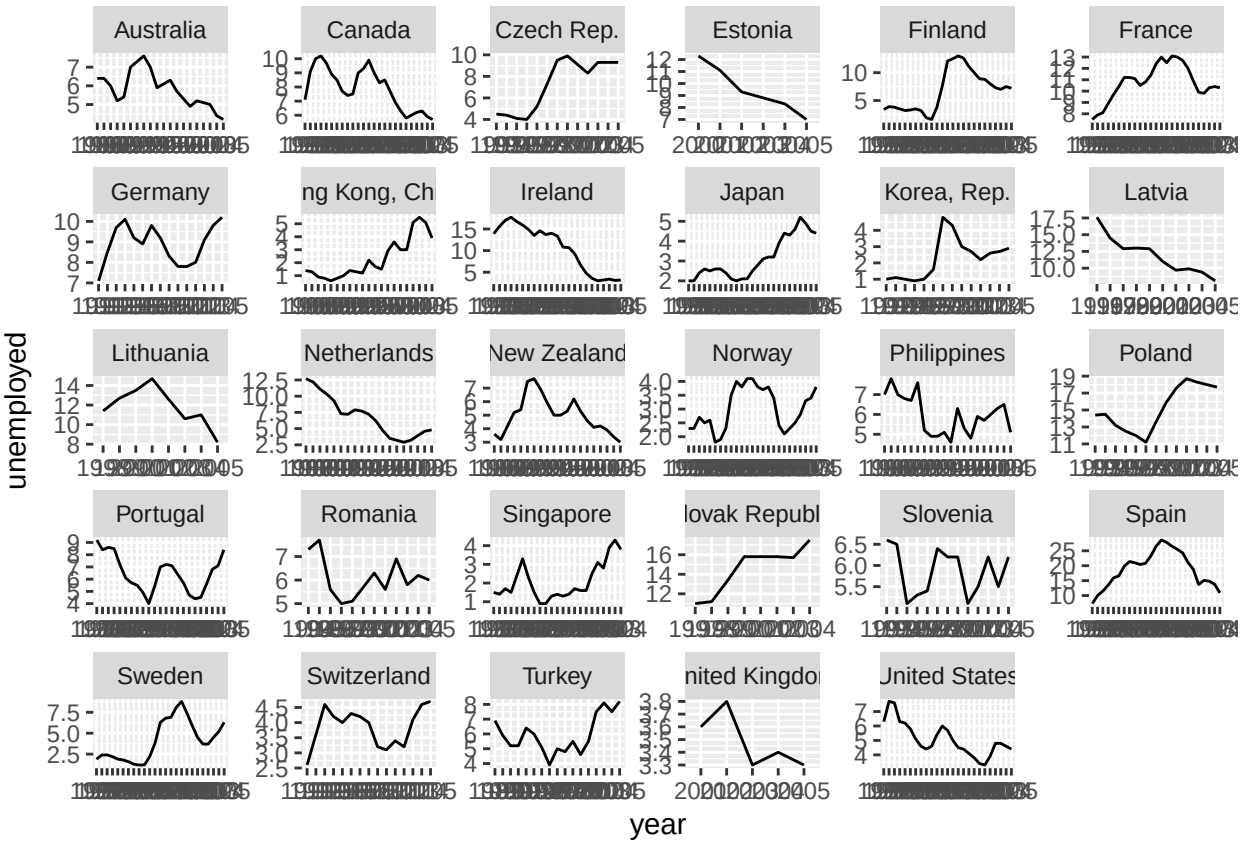
```
## Warning: Removed 1 rows containing missing values (geom_bar).
```

###Facet Wrap first option does some type of couont/distribution plot while the second with geom_line plots the unemployment v year per country

```
qplot(unplyd_year$unemployed,
      data =unplyd_year,
      binwidth = 1) +
  scale_x_continuous(breaks = 1:31) +
  facet_wrap(~unplyd_year$country, scales ='free')
```




```
ggplot(unplyd_year, aes(year, unemployed, group=country))+
  geom_line()+
  facet_wrap(~unplyd_year$country, scales ='free')
```




```
subset(unplyd_year, unplyd_year$country == 'Spain')
```

```
##     country year unemployed
## 24    Spain 1981        7.3
## 53    Spain 1982       10.0
## 82    Spain 1983       11.5
## 111   Spain 1984       13.5
## 140   Spain 1985       15.9
## 169   Spain 1986       16.6
## 198   Spain 1987       19.8
## 227   Spain 1988       21.4
## 256   Spain 1989       21.0
## 285   Spain 1990       20.4
## 314   Spain 1991       20.8
## 343   Spain 1992       23.2
## 372   Spain 1993       26.5
## 401   Spain 1994       28.6
## 430   Spain 1995       27.8
## 459   Spain 1996       26.5
## 488   Spain 1997       25.5
## 517   Spain 1998       24.3
## 546   Spain 1999       21.1
## 575   Spain 2000       18.8
## 604   Spain 2001       13.7
## 633   Spain 2002       15.1
## 662   Spain 2003       14.8
## 691   Spain 2004       13.8
```

```
## 720   Spain 2005       10.9
```

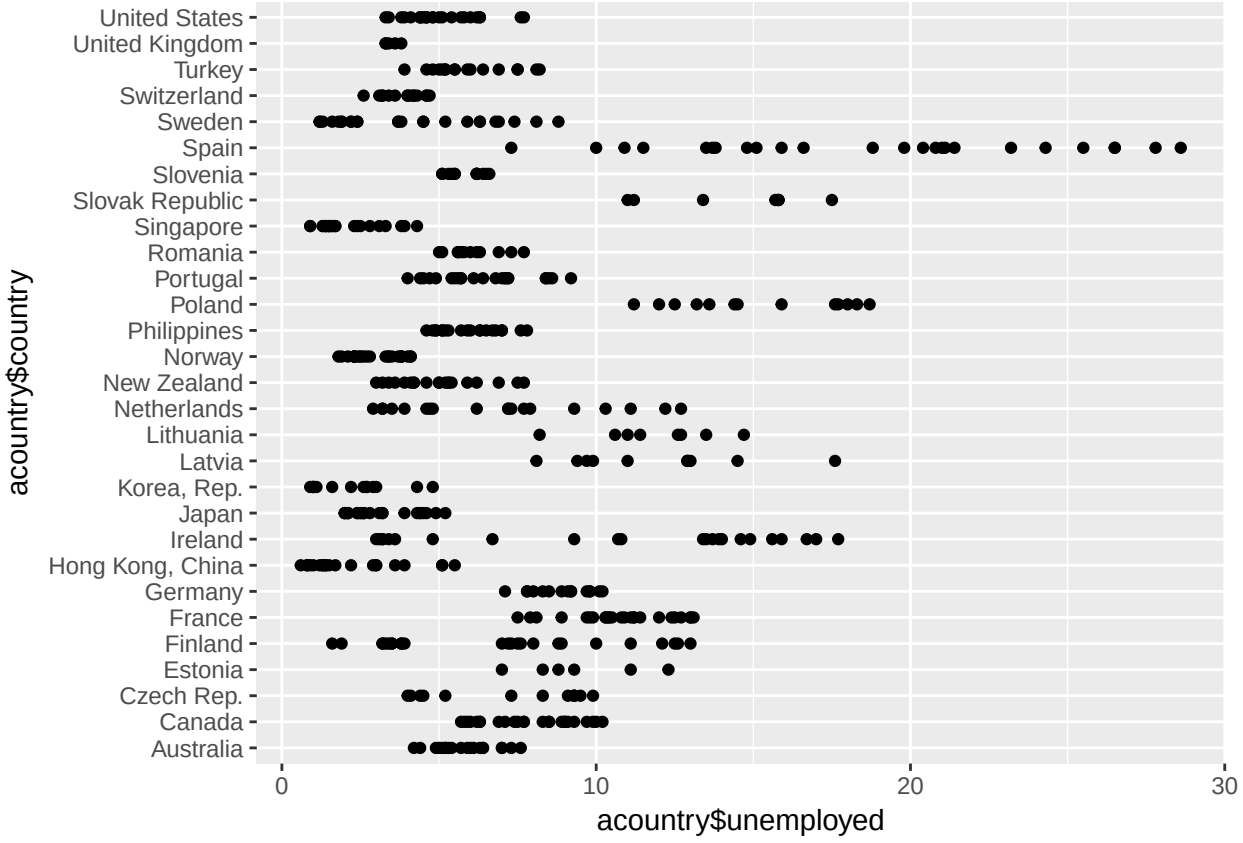
```
sample(unplyd_year$country,5)
```

```
## [1] Singapore   Finland     Finland     Philippines Lithuania
## 30 Levels:  Australia Canada Czech Rep. Estonia Finland France ... United States
```

```
unplyd_year[sample(nrow(unplyd_year), 5),]
```

```
##           country year unemployed
## 349     Australia 1993        7.6
## 145 United States 1985        6.2
## 451        Norway 1996        3.8
## 535     Lithuania 1999       12.7
## 140         Spain 1985       15.9
```

```
ggplot(acountry, aes(acountry$unemployed,
                     acountry$country,))+
  geom_point()
```




```
acountry2 <- acountry
unique(levels(acountry2$country))
```

```
##  [1] ""                "Australia"       "Canada"
##  [4] "Czech Rep."      "Estonia"         "Finland"
##  [7] "France"          "Germany"         "Hong Kong, China"
## [10] "Ireland"         "Japan"           "Korea, Rep."
## [13] "Latvia"          "Lithuania"       "Netherlands"
## [16] "New Zealand"     "Norway"          "Philippines"
## [19] "Poland"          "Portugal"        "Romania"
```

```
## [22] "Singapore"        "Slovak Republic"  "Slovenia"
## [25] "Spain"            "Sweden"           "Switzerland"
## [28] "Turkey"           "United Kingdom"   "United States"
```

```
levels(acountry$country)
```

```
##  [1] ""                 "Australia"        "Canada"
##  [4] "Czech Rep."       "Estonia"          "Finland"
##  [7] "France"           "Germany"          "Hong Kong, China"
## [10] "Ireland"          "Japan"            "Korea, Rep."
## [13] "Latvia"           "Lithuania"        "Netherlands"
## [16] "New Zealand"      "Norway"           "Philippines"
## [19] "Poland"           "Portugal"         "Romania"
## [22] "Singapore"        "Slovak Republic"  "Slovenia"
## [25] "Spain"            "Sweden"           "Switzerland"
## [28] "Turkey"           "United Kingdom"   "United States"
```

Relevel the countries by unemployment

```
acountry2$country2 <-factor(
  acountry$country,
  levels=acountry2[order(acountry2$unemployed), 'country'])
```

```
## Warning in `levels<-`(`*tmp*`, value = if (nl == nL) as.character(labels)
## else paste0(labels, : duplicated levels in factors are deprecated
```

```
levels(acountry2$country)
```

```
##  [1] ""                 "Australia"        "Canada"
##  [4] "Czech Rep."       "Estonia"          "Finland"
##  [7] "France"           "Germany"          "Hong Kong, China"
## [10] "Ireland"          "Japan"            "Korea, Rep."
## [13] "Latvia"           "Lithuania"        "Netherlands"
## [16] "New Zealand"      "Norway"           "Philippines"
## [19] "Poland"           "Portugal"         "Romania"
## [22] "Singapore"        "Slovak Republic"  "Slovenia"
## [25] "Spain"            "Sweden"           "Switzerland"
## [28] "Turkey"           "United Kingdom"   "United States"
```

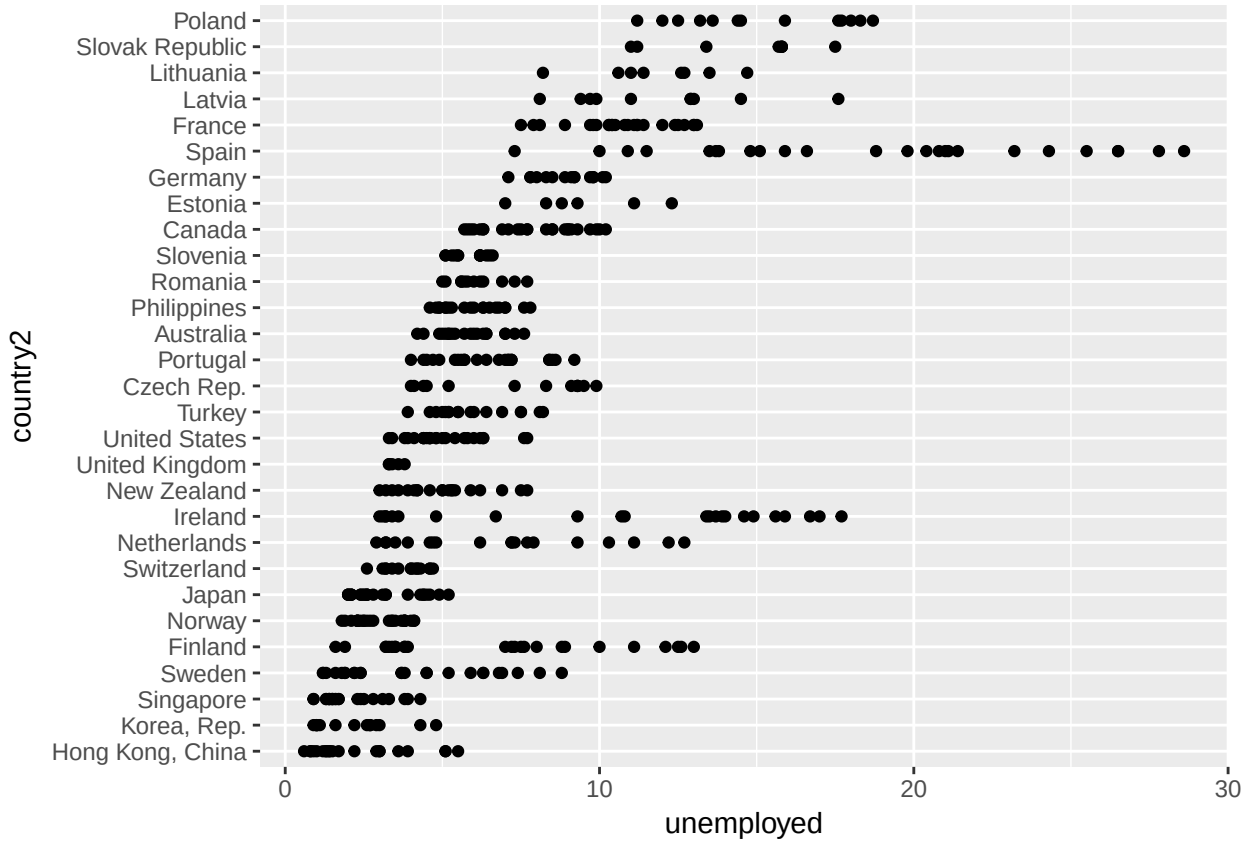
```
unique(levels(acountry2$country))
```

```
##  [1] ""                 "Australia"        "Canada"
##  [4] "Czech Rep."       "Estonia"          "Finland"
##  [7] "France"           "Germany"          "Hong Kong, China"
## [10] "Ireland"          "Japan"            "Korea, Rep."
## [13] "Latvia"           "Lithuania"        "Netherlands"
## [16] "New Zealand"      "Norway"           "Philippines"
## [19] "Poland"           "Portugal"         "Romania"
## [22] "Singapore"        "Slovak Republic"  "Slovenia"
## [25] "Spain"            "Sweden"           "Switzerland"
## [28] "Turkey"           "United Kingdom"   "United States"
```

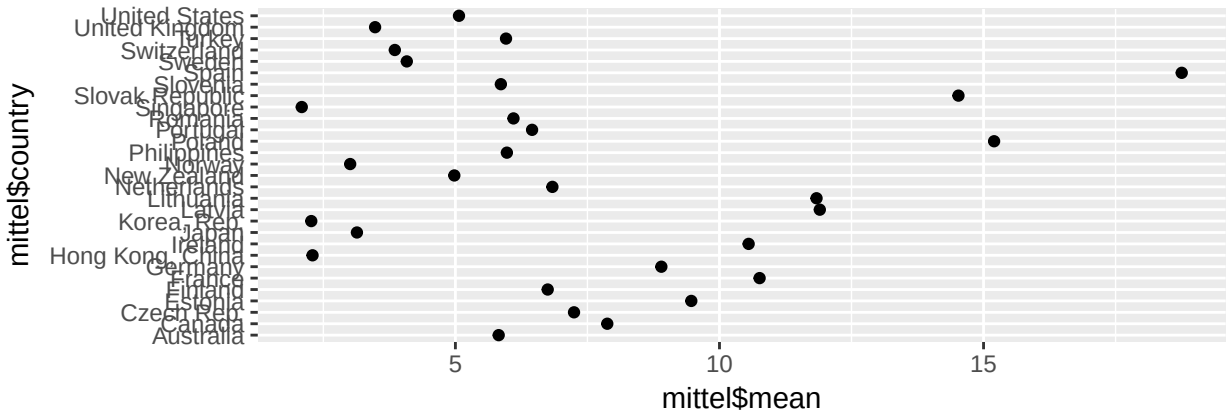
```
ggplot(acountry2, aes(y=country2, x=unemployed))+
  geom_point(stat="identity")
```

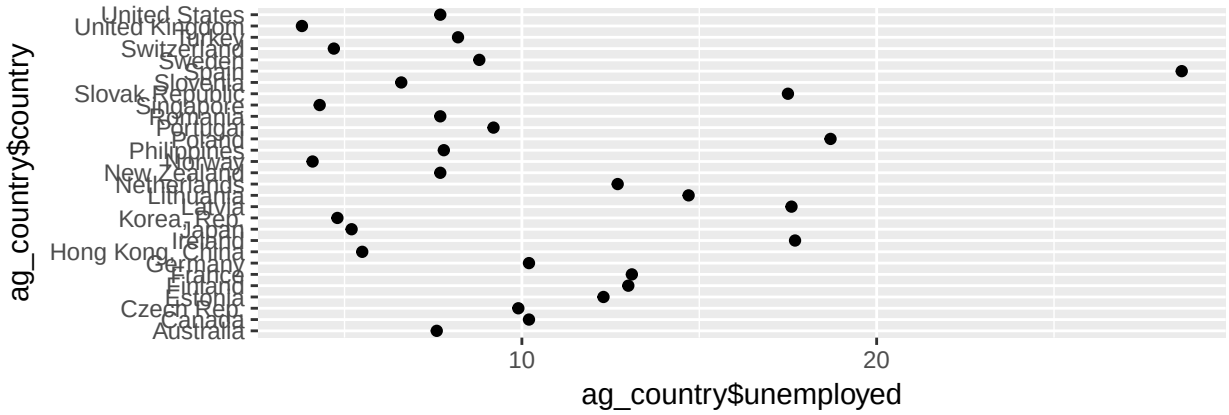
```
## Warning in `levels<-`(`*tmp*`, value = if (nl == nL) as.character(labels)
```

```
## else paste0(labels, : duplicated levels in factors are deprecated

## Warning in `levels<-`(`*tmp*`, value = if (nl == nL) as.character(labels)
## else paste0(labels, : duplicated levels in factors are deprecated
```

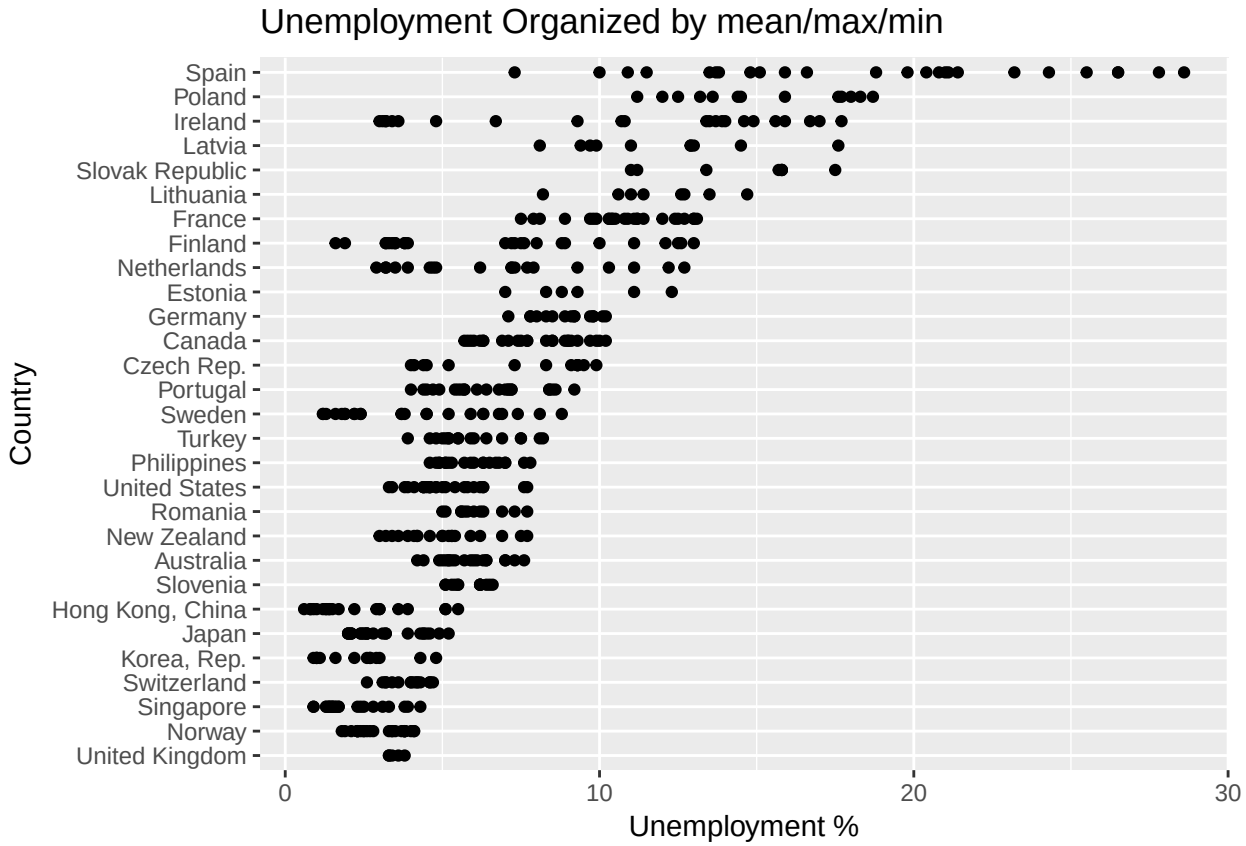



```
mittel <-acountry2 %>% group_by(country) %>%
  summarise(mean=mean(unemployed))

a<-ggplot(mittel, aes(y=mittel$country, x=mittel$mean))+
  geom_point()

ag_country <- aggregate(unemployed ~ country, acountry, max)

b<- ggplot(ag_country, aes(y=ag_country$country,
                           x=ag_country$unemployed))+
  geom_point()

grid.arrange(a,b, nrow=2)
```






```
acountry2$country3 <-factor(
  acountry2$country, levels=ag_country[
    order(ag_country$unemployed), "country"])

ggplot(acountry2, aes(y=country3, x=unemployed))+
  xlab('Unemployment %')+
  ylab('Country')+
  geom_point(stat="identity")+
  ggtitle("Unemployment Organized by mean/max/min")
```


Unemployment Organized by mean/max/min
Spain
Poland
Ireland
Latvia
Slovak Republic
Lithuania
France
Finland
Netherlands
Estonia
Germany
Canada
Czech Rep.
Portugal
Sweden
Turkey
Philippines
United States
Romania
New Zealand
Australia
Slovenia
Hong Kong, China
Japan
Korea, Rep.
Switzerland
Singapore
Norway
United Kingdom
Country
0
10
20
30
Unemployment %