Prob Simulation

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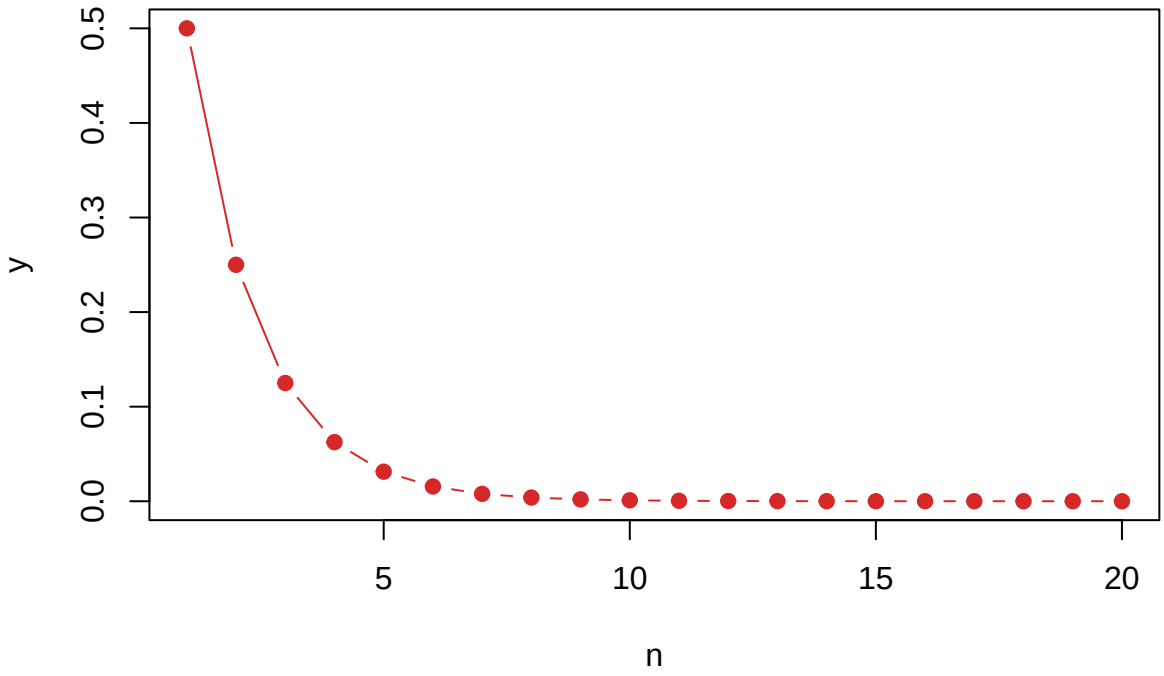
Coin toss

```
size_n <- 100

coin_toss <- sample(c(0,1),size = size_n,replace = TRUE, prob = c(0.5,0.5))

table(coin_toss)
```

```
## coin_toss
##  0  1
## 44 56
```

Coin toss show head probability = p

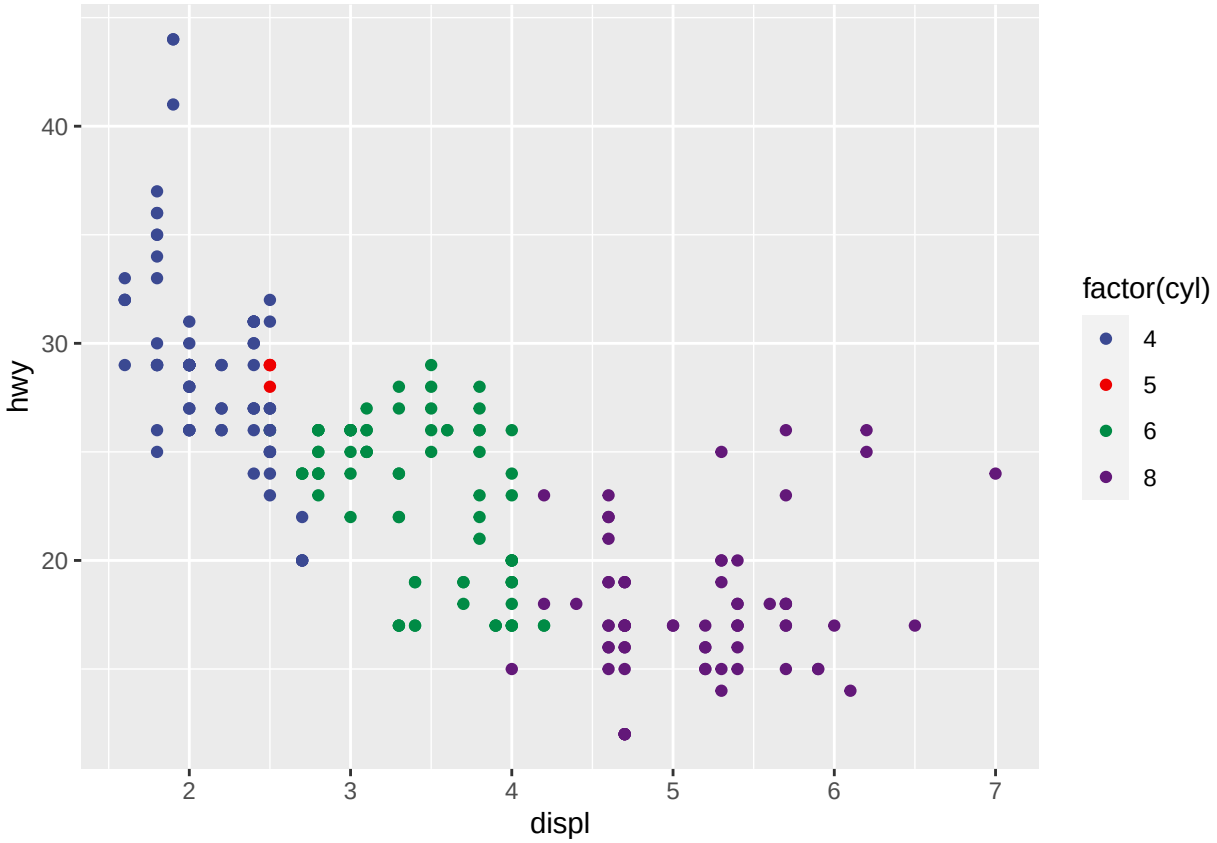
```
p <- 0.5
p1 <- 0.3
n <- seq(1, 20, by = 1)

y <- p * (1 - p)^(n - 1) # Coin toss first time show head calculate each n
y1 <- p1 * (1 - p1)^(n - 1)

plot(n, y, type = "b", pch = 19, col = "#d62828")
```



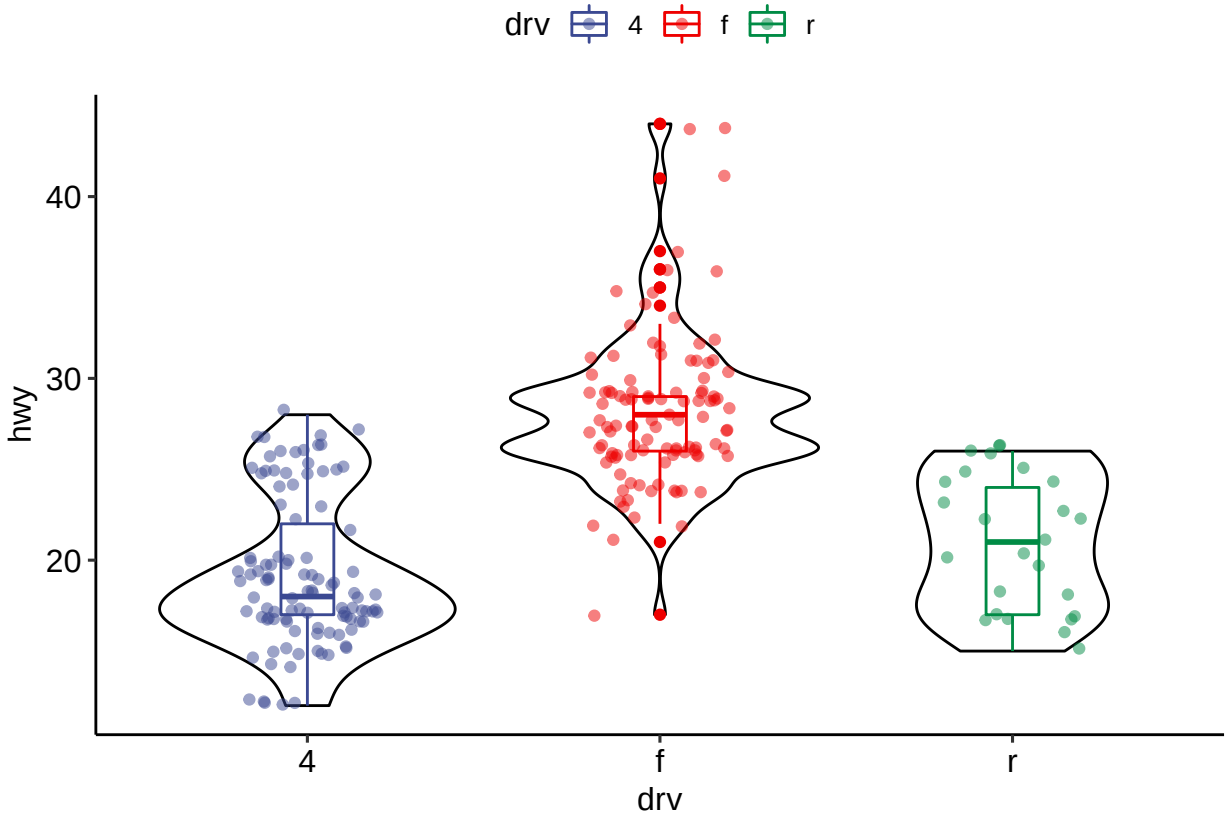

```
library(tidyverse)
library(ggthemes)
library(ggpubr)
library(ggsci)
head(mpg)
```

```
## # A tibble: 6 x 11
##   manufacturer model displ  year   cyl trans      drv     cty   hwy fl    class
##   <chr>        <chr> <dbl> <int> <int> <chr>      <chr> <int> <int> <chr> <chr>
## 1 audi         a4      1.8  1999     4 auto(l5)   f        18    29 p     compa~
## 2 audi         a4      1.8  1999     4 manual(m5) f        21    29 p     compa~
## 3 audi         a4      2    2008     4 manual(m6) f        20    31 p     compa~
## 4 audi         a4      2    2008     4 auto(av)   f        21    30 p     compa~
## 5 audi         a4      2.8  1999     6 auto(l5)   f        16    26 p     compa~
## 6 audi         a4      2.8  1999     6 manual(m5) f        18    26 p     compa~
```

```
ggplot(mpg, aes(x = displ, y = hwy, color = factor(cyl))) +
  geom_point() +
  scale_color_aaas()
```

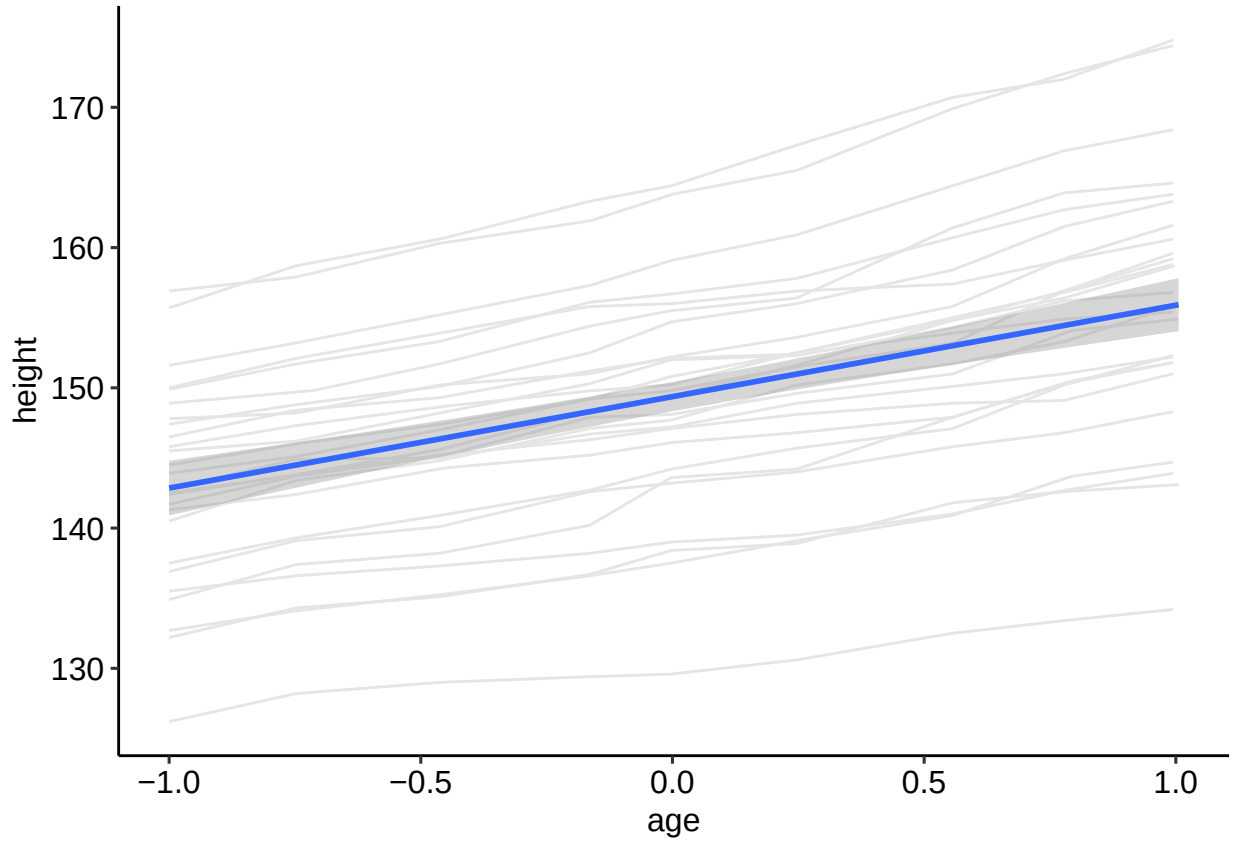



```
ggplot(mpg, aes(drv, hwy, color=drv)) +
  geom_violin(color='black', alpha=0.0)+
  geom_boxplot(width=0.15)+
  geom_jitter(width = 0.2, alpha=0.5)+
  scale_color_aaas()+
  theme_pubr()
```




```
data(Oxboys, package = "nlme")
ggplot(Oxboys, aes(age, height)) +
  geom_line(aes(group = Subject), color = "gray90") +
  geom_smooth(method = "lm", size = 1, se = TRUE) +
  theme_pubr()
```

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



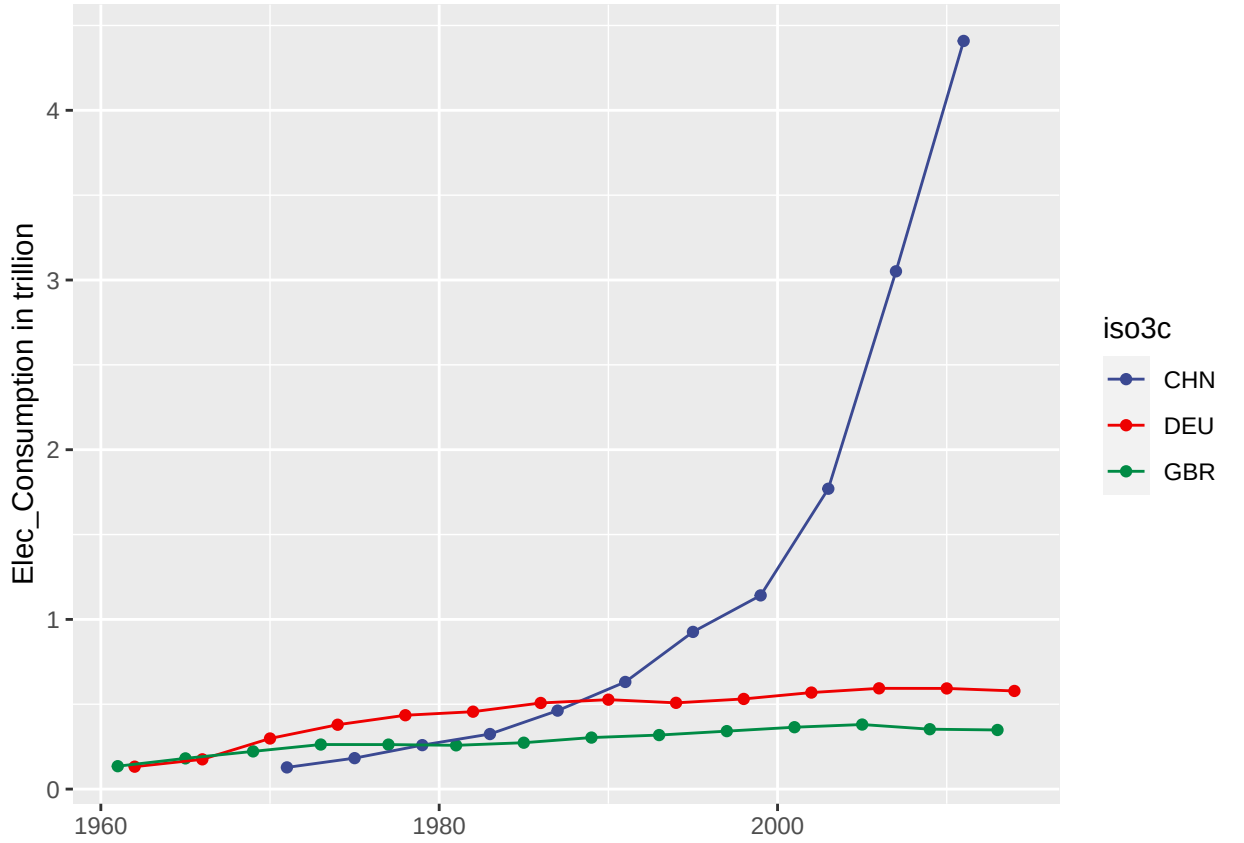

```
technology <- data.table::fread('https://raw.githubusercontent.com/rfordatascience/tidytuesday/master/da
```

```
unique(technology$group)
```

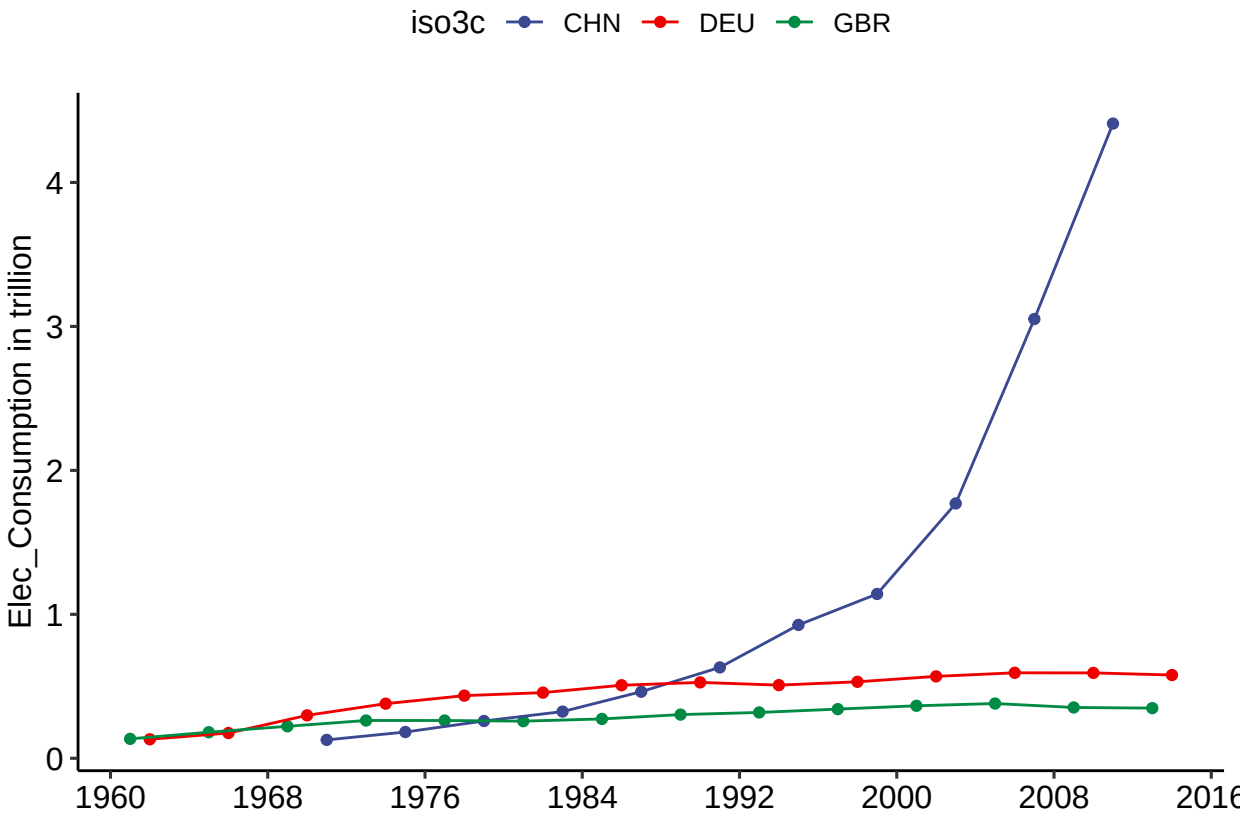
```
## [1] "Consumption" "Production"  "Non-Tech"    "Creation"
```

```
df1 <- technology |> filter(iso3c==c('AFG','CHN','GBR','DEU')) |> filter(variable=='elec_cons')
```

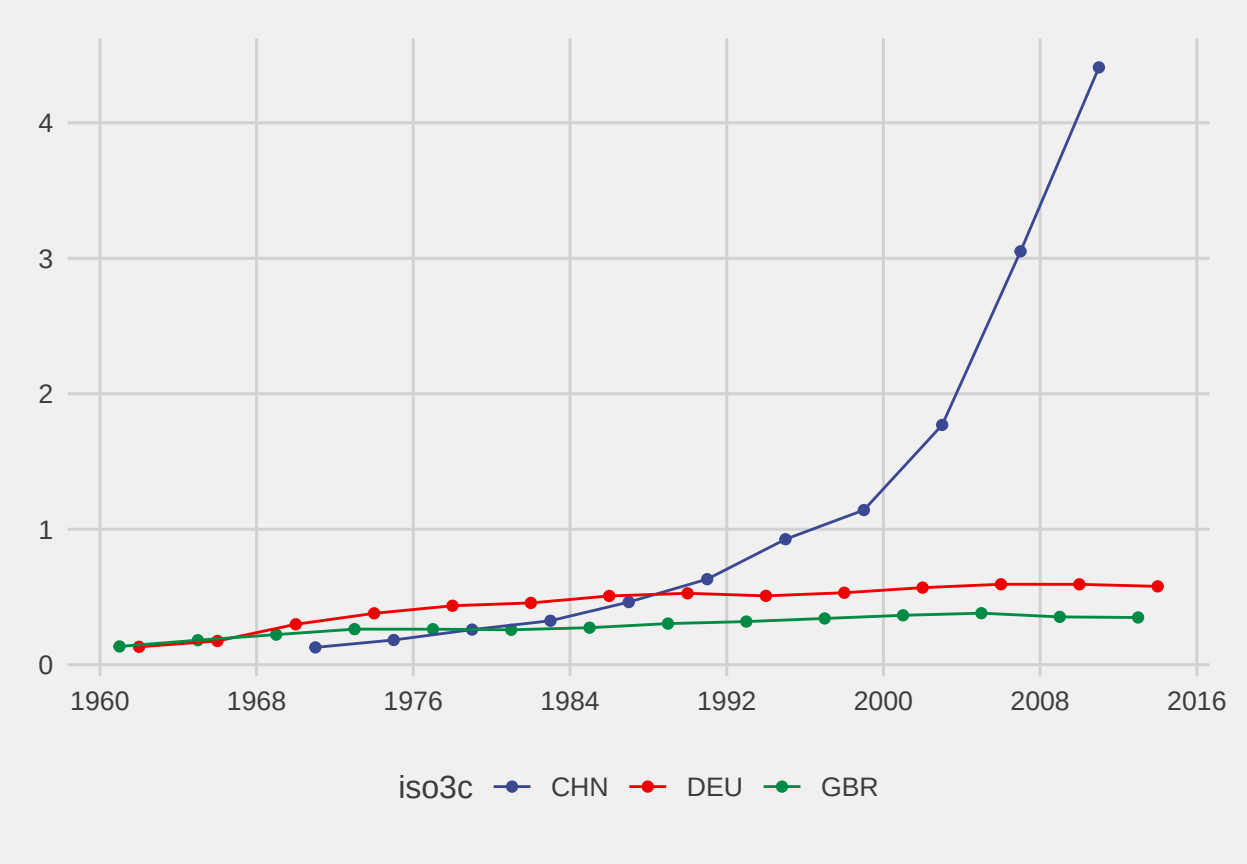
```
plot1 <- ggplot(df1,aes(x = year, y = value/1e12, group = group, color=iso3c))+
            geom_point()+
            geom_line(aes(group=iso3c))+
            labs(y='Elec_Consumption in trillion',
                 x=NULL)+
            scale_color_aaas()
plot1
```



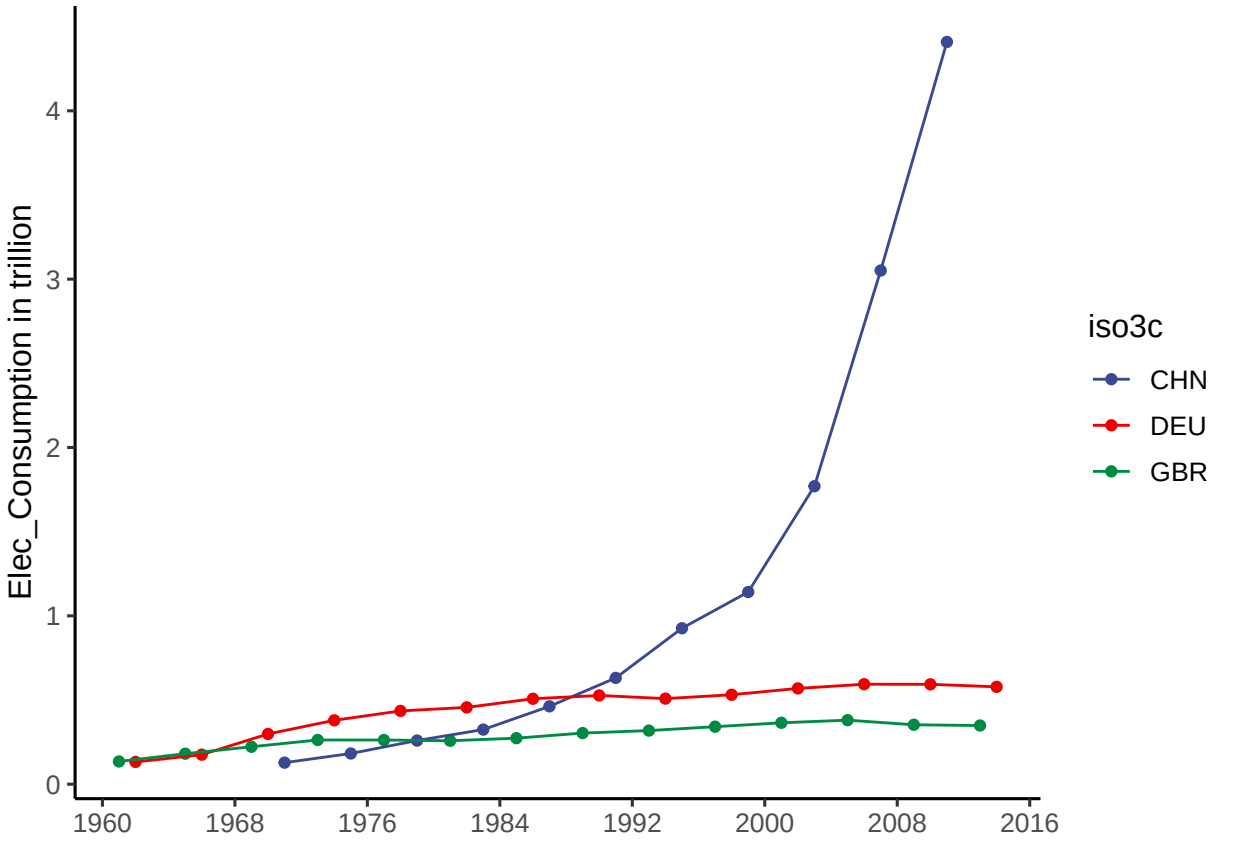

```
plot1 <- plot1 +  scale_x_continuous(breaks=seq(1960,2020,by=8))
plot1+theme_pubr()
```



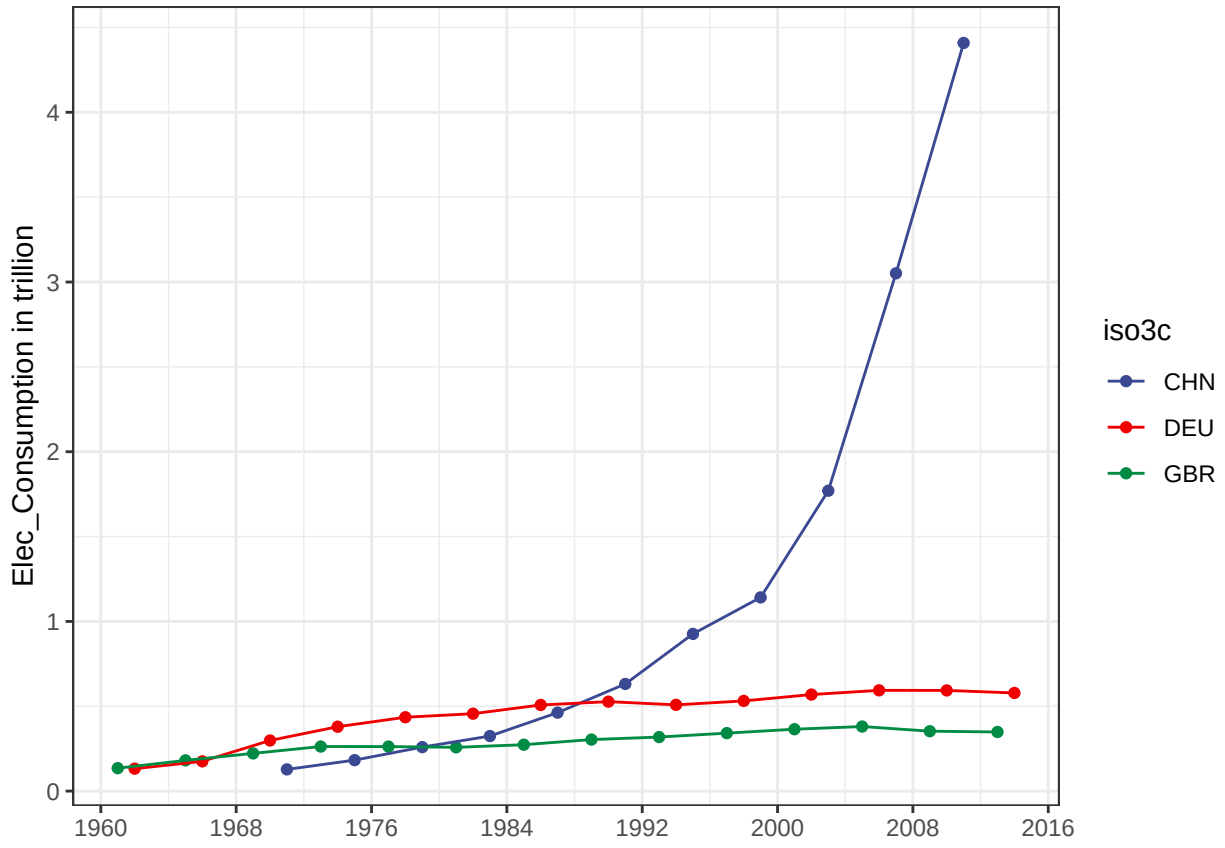

```
plot1+theme_fivethirtyeight()
```




```
plot1+theme_classic2()
```




```
plot1+theme_bw()
```


Elec_Consumption in trillion
0
1
2
3
4
1960
1968
1976
1984
1992
2000
2008
2016
iso3c
CHN
DEU
GBR