

Assignment1.R

Jason

2021-09-12

```
#Assignment 1 Quantitative Management Modeling  
#Data comes from online retail csv from Business Analytics class
```

```
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(lpSolveAPI)
```

```
#demonstrating ability to import data & plot
```

```
WD<-setwd("C:/Users/Jason/Documents/MSBA/Quant")
```

```
OL<-read.csv("Online_Retail.csv", header = TRUE)
```

```
summary(OL)
```

```
##   Row.Labels      Count.of.InvoiceNo  
## Length:39      Min.   :   10.0  
## Class :character 1st Qu.:  136.5  
## Mode  :character Median  :  389.0  
##              Mean   : 27790.2  
##              3rd Qu.: 1389.0  
##              Max.   :541909.0
```

```
#removing grand total
```

```
OL <- OL[-c(39),]
```

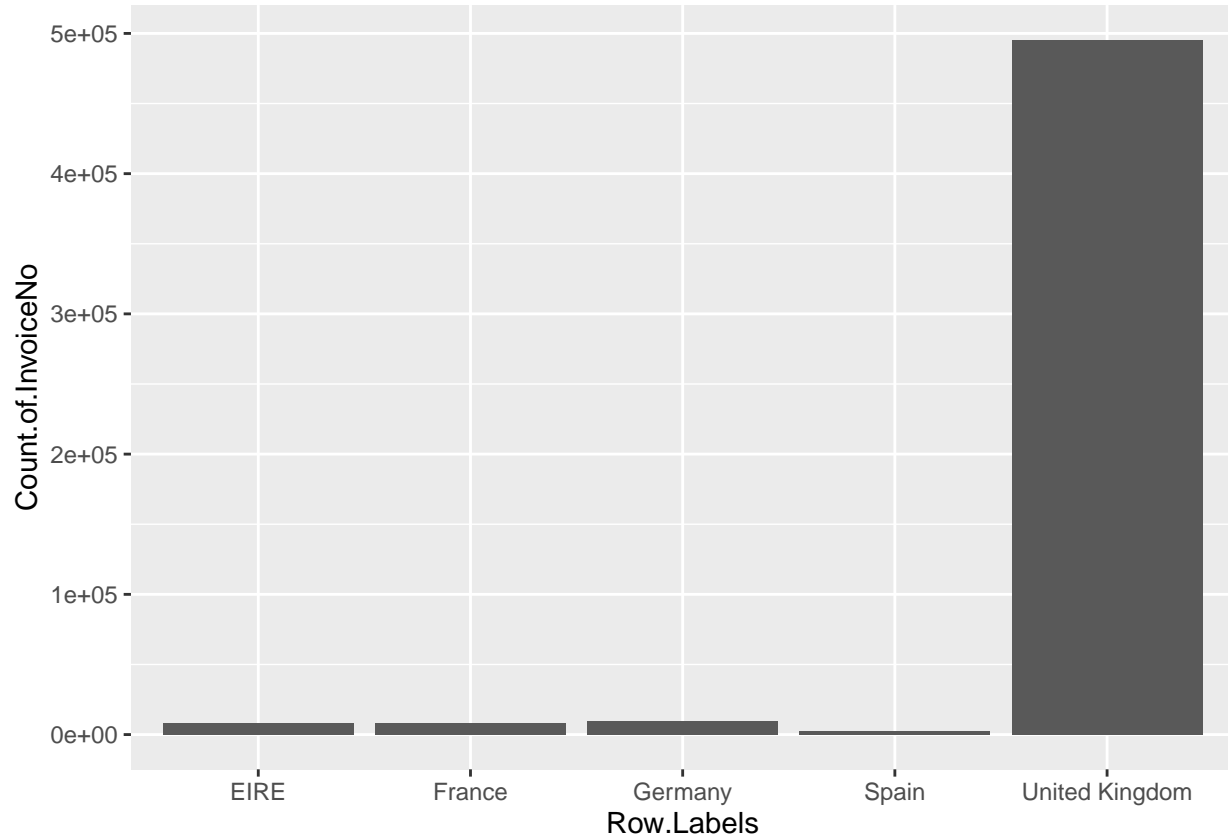
```
#plotting top 5
```

```
OL %>%
```

```

arrange(desc(Count.of.InvoiceNo)) %>%
slice(1:5) %>%
ggplot(., aes(x=Row.Labels, y=Count.of.InvoiceNo))+
geom_bar(stat='identity')

```



```
#####
```

```
#back savers problem
```

```
#back savers has 2 products: Collegiate & Mini
```

```
#back savers receives 5000 square feet of nylon per week
```

```
# Each Collegiate requires 3 square feet of nylon & 45 minutes of labor
```

```
# Each Mini requires 2 square feet of nylon & 40 minutes of labor
```

```
# back savers has 35 laborers at 40 hours per week
```

```
# 1000 Collegiate max & 1200 mini max
```

```
#converting 40 hours/week to minutes per week
```

```
#multiplying by 35 for each employee
```

```
AvailableLabor <- 40*60*35
```

```
AvailableLabor
```

```
## [1] 84000
```

```
#labor is the only unit that needs to be normalized
#Nylon available & nylon required per product are both in square feet

# X = Collegiate
# Z = Mini
#Labor Constraint =  $45X + 40Z \leq 84,000$ 
#Nylon Constraint =  $3X + 2Z \leq 5,000$ 
#Product Constraint  $X \leq 1000$ 
#Product Constraint  $Z \leq 1,200$ 
#Objective Function =  $32X + 24Z$ 
```