STAT F611 Homework 01

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1.1 The scatterplot of LA rainfall versus last year's LA rainfall is presented in Figure 1.

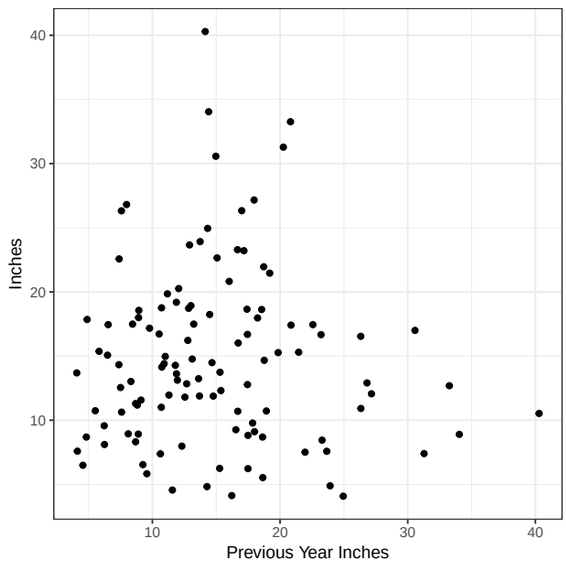


Figure 1: Scatterplot of LA Rainfall versus Last Year's LA Rainfall

Code

```
data(larain)
data<-data.frame(y=larain, x=zlag(larain))
p.larain <- ggplot(data = data, mapping = aes(x,y))+
  geom_point()+
  theme_bw()+
  xlab("Previous Year Inches")+
  ylab("Inches")
```

1.2 The time series plot of color property from a chemical process is presented in Figure 2.

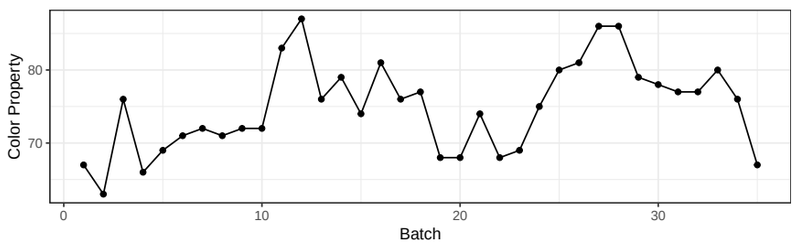
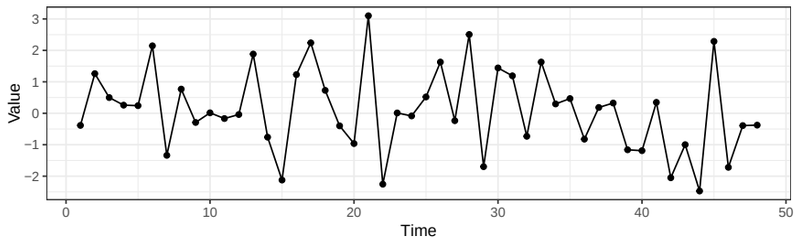


Figure 2: Time Series Plot of Color Property from a Chemical Process

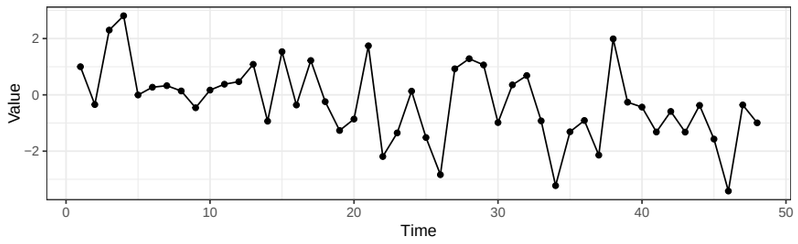
Code

```
data(color)
data<-data.frame(y=color, x= c(1:length(color)))
p.color <- ggplot(data = data, mapping = aes(x,y))+
  geom_line()+
  geom_point()+
  theme_bw()+
  xlab("Batch")+
  ylab("Color Property")
```

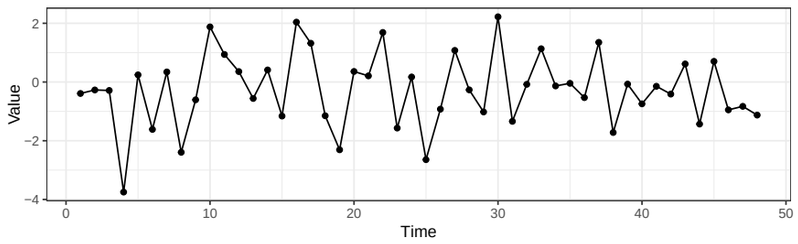
1.5 Three time series plots of 48 random t-distributed values (df = 5) are presented in Figure 3. All three plots look "random" since the values appear to fluctuate without any pattern and they look nothing normal.



(a) Random Sample 1



(b) Random Sample 2



(c) Random Sample 3

Figure 3: Time Series Plots of 48 Random t-Distributed Values (df = 5)

Code

```
n <- 48
df <- 5
tdata <- rt(n, df)
data <- data.frame(y=tdata, x= c(1:length(tdata)))
p.t <- ggplot(data = data, mapping = aes(x,y))+
  geom_line()+
  geom_point()+
  theme_bw()+
  xlab("Time")+
  ylab("Value")
```

1.6 The time series plot of the average monthly temperatures of Dubuque, Iowa is presented in Figure 4.

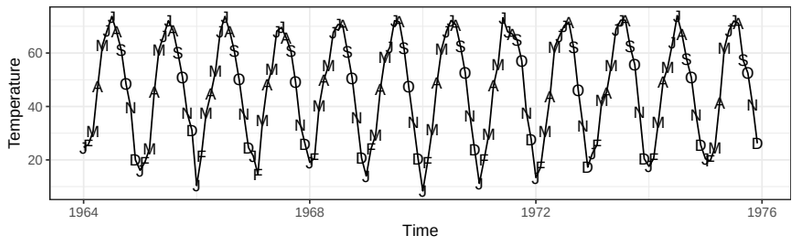


Figure 4: Time Series Plot of Average Monthly Temperatures, Dubuque, Iowa

Code

```
data(tempdub)
data<-data.frame(y=tempdub, x=time(tempdub), s=as.vector(substr(season(tempdub),1,1)))
p.temdub <- ggplot(data = data, mapping = aes(x,y))+
  geom_line()+
  geom_text(aes(label=s))+
  theme_bw()+
  xlab("Time")+
  ylab("Temperature")
```