A Blog Thing

Toni Anderson

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Initial Climate Data

```
##Read CSV Data
filepath= "/home/CAMPUS/ttab2018/Climate_Change_Narratives/student_folders/Anderson/tonianderson_burban
climate_data = read.csv(filepath)
head(climate_data)
```

```
##       STATION                                NAME      DATE PRCP SNOW SNWD
## 1 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/1/1939    0    0    0
## 2 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/2/1939    0    0    0
## 3 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/3/1939    0    0    0
## 4 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/4/1939    0    0    0
## 5 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/5/1939    0    0    0
## 6 USC00041194 BURBANK VALLEY PUMP PLANT, CA US 12/6/1939    0    0    0
##   TMAX TMIN TOBS
## 1 28.9  4.4   NA
## 2 28.3  8.9   NA
## 3 31.7  7.2   NA
## 4 31.1  6.7   NA
## 5 26.7  7.8   NA
## 6 24.4 12.2   NA
```

```
str(climate_data)
```

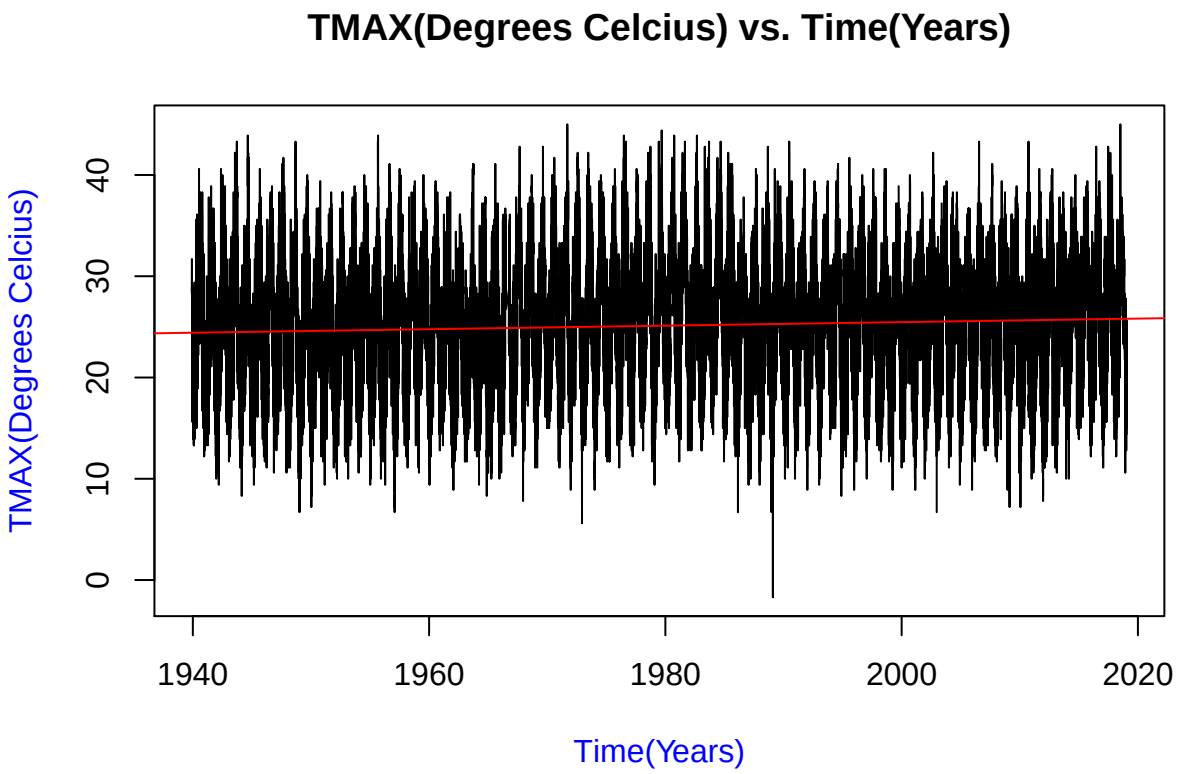
```
## 'data.frame':    28601 obs. of  9 variables:
##  $ STATION: Factor w/ 1 level "USC00041194": 1 1 1 1 1 1 1 1 1 1 ...
##  $ NAME   : Factor w/ 1 level "BURBANK VALLEY PUMP PLANT, CA US": 1 1 1 1 1 1 1 1 1 1 ...
##  $ DATE   : Factor w/ 28601 levels "1/1/1940","1/1/1941",..: 7201 8081 8961 9201 9281 9361 9441 9521
##  $ PRCP   : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ SNOW   : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ SNWD   : int  0 0 0 0 0 0 0 0 0 0 ...
##  $ TMAX   : num  28.9 28.3 31.7 31.1 26.7 24.4 25 21.7 21.1 21.7 ...
##  $ TMIN   : num  4.4 8.9 7.2 6.7 7.8 12.2 7.2 8.3 8.9 5.6 ...
##  $ TOBS   : num  NA NA NA NA NA NA NA NA NA NA ...
```

```
names(climate_data)
```

```
## [1] "STATION" "NAME"    "DATE"    "PRCP"    "SNOW"    "SNWD"    "TMAX"
## [8] "TMIN"    "TOBS"
```

```
##Fix Dates
strDates <- as.character(climate_data$DATE)
climate_data$NewDate <- as.Date(strDates, "%m/%d/%Y")

##Plot Data
plot(TMAX~NewDate, climate_data, ty='l', main="TMAX(Degrees Celcius) vs. Time(Years)", xlab="Time(Years
c <- coef(lm(TMAX~NewDate, climate_data))
abline(c, col="red")
```



Monthly Data Max and Mins

```
## Define Shit
lm(TMAX~NewDate, data=climate_data)
```

```
##
## Call:
## lm(formula = TMAX ~ NewDate, data = climate_data)
##
## Coefficients:
## (Intercept)      NewDate
##   2.495e+01    4.773e-05
```

```
summary(lm(TMAX~NewDate, data=climate_data))
```

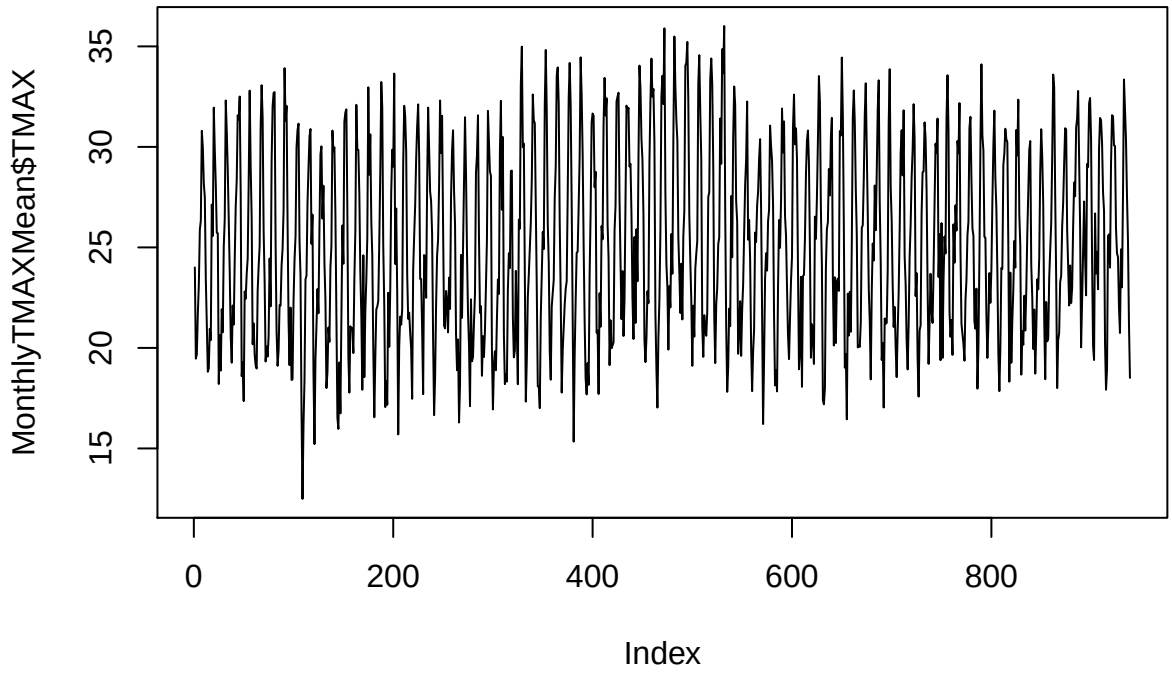
```
##
## Call:
## lm(formula = TMAX ~ NewDate, data = climate_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -26.9787  -4.6118  -0.1055   4.4729  20.0247
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept) 2.495e+01  4.008e-02  622.32   <2e-16 ***
## NewDate     4.773e-05  4.436e-06   10.76   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.259 on 28505 degrees of freedom
##   (94 observations deleted due to missingness)
## Multiple R-squared:  0.004045,   Adjusted R-squared:  0.00401
## F-statistic: 115.8 on 1 and 28505 DF,  p-value: < 2.2e-16
```

```
##Monthly Averages
climate_data$Month = format(as.Date(climate_data$NewDate), format="%m")
climate_data$Year = format(as.Date(climate_data$NewDate), format="%Y")
MonthlyTMAXMean = aggregate(TMAX ~ Month +Year, climate_data, mean)
MonthlyTMAXMean$YEAR = as.numeric(MonthlyTMAXMean$Year)
MonthlyTMAXMean$MONTH = as.numeric(MonthlyTMAXMean$Month)
str(MonthlyTMAXMean)
```

```
## 'data.frame':    939 obs. of  5 variables:
##  $ Month: chr  "12" "01" "02" "03" ...
##  $ Year : chr  "1939" "1940" "1940" "1940" ...
##  $ TMAX : num  24 19.5 19.7 21.7 23.1 ...
##  $ YEAR : num  1939 1940 1940 1940 1940 ...
##  $ MONTH: num  12 1 2 3 4 5 6 7 8 9 ...
```

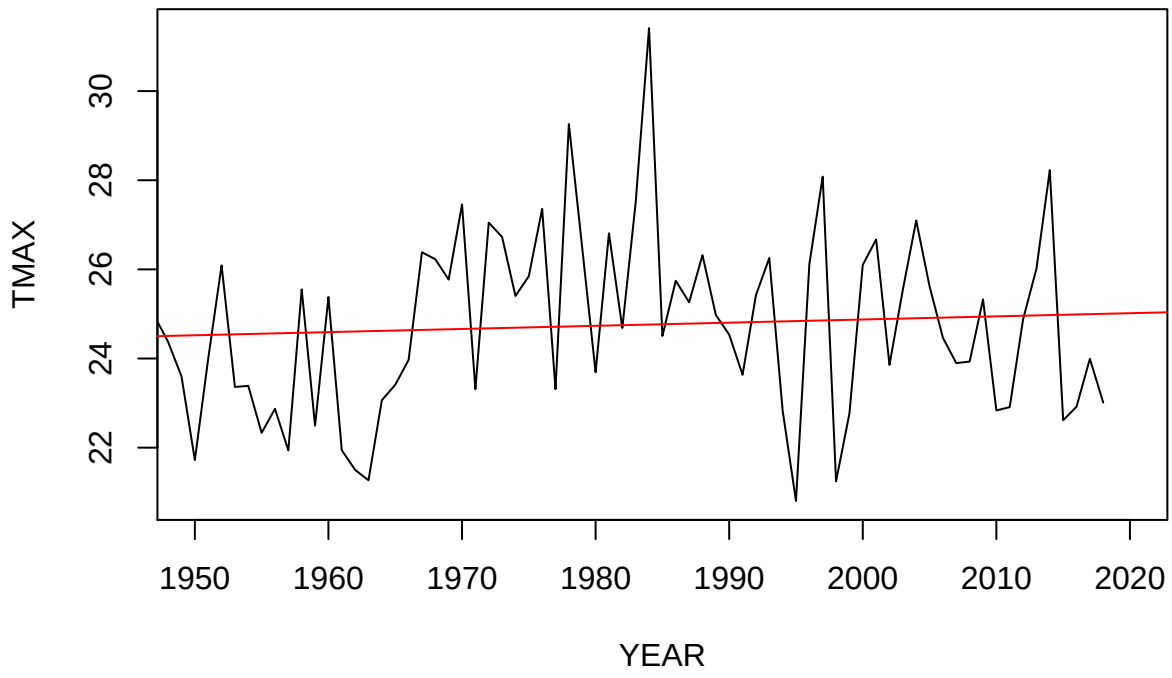
```
plot(MonthlyTMAXMean$TMAX, ty='l')
```



```r
##Plot May
plot(TMAX~YEAR, data=MonthlyTMAXMean[MonthlyTMAXMean$Month=="05",], ty='l', xlim=c(1950, 2020))
May.lm <- lm(TMAX~YEAR, data=MonthlyTMAXMean[MonthlyTMAXMean$Month=="05",])
summary(May.lm)
```

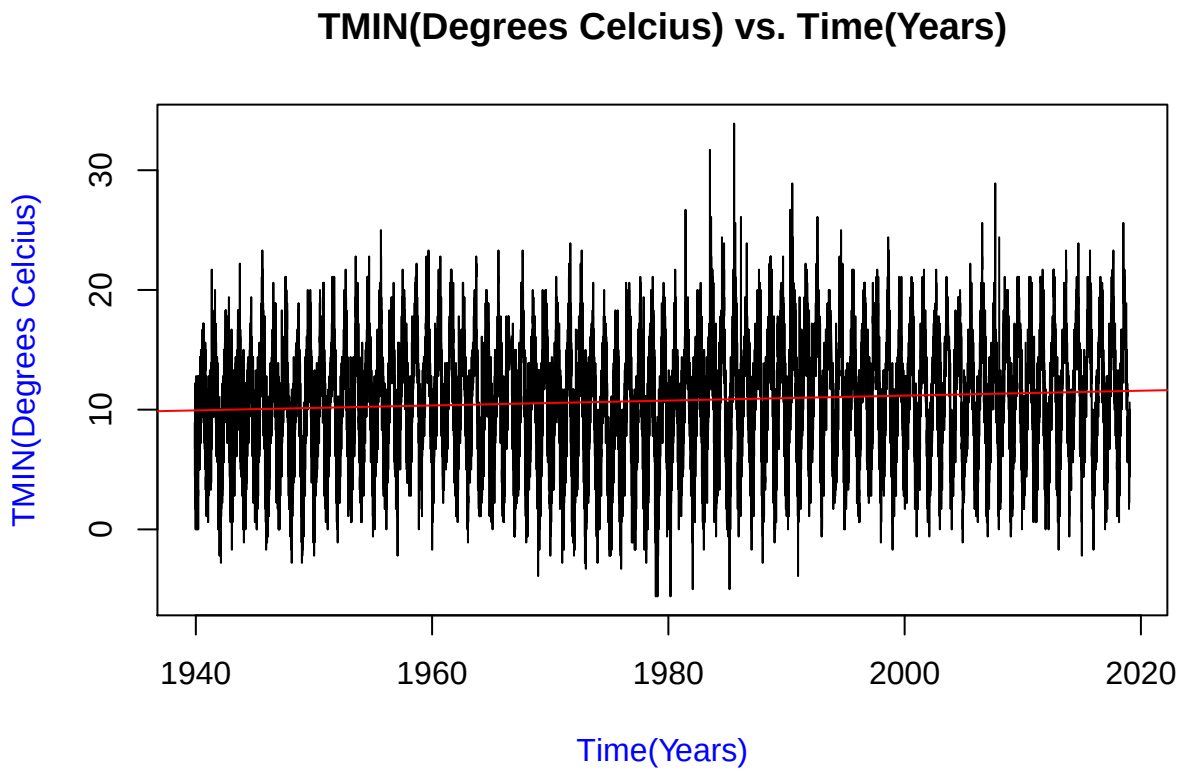
```
##
## Call:
## lm(formula = TMAX ~ YEAR, data = MonthlyTMAXMean[MonthlyTMAXMean$Month ==
##     "05", ])
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.0368 -1.3899 -0.1081  1.3882  6.6507
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 10.727110  19.761566   0.543    0.589
## YEAR         0.007074   0.009985   0.708    0.481
##
## Residual standard error: 2.024 on 76 degrees of freedom
## Multiple R-squared:  0.006561,   Adjusted R-squared:  -0.00651
## F-statistic: 0.5019 on 1 and 76 DF,  p-value: 0.4808
```

```r
abline(coef(May.lm), col="red")
```




```r
##TMIN Definitions
plot(TMIN~NewDate, climate_data, ty='l', main="TMIN(Degrees Celcius) vs. Time(Years)", xlab="Time(Years
```

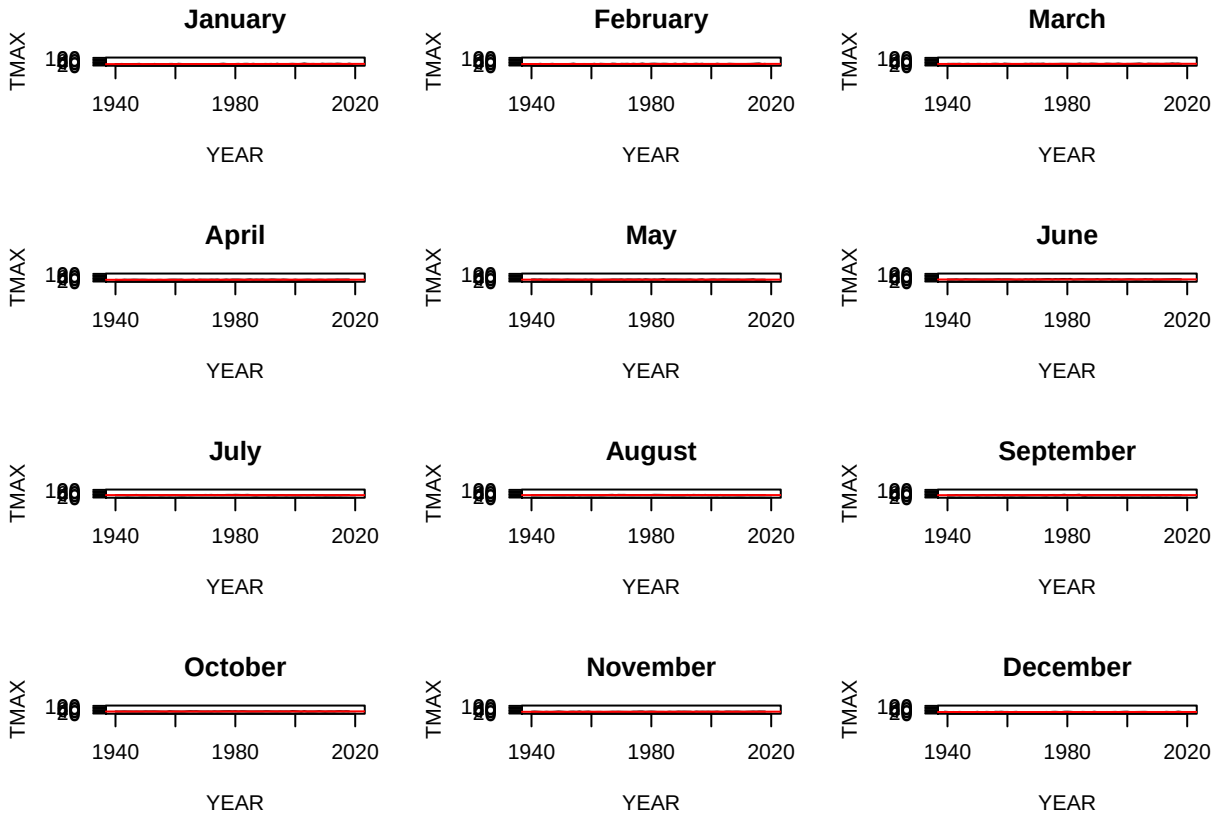
```
c <- coef(lm(TMIN~NewDate, climate_data))
abline(c, col="red")
```



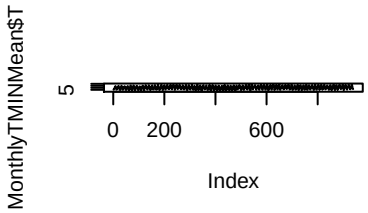

```
MonthlyTMINMean = aggregate(TMIN ~ Month +Year, climate_data, mean)
MonthlyTMINMean$YEAR = as.numeric(MonthlyTMINMean$Year)
MonthlyTMINMean$MONTH = as.numeric(MonthlyTMINMean$Month)
head(MonthlyTMINMean)
```

```
##   Month Year      TMIN YEAR MONTH
## 1    12 1939  5.677419 1939    12
## 2    01 1940  6.225806 1940     1
## 3    02 1940  5.972414 1940     2
## 4    03 1940  7.790323 1940     3
## 5    04 1940  9.120000 1940     4
## 6    05 1940 11.454839 1940     5
```

```
##Every Month! Come back and do 1 by 1
Months = c("January", "February", "March", "April", "May", "June", "July", "August", "September", "Octo
par(mfrow = c(4, 3), mar = c(5, 4, 3, 2) + 0.1 )
TMAXresult <- NA
for (i in 1:12) {
  plot(TMAX ~ YEAR, data =  MonthlyTMAXMean[MonthlyTMAXMean$MONTH == i, ], ty = "l", las = 1, xlim = c(
Month.lm <- lm(TMAX ~ YEAR, data = MonthlyTMAXMean[MonthlyTMAXMean$MONTH == i, ])
summary(Month.lm)
abline(coef(Month.lm), col = "red")
TMAXresult <- rbind(TMAXresult, cbind(Months[i], round(coef(Month.lm)[2], 4), round(summary(Month.lm)$c
}
```




```
##Daily Mins
plot(MonthlyTMINMean$TMIN, ty='l')
```



“‘

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.