Time Series: Homework 4

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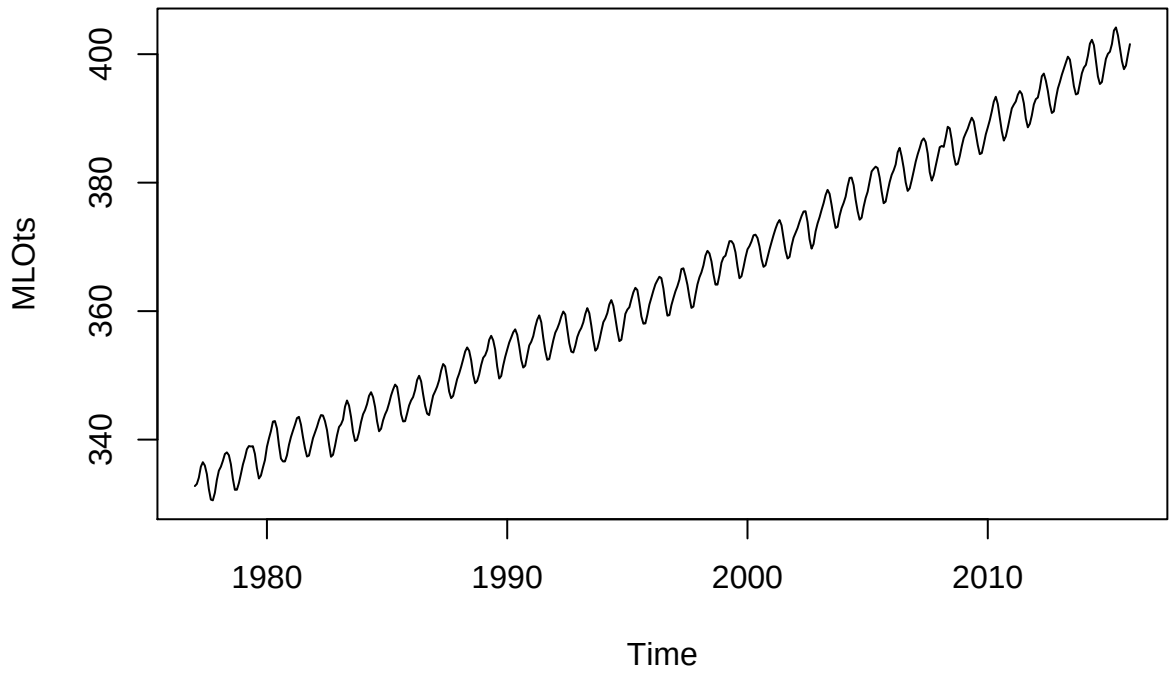
```
MLO_flask<-read.csv("https://dl.dropboxusercontent.com/u/77307195/MLO_flask.csv",header=T)
table(MLO_flask$year) #Great way to see how many observations you have per year
```

```
##
## 1969 1970 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
##    5   12    6   12   12   12   12   12   12   12   12   12   12   12   12
## 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003
##   12   12   12   12   12   12   12   12   12   12   12   12   12   12   12
## 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
##   12   12   12   12   12   12   12   12   12   12   12   12
```

```
MLO_flaskR<-subset(MLO_flask,year>1976)
MLOts<-ts(MLO_flaskR$value,start=c(1977,1),freq=12) #Only use this if any missing values coded as NAs o
plot(MLOts)
```



Report all R code either inline or in an appendix.

1) *Provide a reason for your choice of location. Report any missing observations and the range of years where you are modeling. We chose a location in Australia (CGO) called Cape Grim, which is the northern-most point of Tasmania. According to the station's website (managed by Massachussetts Institute of Technology), the station there is located in the path of large air masses that settle over Antarctica and the Southern Ocean that surrounds it; thus, measurements taken there tend to give some information about CO2 concentrations in less accessible places such as the South Pole. The dataset contains observations over a 21 year period from 1984 to 2015. Thankfully, there were no missing observations in the dataset.*

2) *Make a nice looking time series plot of the CO_2 concentrations.*

3) *Fit a linear trend plus seasonal means model to the data. Report and discuss the four panel residual diagnostics. Also make a plot of residuals vs time and discuss any potential missed pattern versus time.*

4) *Provide tests for the linear and seasonal means components, conditional on each other. Report those results in two sentences including all details.*

5) *For your model, plot the original time series and the model fitted values, both versus time on the same plot. You might consider two line types or colors for the two lines. The easiest way to obtain fitted values in R is using fitted(modelname). Discuss how it appears your model does or does not describe the responses using this plot.*

6) *Document your R version.*

```
getRversion()
```

```
## [1] '3.3.1'
```

```
sessionInfo()$R.version$nickname
```

```
## [1] "Bug in Your Hair"
```