Complete the following exercise in R Markdown and render it as pdf, you are required to submit your .Rmd and the rendered pdf file. Use the right packages as needed.

Task 1

The weather.csv file attached contains monthly average horizontal solar radiation and monthly precipitation series taken at same time points from January 1960 to December 2014. Do the following for each of the series.

1. Plot a line charts of the solar and ppt variables against an index. Comment on the charts
2. Without doing any calculations, do you think these weather elements are correlated?
3. Compute the correlation coefficient and comment on the value.
4. Convert the variables to time series objects and plot the time series in separate charts. Ensure that you label data points over the plot (First letter of the month is enough)
    a. Can you infer seasonality from observing the plot? Explain.
    b. Can you infer existence of a trend? Explain
5. Test for stationarity using Dickey-Fuller and Phillips-Perron tests and comment on the results. Make sure you state the null and the alternative hypotheses.
6. Plot the ACF and PACF and interpret the results.
7. Carry out ordinary differencing up to 2nd order plotting the series after each level and comment on what you see.
8. Carry out seasonal differencing and plot the series. Comment on the chart.

Task 2

ASX_data.xls has monthly average prices of asx, gold, crude oil and copper starting from January 2004.

1. Conduct correlation analysis (create a correlation plot).
    a. Explain the correlation coefficients.
    b. Which two assets have strong correlation? Remove them from the analysis going forward.
2. Assess the data for the remaining assets using time series plots, ACF PACF plots and statistical tests as in task 1.
3. For each of the two series, fit an ARIMA model using Box-Jenkins methodology. Use AIC to choose the values of p and q.