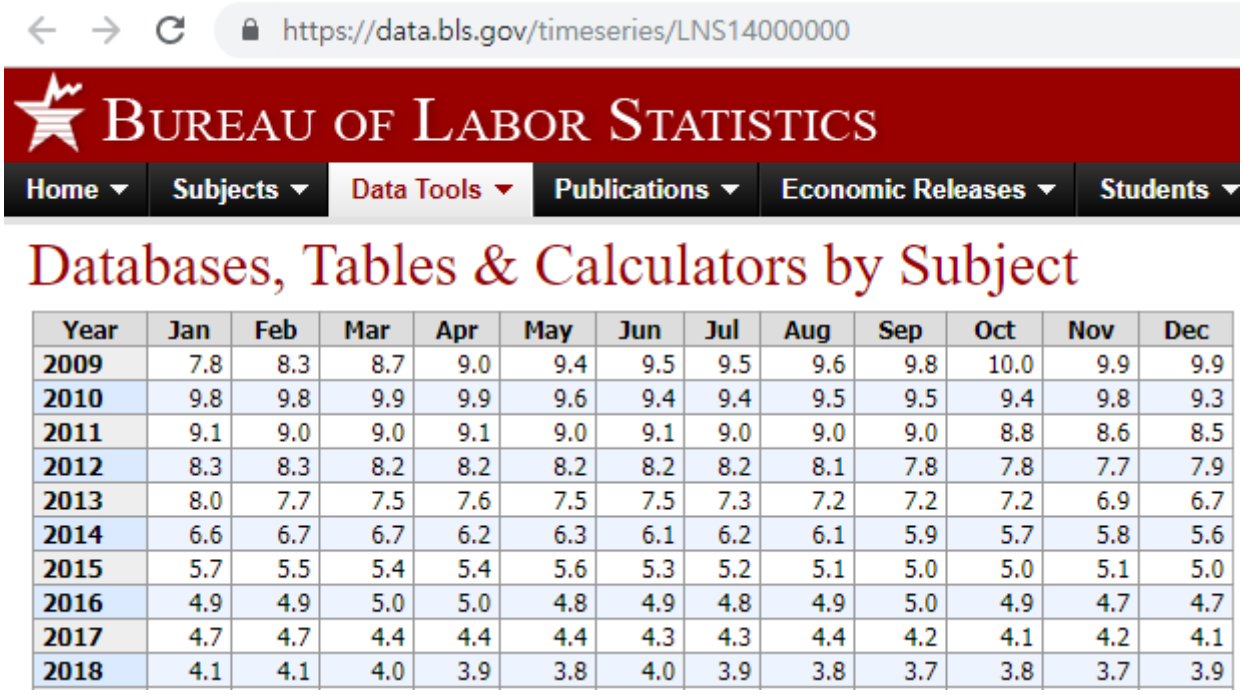
Exercises

1. Monthly “unemployment rates” data was collected from the Bureau of Labor Statistics. (1) Create the time series for the unemployment rates. (2) Plot the “unemployment rates” time series data. This data is included in 20RScript.R. Make the data as time series with *ts()* function. (3) Determine if the time series is stationary via *acf()* and *kpss.test()*. (4) Decompose the “unemployment rates” time series data and plot only random component. (5) Forecast the unemployment ratio in 2019 year using Holt-Winters model. Set level=c(90,95).



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	7.8	8.3	8.7	9.0	9.4	9.5	9.5	9.6	9.8	10.0	9.9	9.9
2010	9.8	9.8	9.9	9.9	9.6	9.4	9.4	9.5	9.5	9.4	9.8	9.3
2011	9.1	9.0	9.0	9.1	9.0	9.1	9.0	9.0	9.0	8.8	8.6	8.5
2012	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.1	7.8	7.8	7.7	7.9
2013	8.0	7.7	7.5	7.6	7.5	7.5	7.3	7.2	7.2	7.2	6.9	6.7
2014	6.6	6.7	6.7	6.2	6.3	6.1	6.2	6.1	5.9	5.7	5.8	5.6
2015	5.7	5.5	5.4	5.4	5.6	5.3	5.2	5.1	5.0	5.0	5.1	5.0
2016	4.9	4.9	5.0	5.0	4.8	4.9	4.8	4.9	5.0	4.9	4.7	4.7
2017	4.7	4.7	4.4	4.4	4.4	4.3	4.3	4.4	4.2	4.1	4.2	4.1
2018	4.1	4.1	4.0	3.9	3.8	4.0	3.9	3.8	3.7	3.8	3.7	3.9