Test Exercise 6

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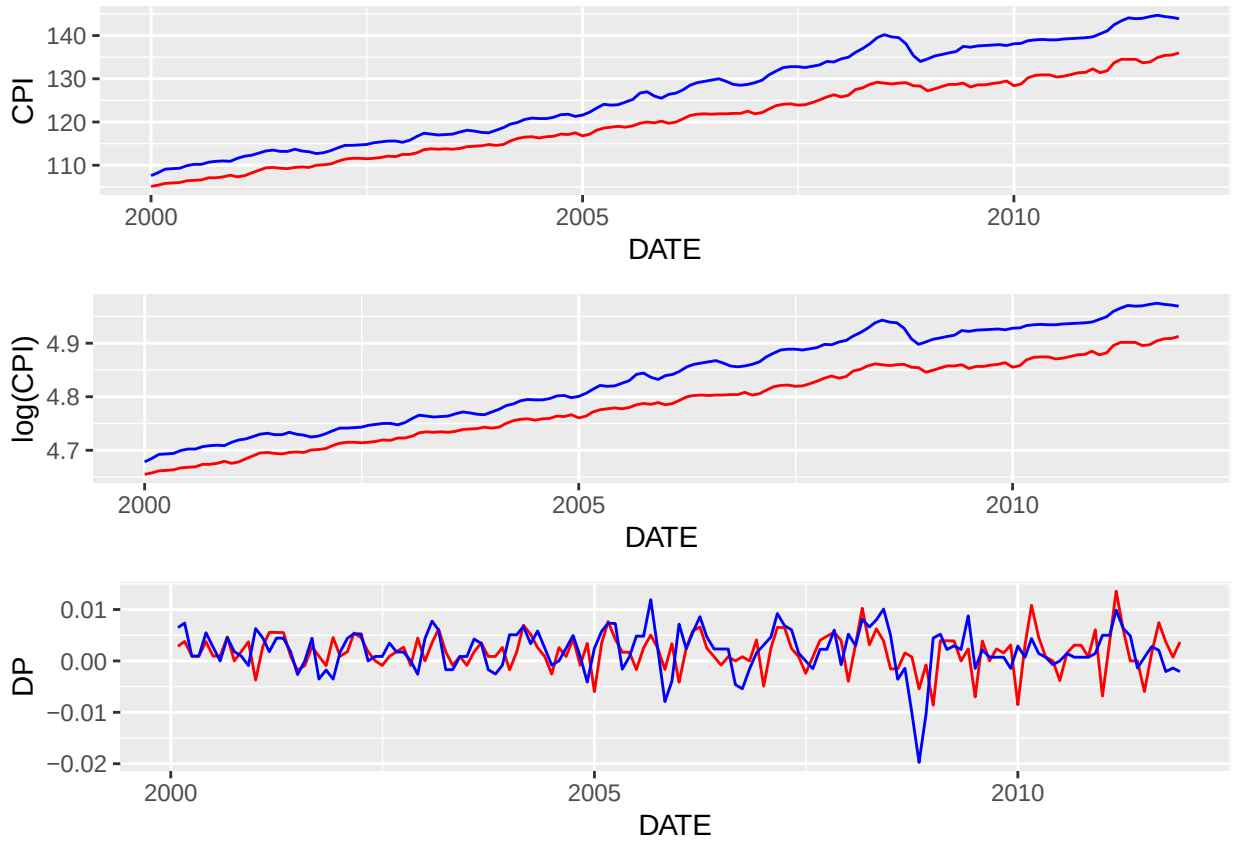
a)



In the above plot we can see an increasing trend for both CPI as expected given the inflation of prices. Both prices are high correlated and by the last plot it seems stationary.

b)

```
##
##  Augmented Dickey-Fuller Test
##
## data:  cpi$LOGPEUR
## Dickey-Fuller = -2.8263, Lag order = 3, p-value = 0.2324
## alternative hypothesis: stationary
```

```
##
##  Augmented Dickey-Fuller Test
##
## data:  cpi$LOGPUSA
## Dickey-Fuller = -2.7345, Lag order = 3, p-value = 0.2706
## alternative hypothesis: stationary
```

For both tests we got a high p-value so we failed to reject the null hypothesis, it is, non-stationary.

c)

```
##
## Time series regression with "ts" data:
## Start = 14, End = 144
##
## Call:
## dynlm(formula = ts(DPEUR) ~ L(ts(DPEUR, 6)) + L(ts(DPEUR, 12)),
##     data = cpi)
##
## Residuals:
##        Min         1Q     Median         3Q        Max
## -0.0106987 -0.0016514 -0.0001211  0.0014451  0.0079469
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)      0.0002776  0.0002610   1.064  0.28954
## L(ts(DPEUR, 6))  0.2070482  0.0693459   2.986  0.00339 **
## L(ts(DPEUR, 12)) 0.6618626  0.0748732   8.840 6.42e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.002535 on 128 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.507,  Adjusted R-squared:  0.4993
## F-statistic: 65.81 on 2 and 128 DF,  p-value: < 2.2e-16
```

d)

```
##
## Time series regression with "ts" data:
## Start = 14, End = 144
##
## Call:
## dynlm(formula = ts(DPEUR) ~ L(ts(DPEUR, 6)) + L(ts(DPEUR, 12)) +
##     L(ts(DPUSA, 1)) + L(ts(DPUSA, 6)) + L(ts(DPUSA, 12)), data = cpi)
##
## Residuals:
##        Min         1Q     Median         3Q        Max
## -0.0069414 -0.0016374 -0.0000405  0.0011089  0.0081291
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)       0.0003462  0.0002719   1.273  0.20527
```

```
## L(ts(DPEUR, 6))   0.2032964  0.0707234   2.875  0.00476 **
## L(ts(DPEUR, 12))  0.6995076  0.0773015   9.049 2.36e-15 ***
## L(ts(DPUSA, 1))   0.2195443  0.0489174   4.488 1.61e-05 ***
## L(ts(DPUSA, 6))  -0.0484667  0.0531548  -0.912  0.36363
## L(ts(DPUSA, 12)) -0.2355513  0.0525563  -4.482 1.65e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.002251 on 125 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.6202, Adjusted R-squared:  0.6051
## F-statistic: 40.83 on 5 and 125 DF,  p-value: < 2.2e-16
```

e)