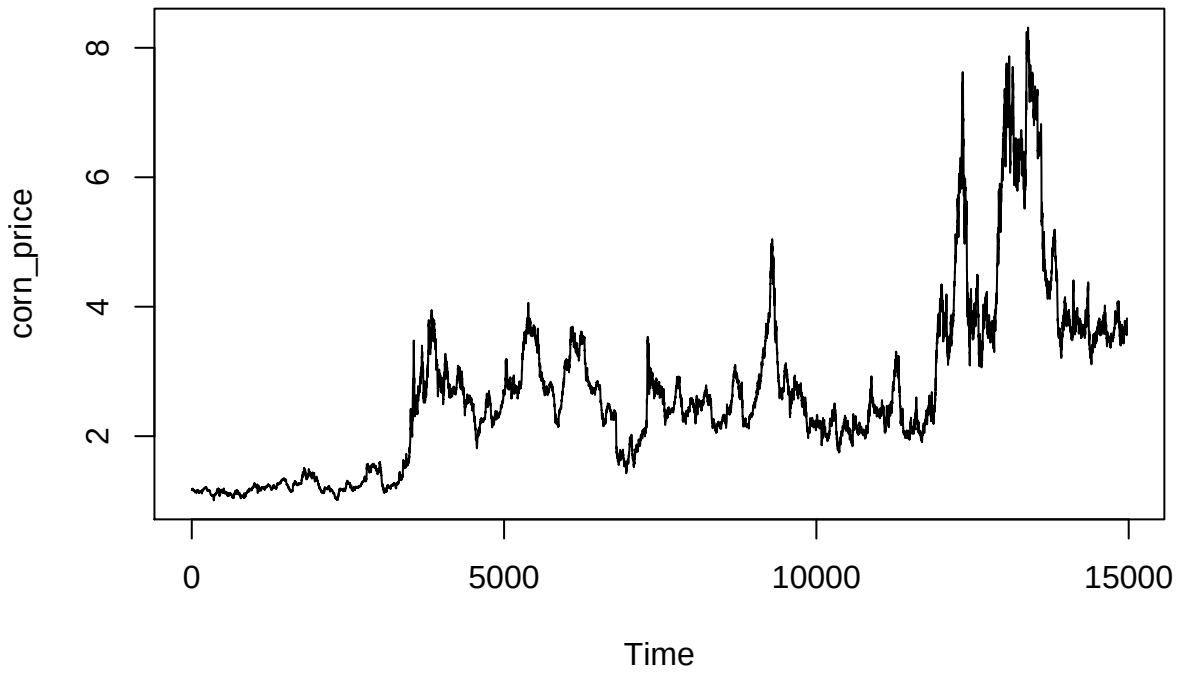
```
getwd()
```

```
## [1] "/Users/jerry/Desktop/PRMIA"
```

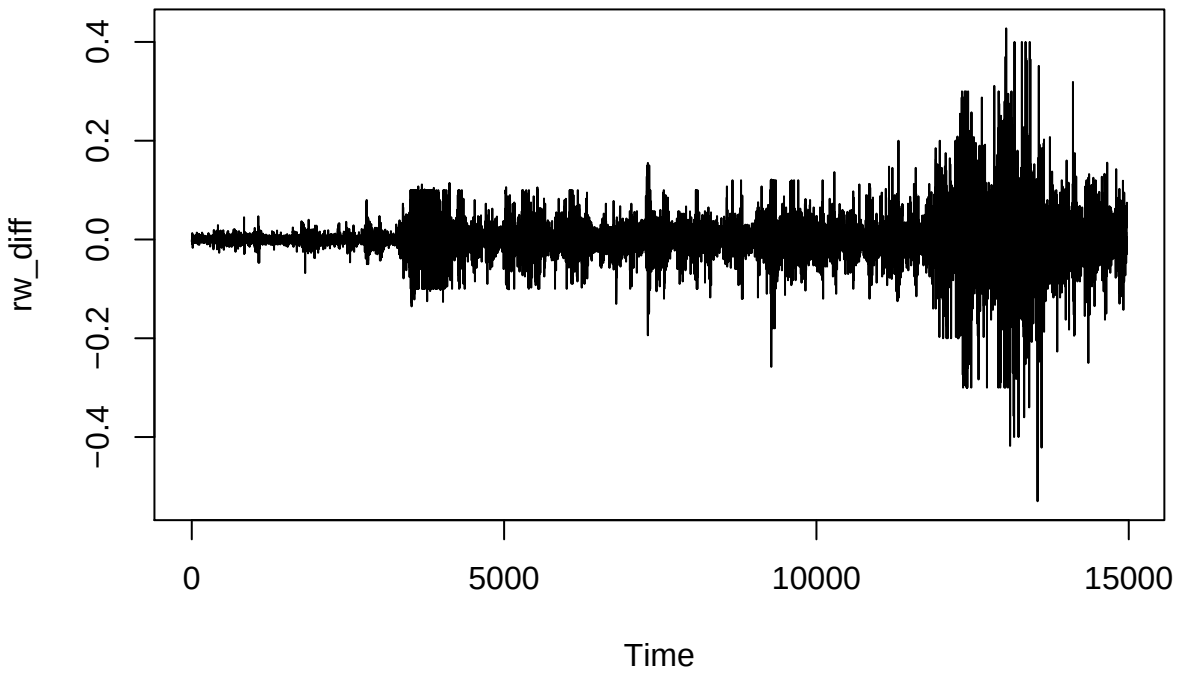
```
library(readxl)
library(ggplot2)
```

Corn

```
corn_price_df <- read_excel('corn.xlsx', sheet = 'Sheet1')
corn_price <- corn_price_df$value
date <- corn_price_df$date
ts.plot(corn_price)
```




```
rw_diff <- diff(corn_price)
ts.plot(rw_diff)
```




```
model_wn <- arima(rw_diff, order= c(0,0,0))
int_wn <- model_wn$coef
model_wn
```

```
##
## Call:
## arima(x = rw_diff, order = c(0, 0, 0))
##
## Coefficients:
##       intercept
##           2e-04
## s.e.      4e-04
##
## sigma^2 estimated as 0.002435:  log likelihood = 23802.55,  aic = -47601.09
```

```
#below is shift
int_wn
```

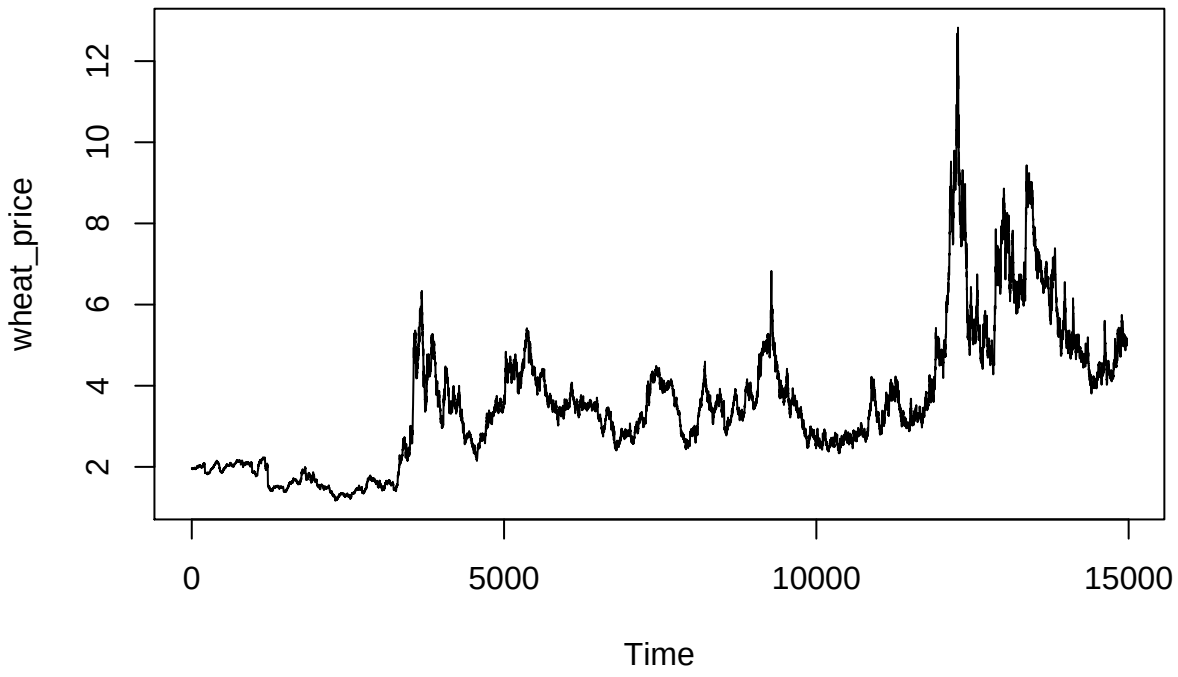
```
##    intercept
## 0.0001765413
```

```
#sd
sqrt(0.002435)
```

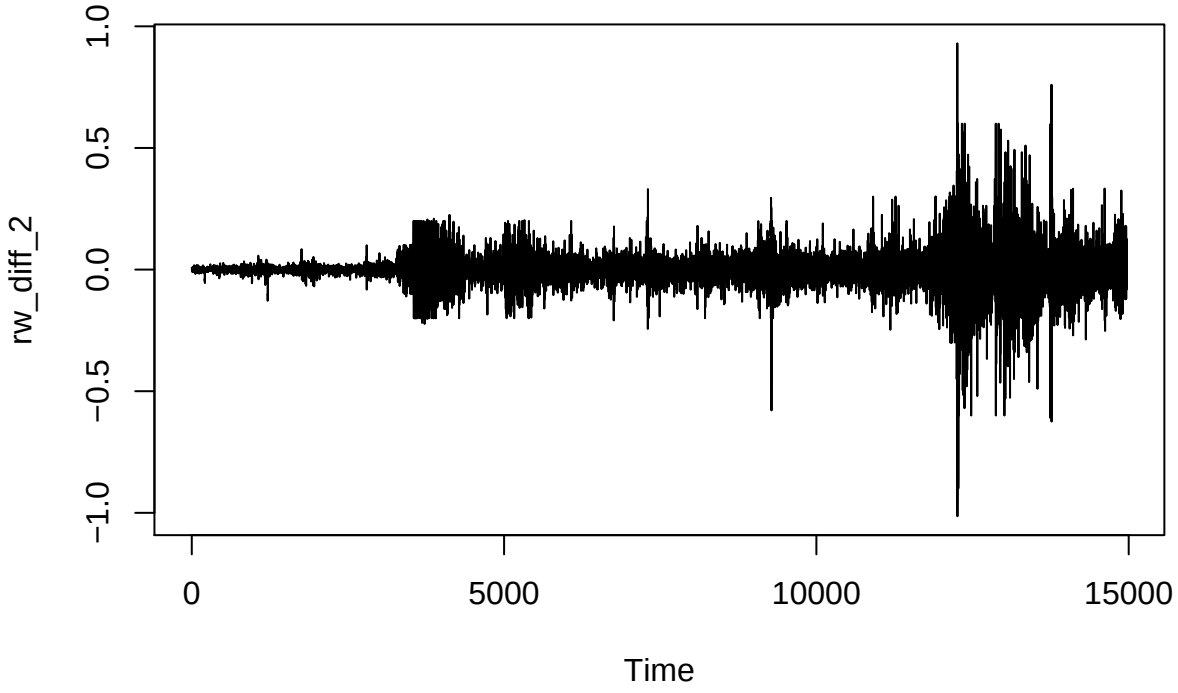
```
## [1] 0.04934572
```

Wheat

```
wheat_price_df <- read_excel('wheat.xlsx', sheet = 'Sheet1')
wheat_price <- wheat_price_df$value
date <- wheat_price_df$date
ts.plot(wheat_price)
```




```
rw_diff_2 <- diff(wheat_price)
ts.plot(rw_diff_2)
```




```
model_wn_2 <- arima(rw_diff_2, order= c(0,0,0))
int_wn_2 <- model_wn_2$coef
model_wn_2
```

```
##
## Call:
## arima(x = rw_diff_2, order = c(0, 0, 0))
##
## Coefficients:
##       intercept
##           2e-04
## s.e.      6e-04
##
## sigma^2 estimated as 0.006118:  log likelihood = 16907.67,  aic = -33811.34
```

```
#below is shift
int_wn_2
```

```
##    intercept
## 0.0002132982
```

```
sqrt(0.006118)
```

```
## [1] 0.07821765
```