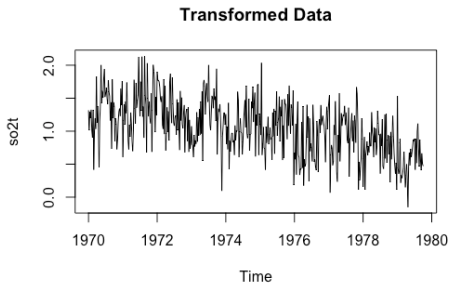
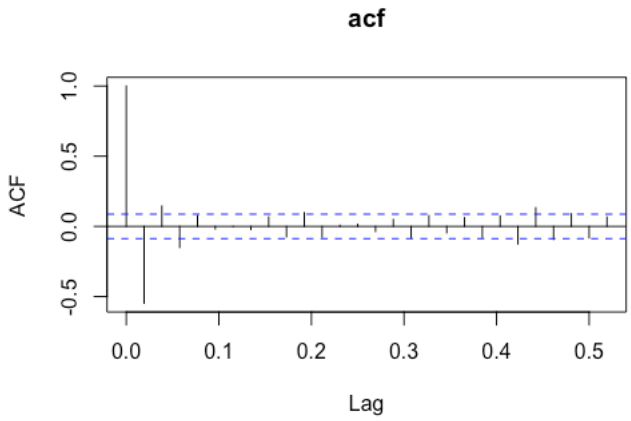
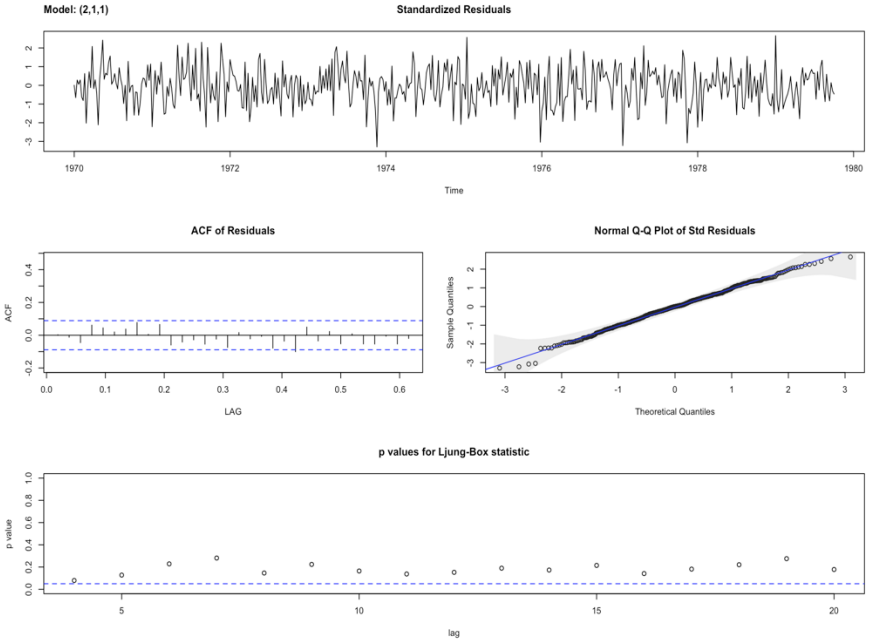
```
#Power Transformation
power=powerTransform(so2)
so2t<-bcPower(so2,.1320518)
#untransformed data
plot(so2)
#power transformed data
plot(so2t)
acf2(so2t)
#differencing data
x=diff(so2t)
plot(x)
acf(x)
pacf(x)
```

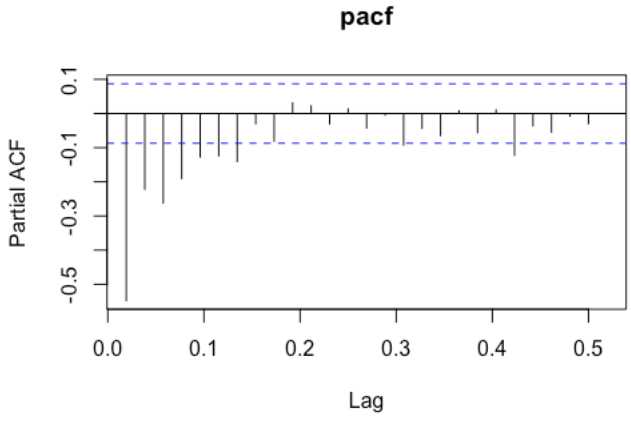
```{r}
#using auto arima function to determine paramters
auto.arima(so2t)
#plotting diagostics
#diagonistics look normal
m1=sarima(so2t,2,1,1, no.constant=TRUE);m1
pacf(resid(m1$fit))
#Forecast for the next 4 weeks
results<-sarima.for(so2t,4,2,1,1)
#95% Prediction Intervals
results$pred+(1.96*results$se)
```

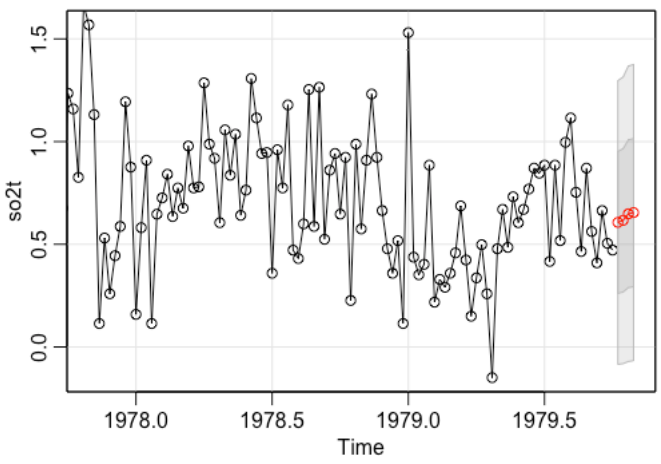
The 95% prediction intervals are 1.283436, 1.300106, 1.353382, 1.360790.
It is calculated in the r code above.
By plotting the diagnostics, the ARIMA model seems to fit. The qqplot, p values and residual plot look seem to be normal




acf
ACF
1.0
0.5
0.0
-0.5
0.0
0.1
0.2
0.3
0.4
0.5
Lag


Model: (2,1,1)
Standardized Residuals
1970
1972
1974
1976
1978
1980
Time
ACF of Residuals
ACF
LAG
Normal Q-Q Plot of Std Residuals
Sample Quantiles
Theoretical Quantiles
p values for Ljung-Box statistic
p value
lag


pacf
Partial ACF
0.1
-0.1
-0.3
-0.5
0.0
0.1
0.2
0.3
0.4
0.5
Lag


so2t
0.0
0.5
1.0
1.5
1978.0
1978.5
1979.0
1979.5
Time