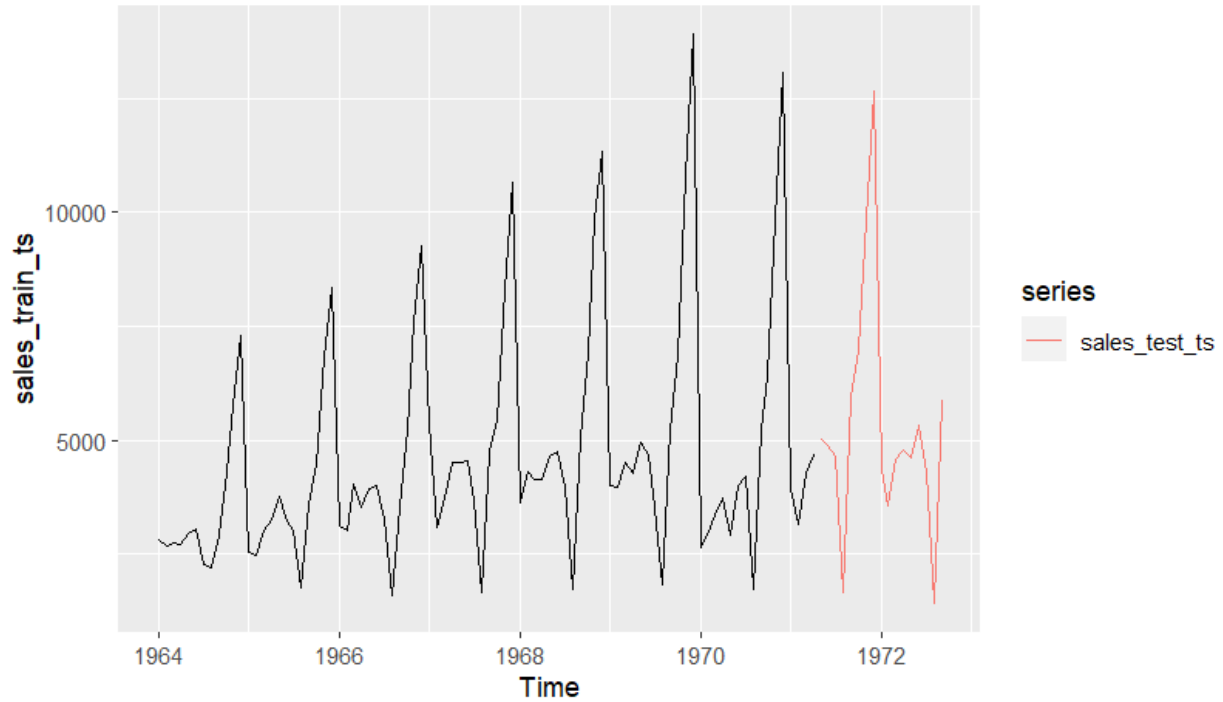
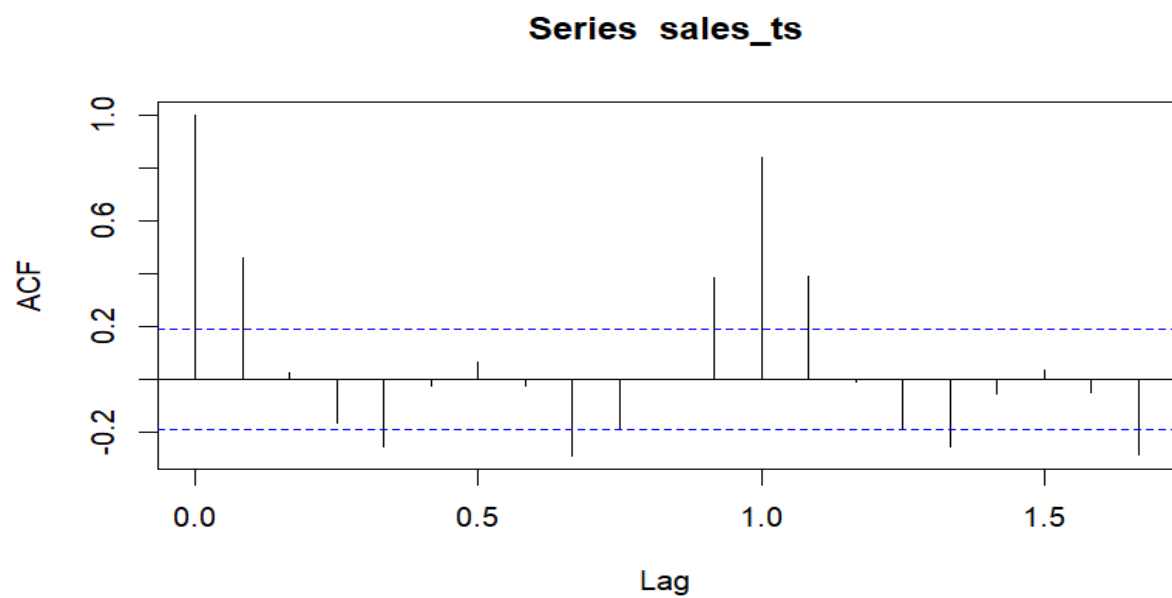


Plots and Summaries of Models for Sales Data Q1

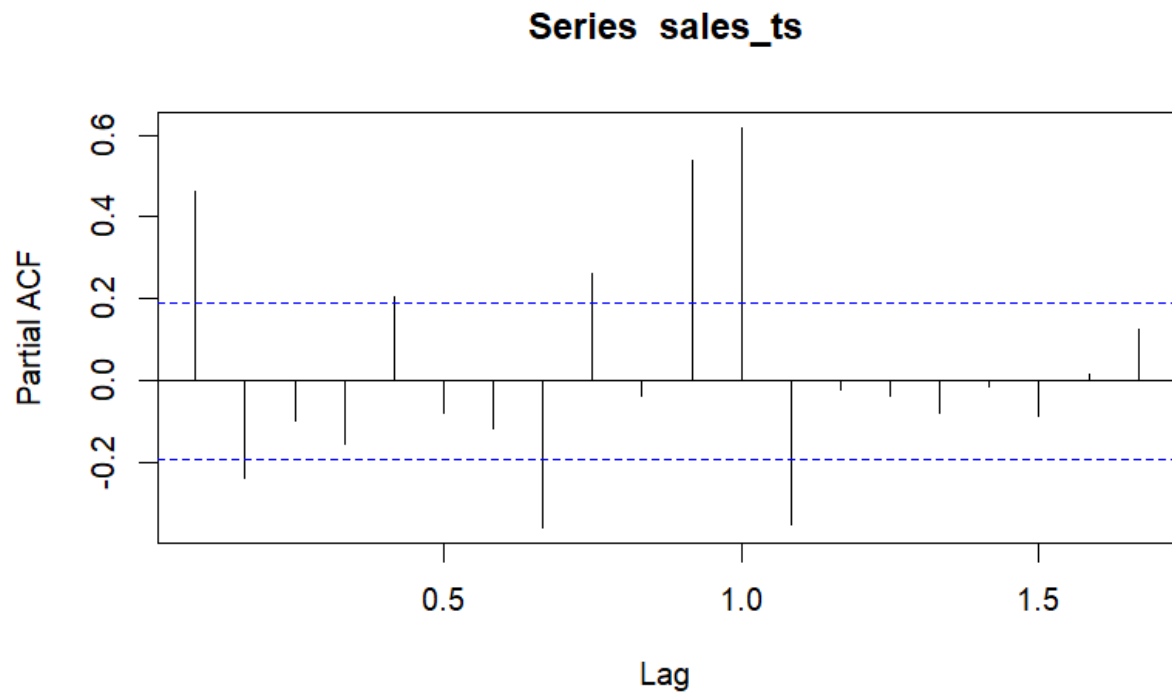
Plot of sales data



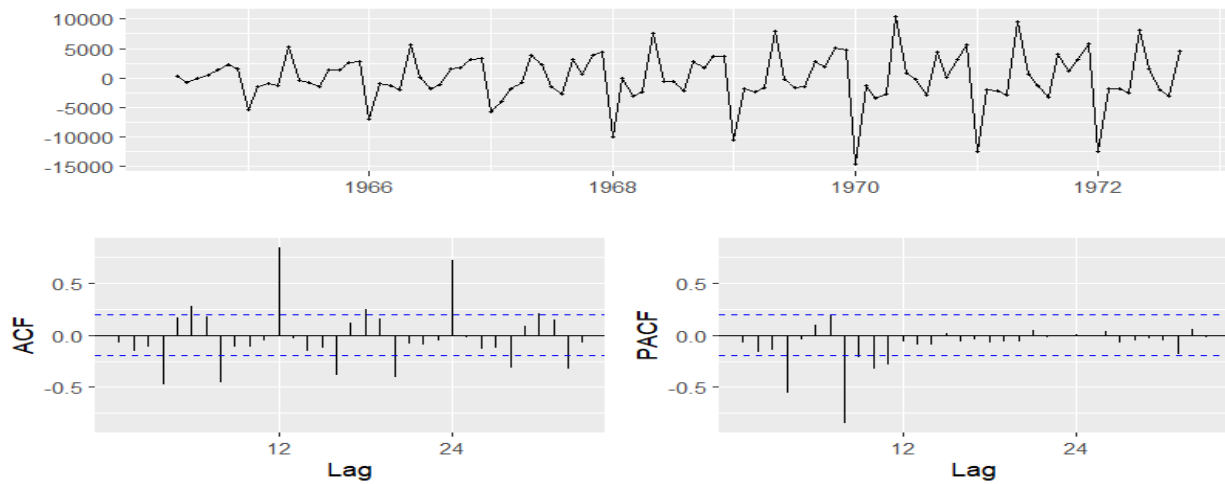
ACF PLOT



PACF PLOT



LAG PLOTS



Model summary of Model1 and Model 2

```
> summary(fit_md1_1)
Series: .
ARIMA(1,0,0)(1,1,0)[12]

Coefficients:
      ar1      sar1
    0.4126  -0.2755
s.e.  0.1178   0.1298

sigma^2 = 624026:  log likelihood = -614.46
AIC=1234.93  AICc=1235.26  BIC=1241.92

Training set error measures:
              ME      RMSE      MAE      MPE      MAPE      MASE      ACF1
Training set 190.0693 724.3958 499.1049 1.294197 11.79737 0.7711161 -0.1195454
> summary(fit_md1_2)
Series: .
ARIMA(1,1,0)(1,1,0)[12]

Coefficients:
      ar1      sar1
    -0.3592  -0.3300
s.e.  0.1097   0.1142

sigma^2 = 756352:  log likelihood = -613.78
AIC=1233.55  AICc=1233.89  BIC=1240.51

Training set error measures:
              ME      RMSE      MAE      MPE      MAPE      MASE      ACF1
Training set 15.59215 792.1036 536.2067 -3.170981 14.09491 0.8284383 -0.1120752
> summary(fit_md1_3)
```

Model summary of Models 3 and 4

```
> summary(fit_md1_3)
Series: .
ARIMA(1,1,0)(1,2,0)[12]

Coefficients:
      ar1      sar1
    -0.3533  -0.7328
s.e.  0.1207   0.0803

sigma^2 = 1122675:  log likelihood = -535.64
AIC=1077.28  AICc=1077.69  BIC=1083.71

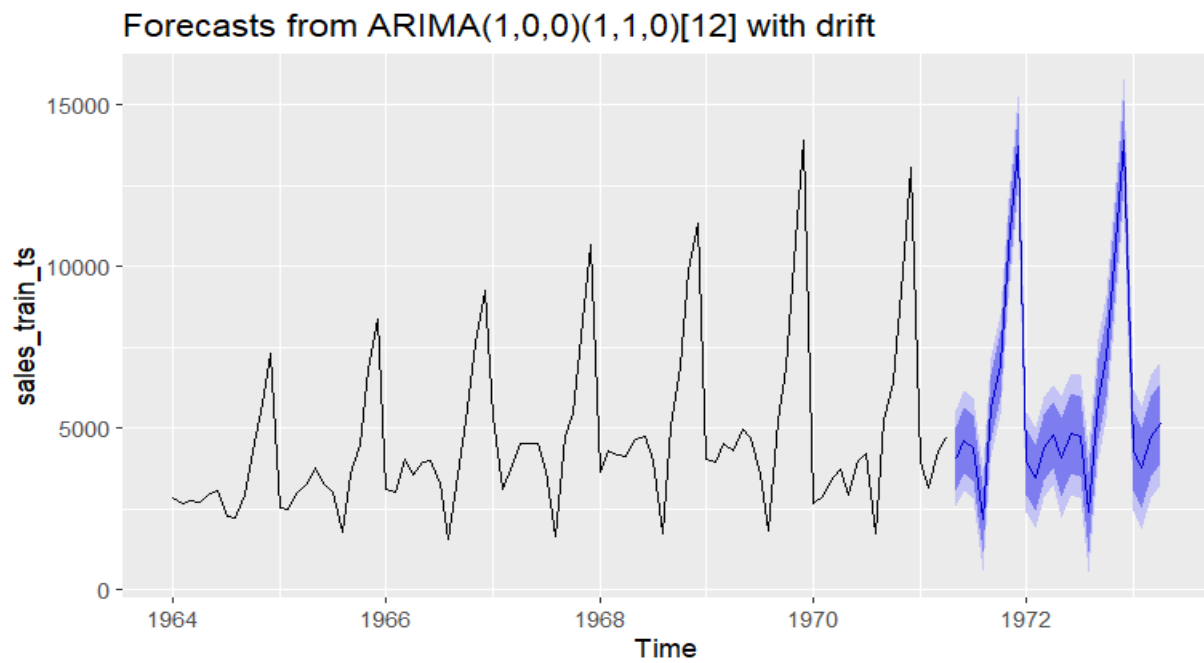
Training set error measures:
              ME      RMSE      MAE      MPE      MAPE      MASE      ACF1
Training set -11.64499 882.1666 537.7247 -0.6905219 13.40654 0.8307837 -0.1153628
> summary(aa_md1)
Series: sales_train_ts
ARIMA(1,0,0)(1,1,0)[12] with drift

Coefficients:
      ar1      sar1      drift
    0.294  -0.3029  24.6941
s.e.  0.116   0.1220   7.9645

sigma^2 = 572660:  log likelihood = -610.74
AIC=1229.47  AICc=1230.04  BIC=1238.8

Training set error measures:
              ME      RMSE      MAE      MPE      MAPE      MASE      ACF1
Training set 4.121649 689.2369 471.1291 -3.601819 11.84703 0.7278936 -0.007672859
```

Forecast data with confidence intervals with model 4 which has least RMSE



Forecast plot with actual vs forecast data

