Model Comparison

Libraries

```
library(forecast)
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

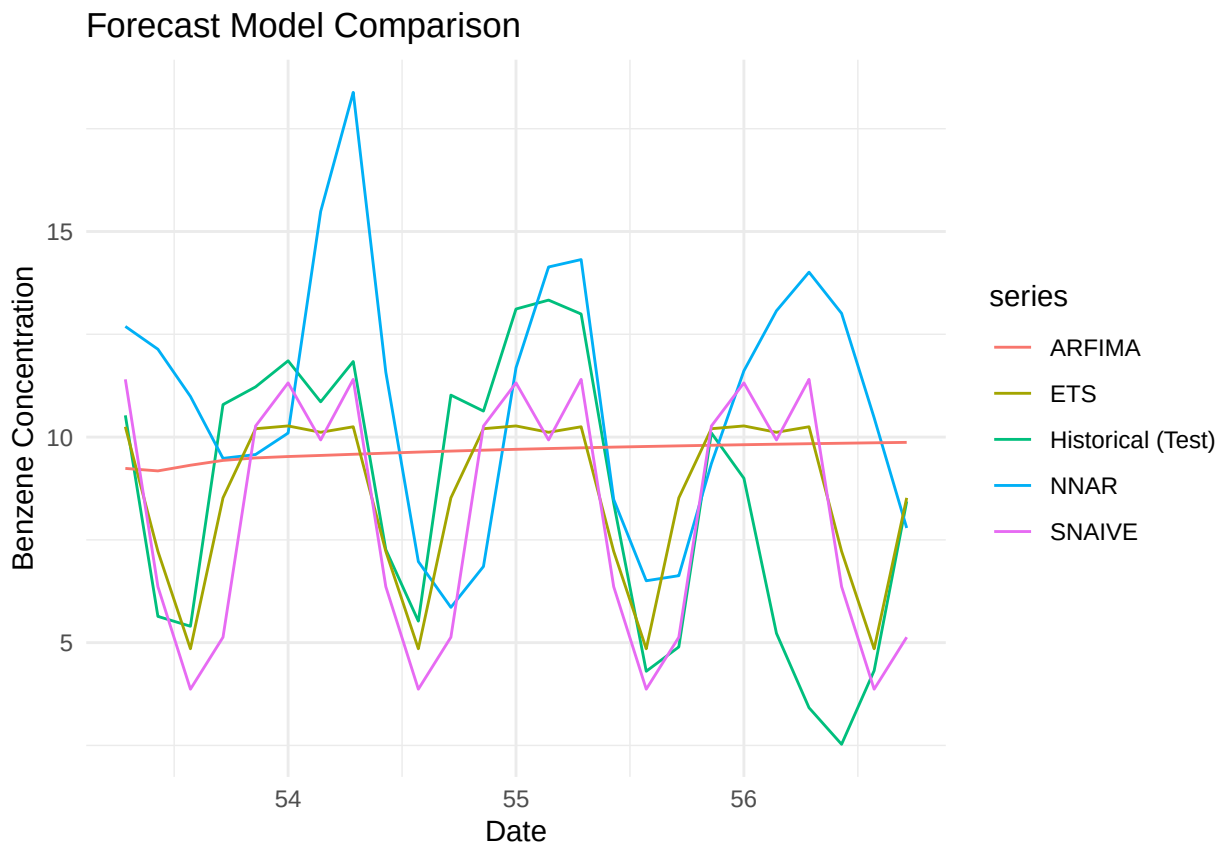
```
library(ggplot2)
```

Load Data

```
load("~/Downloads/ts_test_data")
load("~/Downloads/model_1_forecast_values.RData")
load("~/Downloads/model_2_forecast_values.RData")
load("~/Downloads/model_3_forecast_values.RData")
load("~/Downloads/model_4_forecast_values.RData")
```

Forecasts

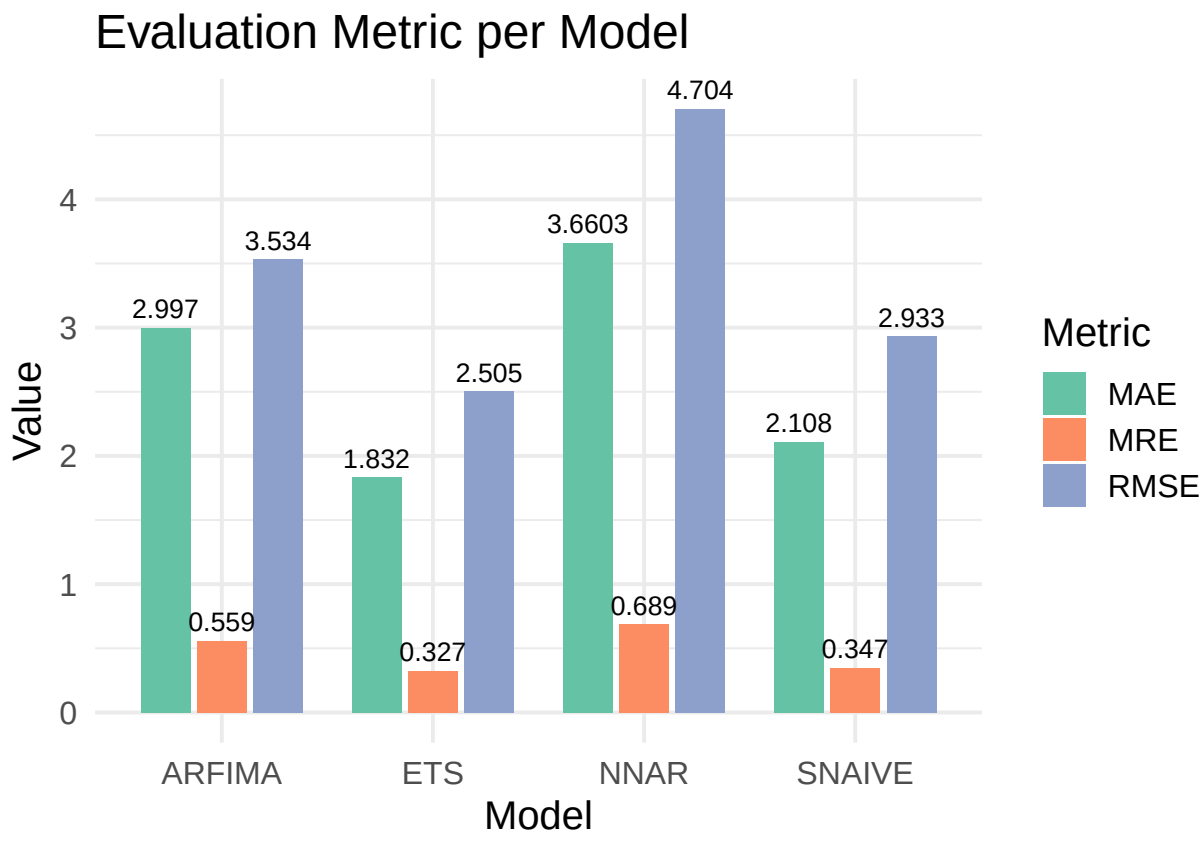
```
autoplot(ts_test_data, series = "Historical (Test)") +
    autolayer(model_4_forecast_values$mean, series = "NNAR") +
    autolayer(model_3_forecast_values$mean, series = "ARFIMA") +
    autolayer(model_2_forecast_values$mean, series = "ETS") +
    autolayer(model_1_forecast_values$mean, series = "SNAIVE") +
    labs(title = "Forecast Model Comparison",
         x = "Date", y = "Benzene Concentration") +
    theme_minimal()
```



Metrics

```
data <- data.frame(
  Model = c("SNAIVE", "SNAIVE", "SNAIVE", "ETS", "ETS", "ETS", "ARFIMA", "ARFIMA", "ARFIMA", "NNAR", "NN
  Metric = c("MRE", "MAE","RMSE", "MRE", "MAE","RMSE", "MRE", "MAE","RMSE", "MRE", "MAE","RMSE"),
  Value = c( 0.347, 2.108, 2.933, 0.327, 1.832, 2.505, 0.559, 2.997, 3.534, 0.689, 3.6603, 4.704)
)

ggplot(data, aes(x = Model, y = Value, fill = Metric)) +
  geom_bar(stat = "identity", position = position_dodge(width = 0.8), width = 0.7) +
  geom_text(aes(label = Value), position = position_dodge(width = 0.8), vjust = -0.5, size = 3.5) +  # A
  labs(title = "Evaluation Metric per Model",
       x = "Model",
       y = "Value") +
  scale_fill_brewer(palette = "Set2") +  # Color Palette
  theme_minimal(base_size = 15)  # Minimal Theme with Larger Font Size
```


Evaluation Metric per Model
Value
Model
Metric
MAE
MRE
RMSE
ARFIMA
ETS
NNAR
SNAIVE
2.997
0.559
3.534
1.832
0.327
2.505
3.6603
0.689
4.704
2.108
0.347
2.933
0
1
2
3
4