```
## Loading required package:  Defaults
## Loading required package:  xts
## Loading required package:  zoo
##
## Attaching package:  'zoo'
##
## The following object(s) are masked from 'package:base':
##
## as.Date, as.Date.numeric
##
## Loading required package:  TTR
```

Estimating Traffic Volumes in Athens: TRB data analysis competition

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Abstract

Traffic loop detectors are important tools for recording and monitoring vehicle flows along major routes in a region. The reliability of these detectors, however, is such that certain important observations may be missing. In this study, we employ an approach based on traffic flow theory and joined with time series econometrics to impute missing values, and make modest projections, from loop detector data in Athens, Greece.

Keywords: TRB data analysis competition, traffic forecasting

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1. Introduction

1.1. Literature

2. Model

```r
MyData <- read.csv("./Source_Data/data_additional_April.csv")
lanes <- c(1, 2, 3, 4, 6, 7, 8)

# Convert timestamp
MyData$TIMESTAMP <- as.POSIXct(strptime(MyData$TIMESTAMP, format = "%m/%d/%y %H:%M"))
```

2.1. Estimation

We estimate an autoregressive model for each lane, and present the coefficient estimates in Table 1

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Table 1: Autoregressive Model Coefficients

```
AR1Coefs <- as.table(matrix(NA, ncol = length(AR1models), nrow = 3))
for (i in 1:length(AR1models)) {
    AR1Coefs[1:2, i] <- t(coef(AR1models[[i]]))
    AR1Coefs[3, i] <- summary(AR1models[[i]])$r.squared
    colnames(AR1Coefs)[i] <- paste("Lane ", lanes[i], sep = "")
}
rownames(AR1Coefs) <- c("Intercept", "Lag", "$R^2$")

coefs.x <- xtable(AR1Coefs)
print(coefs.x, floating = FALSE, sanitize.rownames.function = function(x) {
    x
})
```

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 6	Lane 7	Lane 8
Intercept	3.77	6.36	5.82	9.47	12.20	5.23	4.93
Lag	0.90	0.83	0.85	0.70	0.74	0.84	0.84
R^2	0.81	0.70	0.72	0.49	0.55	0.71	0.72

```
model1 <- lm(L101_volume ~ Lag(L101_volume, k = 1), data = MyData)
model2 <- lm(L102_volume ~ Lag(L102_volume, k = 1), data = MyData)
model3 <- lm(L103_volume ~ Lag(L103_volume, k = 1), data = MyData)
model4 <- lm(L104_volume ~ Lag(L104_volume, k = 1), data = MyData)
model6 <- lm(L106_volume ~ Lag(L106_volume, k = 1), data = MyData)
model7 <- lm(L107_volume ~ Lag(L107_volume, k = 1), data = MyData)
model8 <- lm(L108_volume ~ Lag(L108_volume, k = 1), data = MyData)
AR1models <- list(model1, model2, model3, model4, model6, model7,
    model8)
```

3. Forecasting

4. Conclusion

A word on execution

This project was executed as a training exercise on literate programming using R (R Development Core Team, 2012), `knitr` (Xie, 2012), and LaTeX. The source code is available on GitHub as the `GT_TranspoComp` project.

References

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