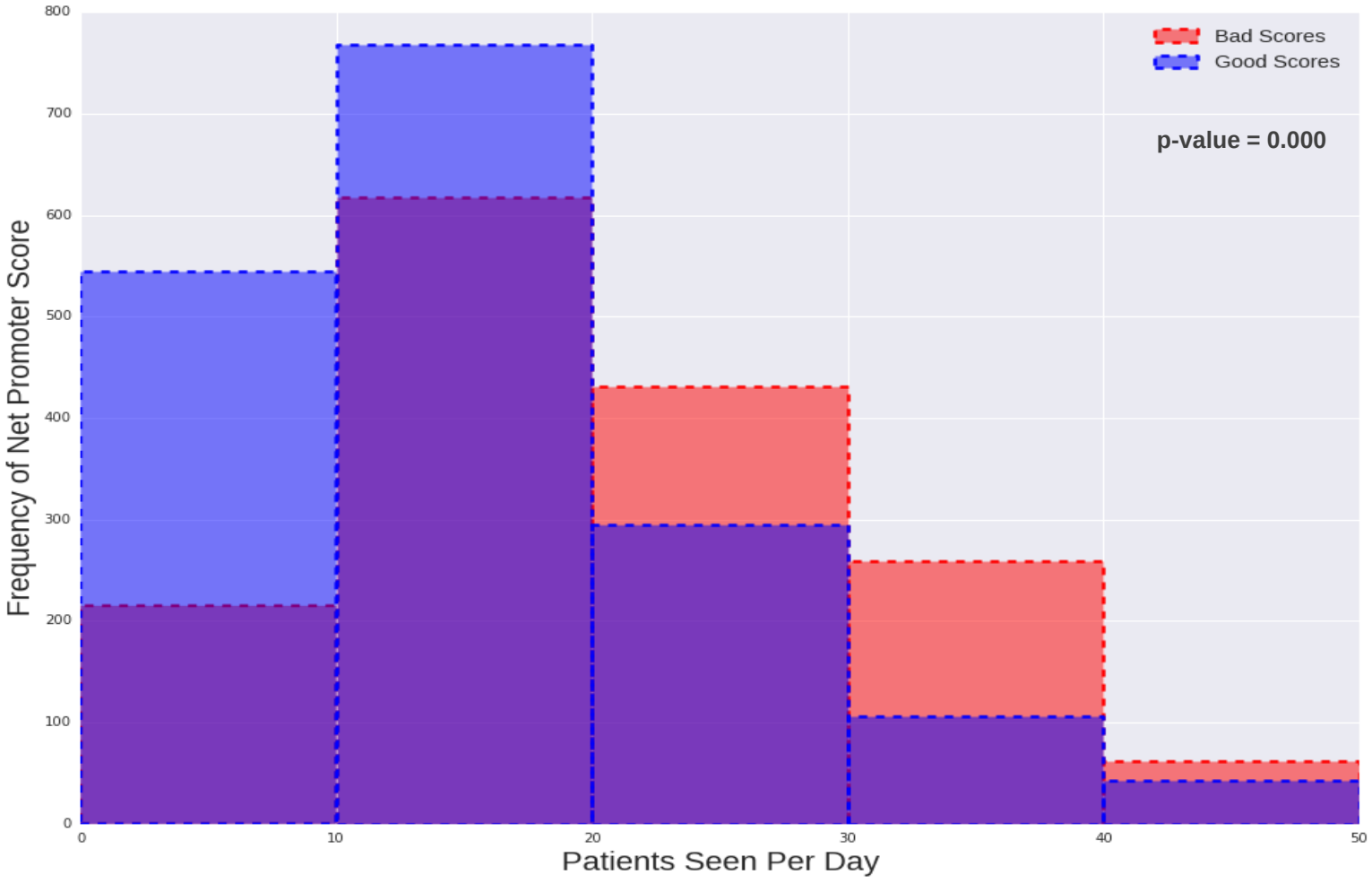
Polling Patients: Elevating the Healthcare Experience

ANJALI SHAH

INSIGHT PROJECT PRESENTATION

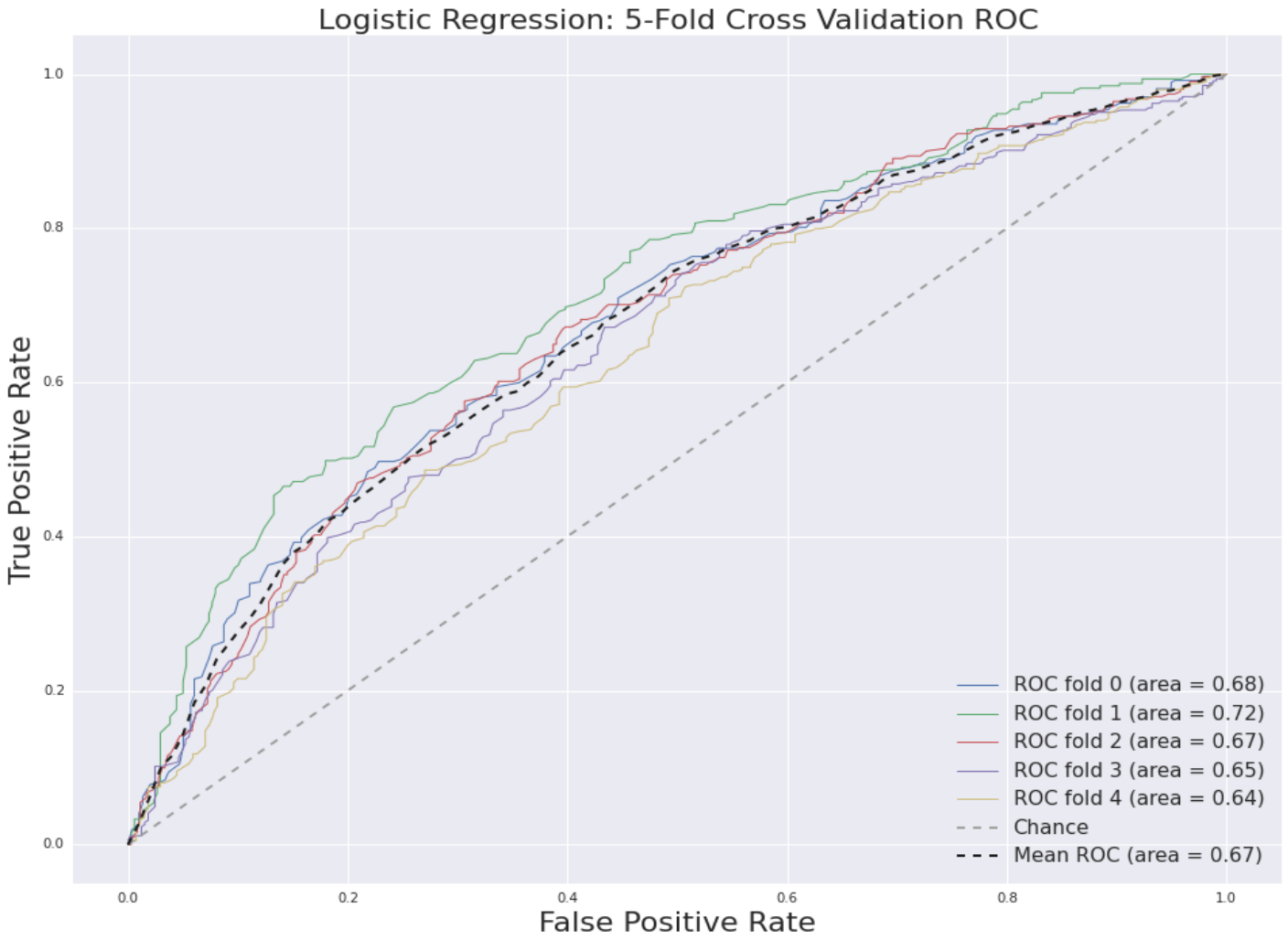
Finding the Optimal Number of Patients Per Provider



Actionable Insights

- Statistically significant difference between good and bad score distributions
- Patients per provider in a day (95% CL):
  - ✓ Good Scores: 14 – 15 patients
  - ✓ Bad Scores: 19 – 20 patients

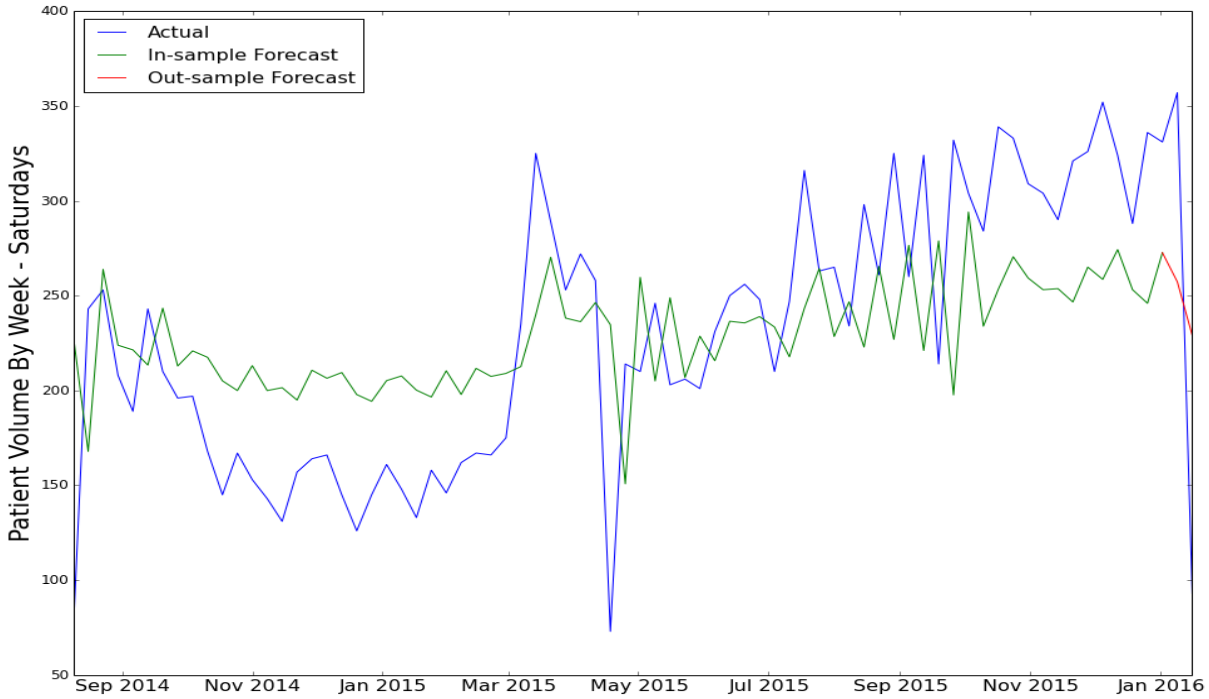
Classifying Scores by Weekday & Patients Per Day



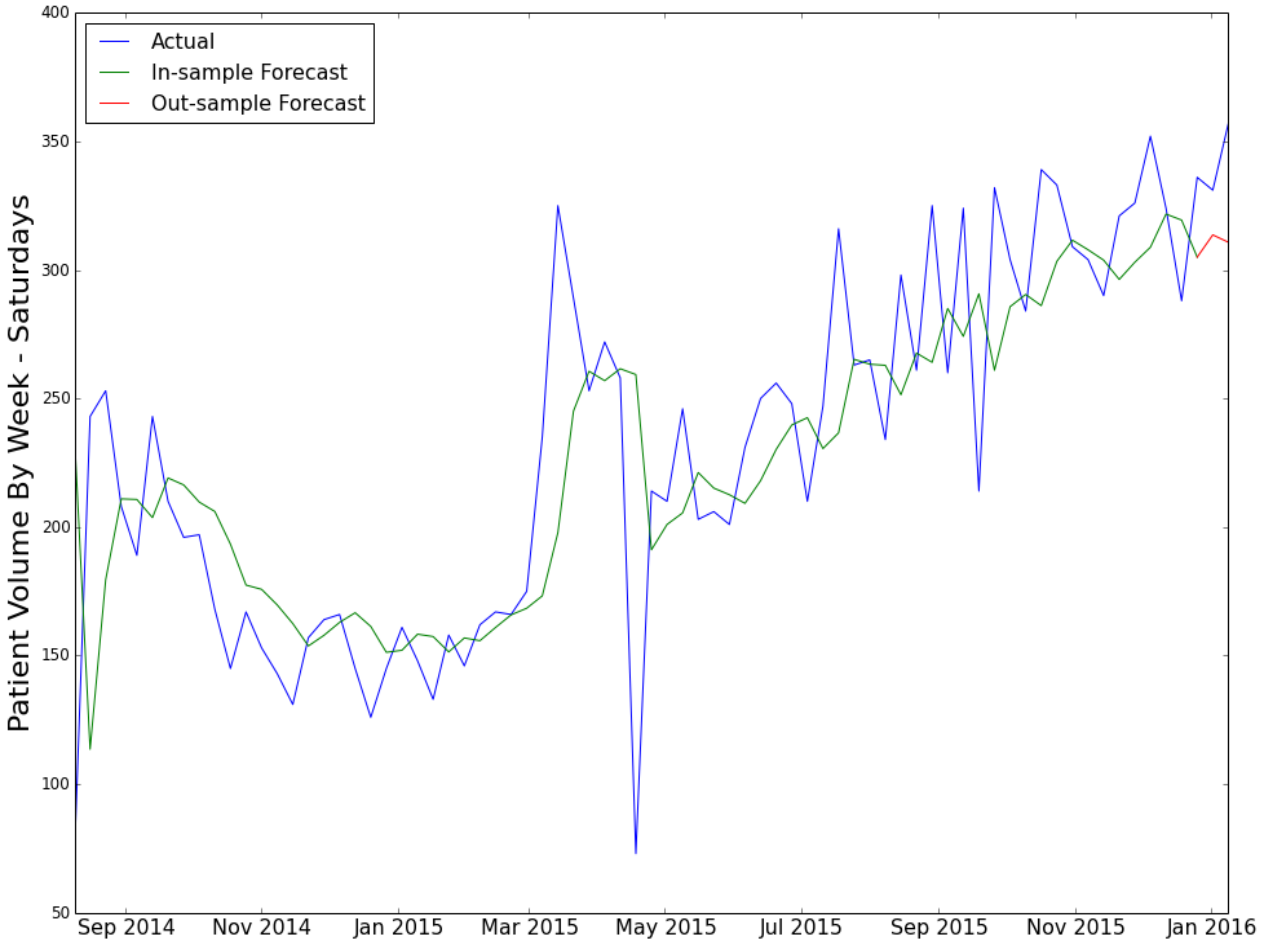
Model	Total Running Time	ROC AUC using 10-fold CV
Logistic Regression	0.004	0.68
Naïve Bayes	0.002	0.64
SVC	0.16	0.67
Random Forest	0.03	0.62

Forecasting Patient Volume (monthly data)

AR(0,0,1) Model



AR(1,0,1) Model



Actionable Insights

- Mean absolute percentage error = ~17%
- Predicted volume for 2016-01-23: 320 patients

Putting It All Together

Final Product

Statistical Mann-Whitney U Test
Logistic Regression Model
Time Series Analysis

http://anjalibshah.github.io/Elevating-Healthcare-Experience/

How will it help the startup and elevate patients' healthcare experience?

Optimum Management

Better Experience

Happy Customers

About Me

PhD

- Biomedical Informatics

Masters and Bachelors

- Computer Science and Engineering

Professional Experience

- 10+ years of professional experience across education, healthcare, financial services, and telecom sectors

Former Employers

Goldman Sachs

TEMPLE UNIVERSITY

BNP PARIBAS

RUTGERS

My Passion

Travel and…

Scrapbooking

Appendix

Algorithm and Data Analysis Approach

Algorithm Stages and Pipeline

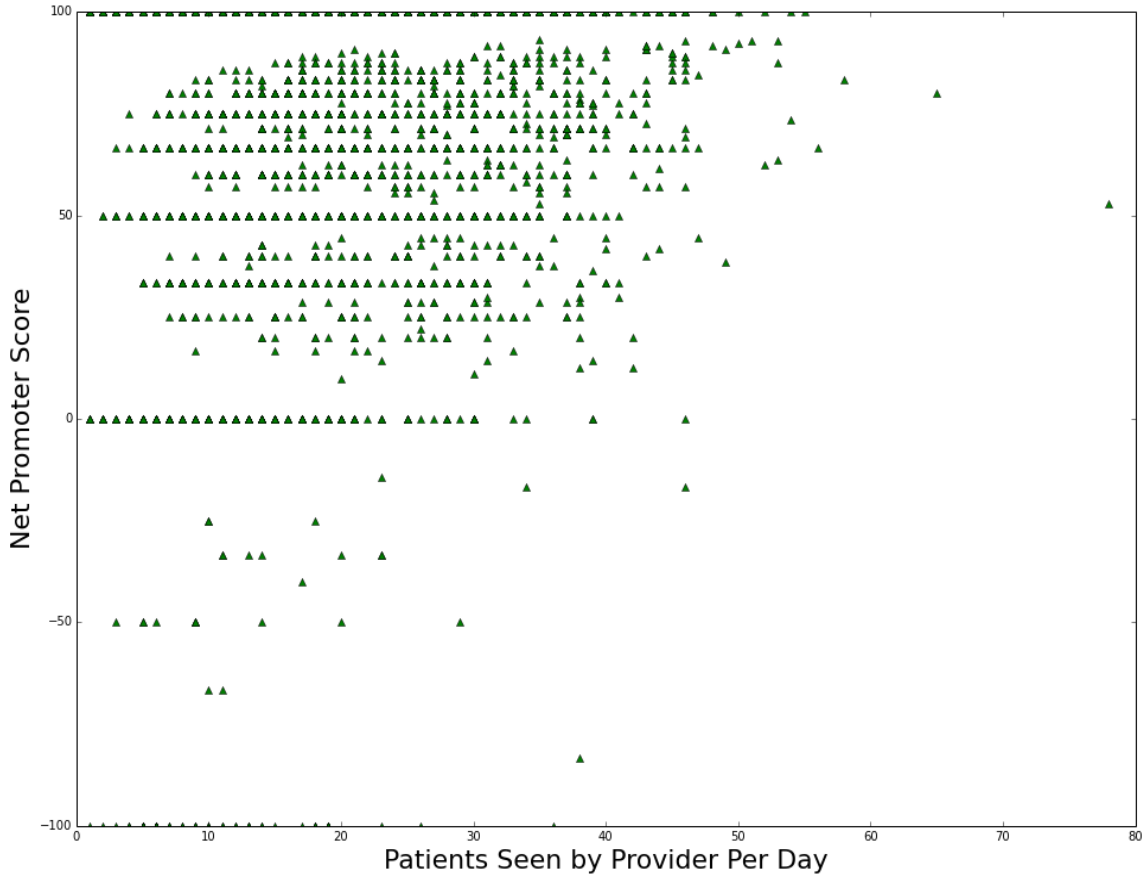
Features

- Customer ID
- Site ID
- Provider ID
- Patient ID
- Visit ID
- Date Seen
- Score

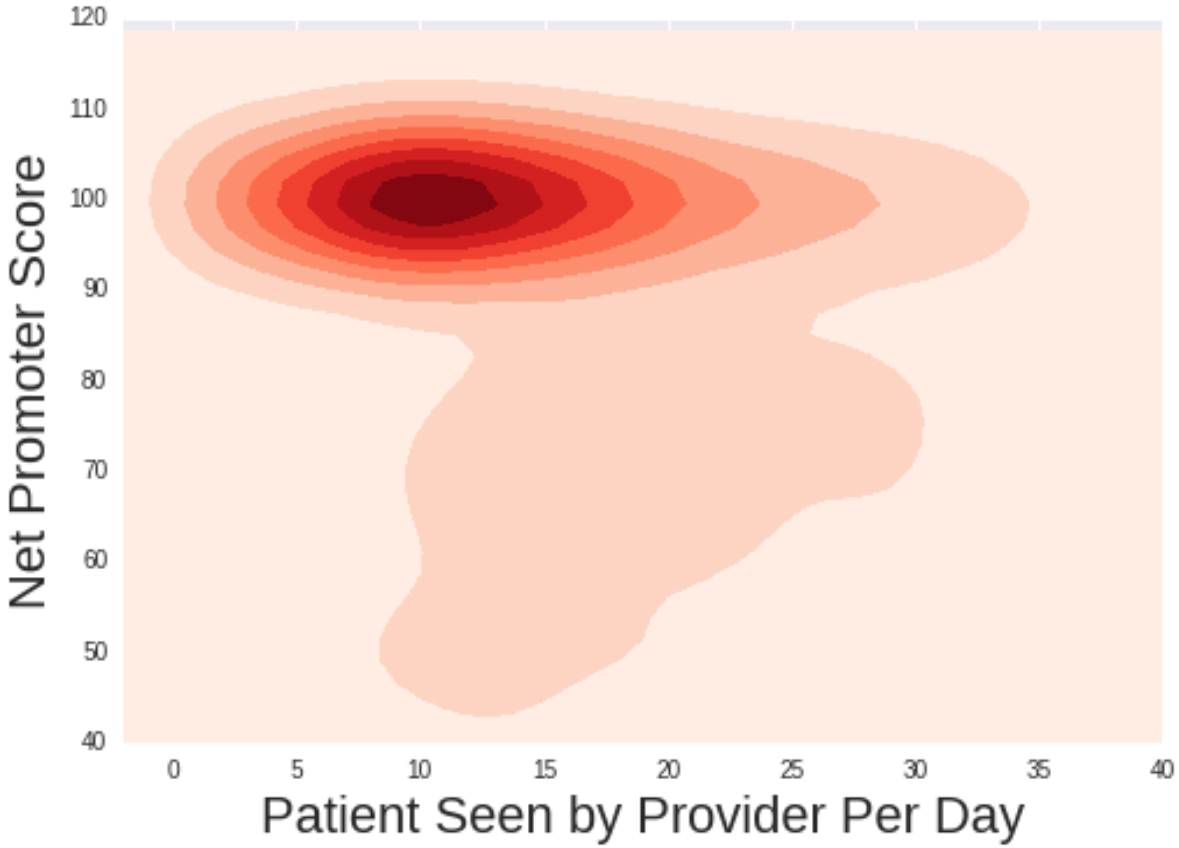
1. Patients seen by provider per day
2. Day of the week
3. Net promoter score

Visualization of the Distribution

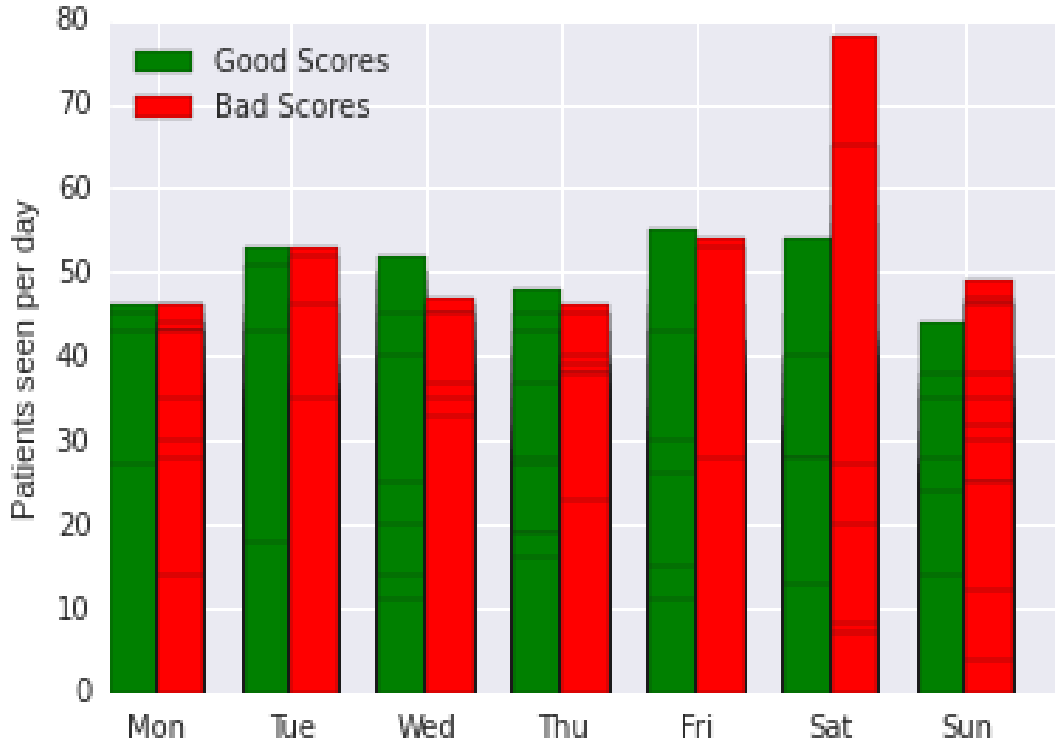
Scatterplot Distribution



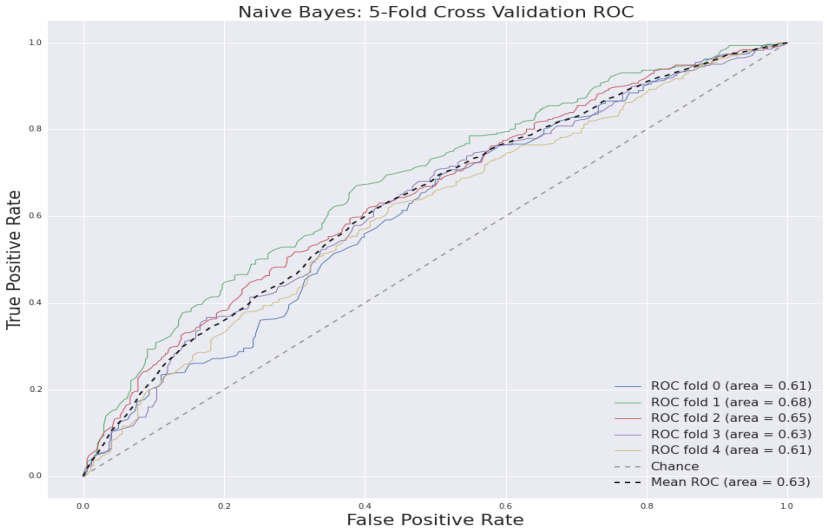
Kernel Density Estimation

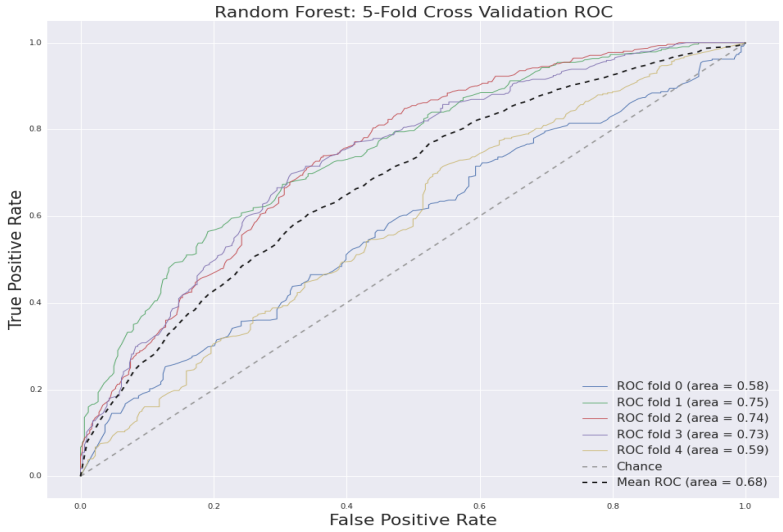


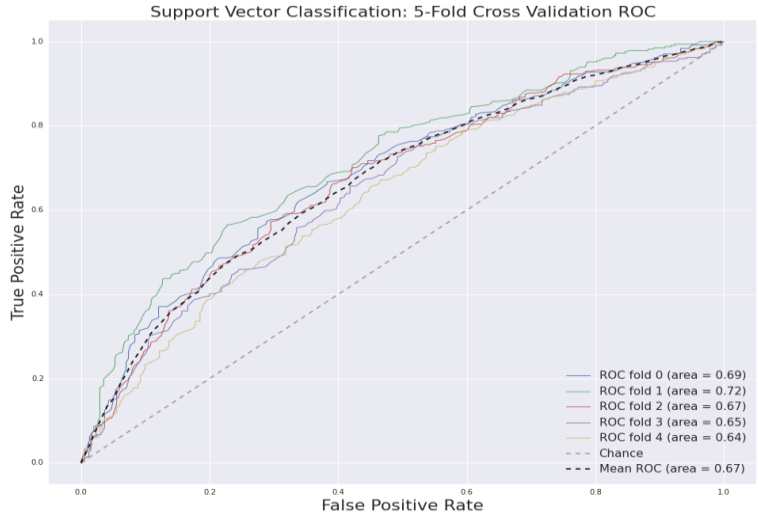
Classifying Scores by Weekday & Patients Per Day



Classifying Scores by Weekday & Patients Per Day

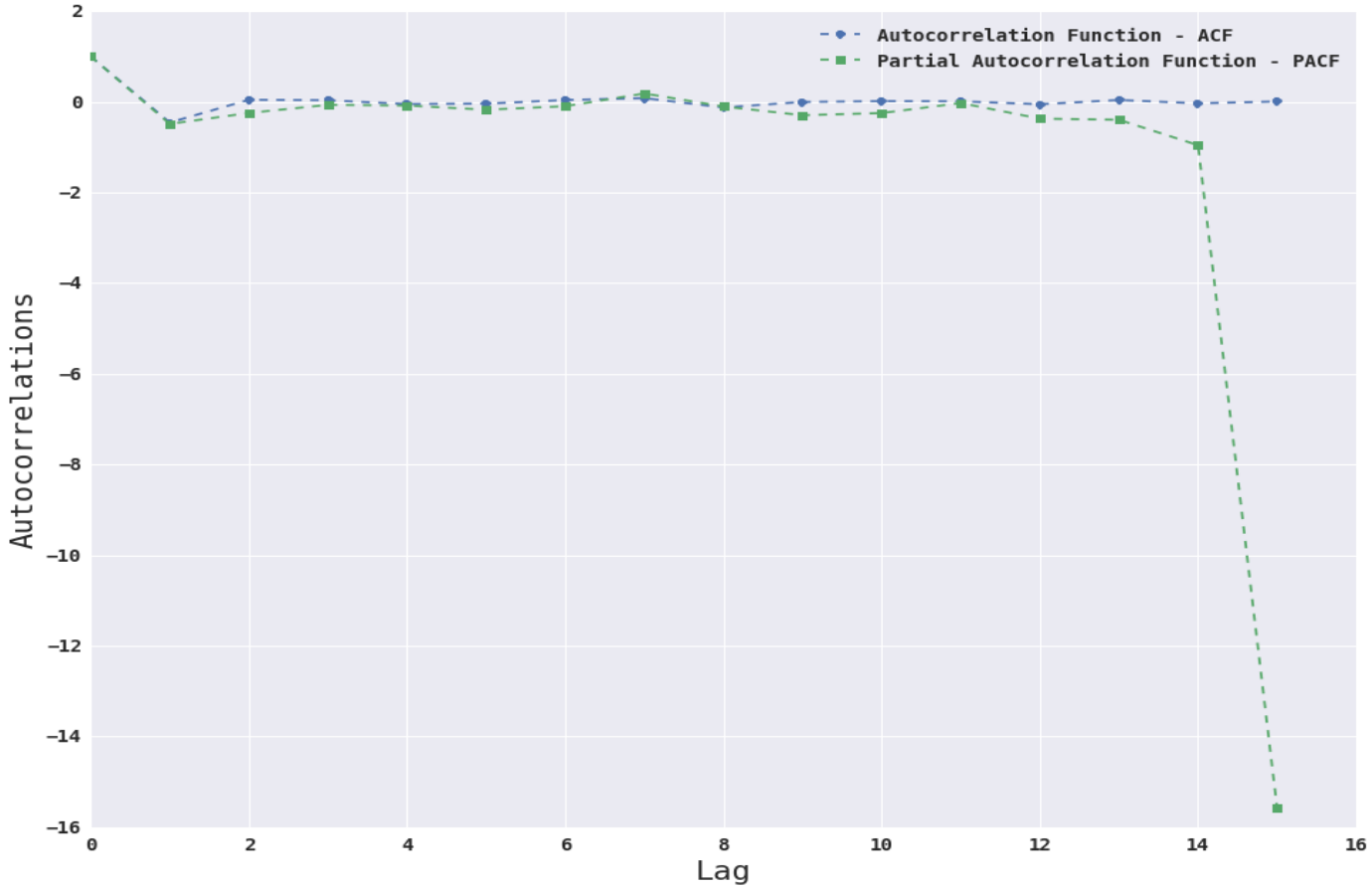




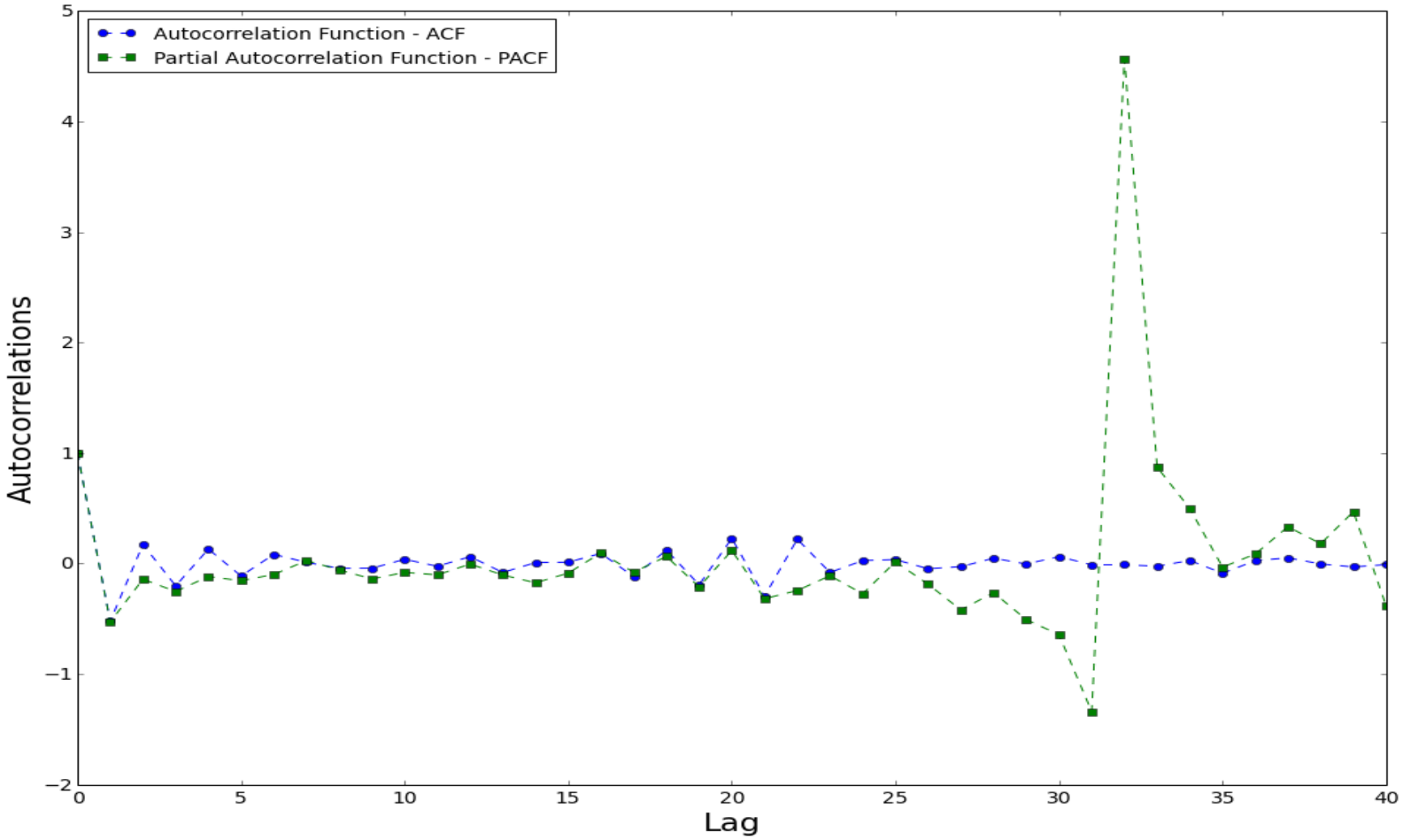


Logistic Regression Classification Summary	Precision	Recall	F1-score
Bad Score	0.60	0.45	0.52
Good Score	0.61	0.74	0.67
ROC AUC with 10-fold Cross-validation	0.68		

Plots of ACF and PACF (Monthly)



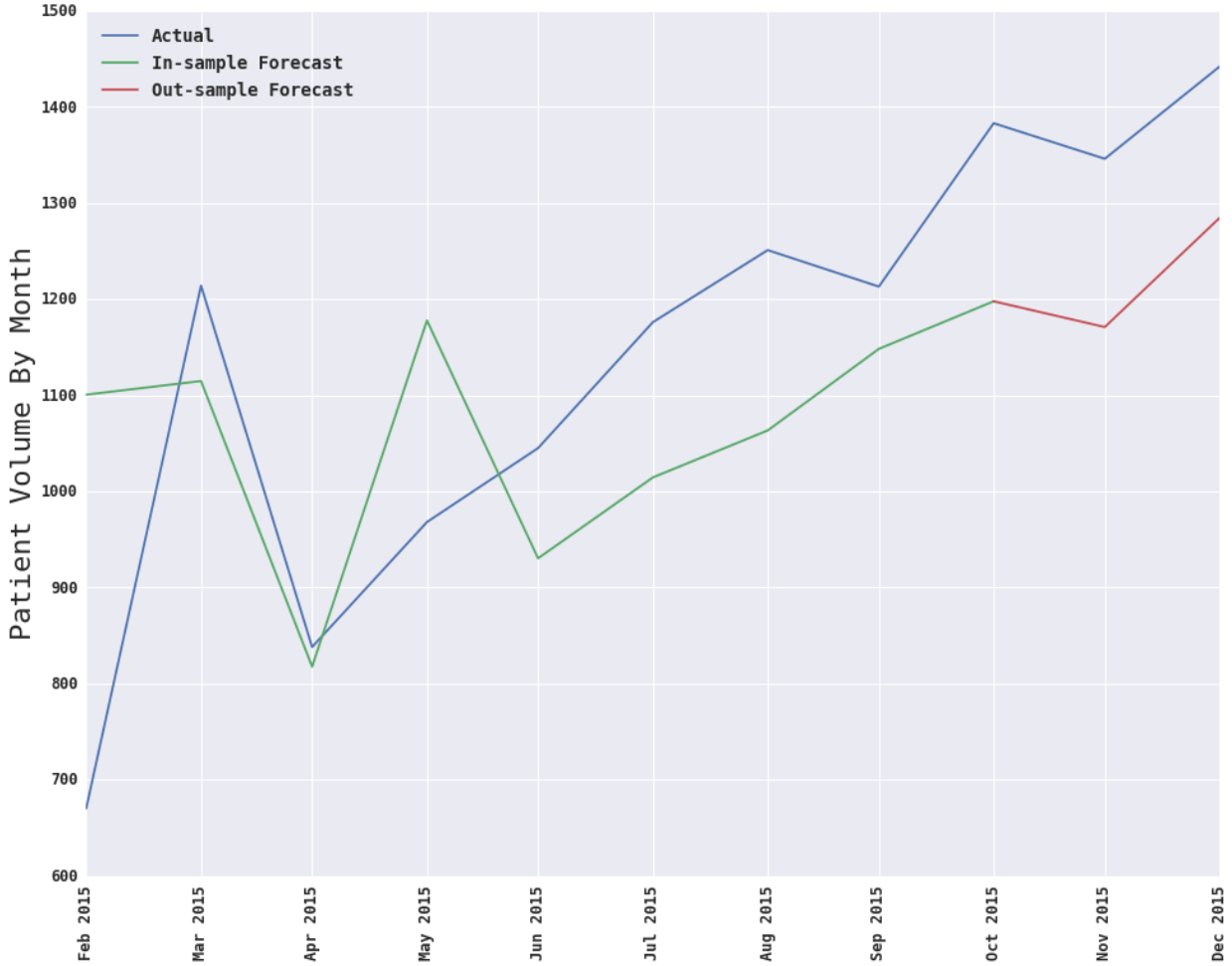
Plots of ACF and PACF (Weekly)



Forecasting Patient Volume (monthly data)

AR(1) Model

AR(2) Model



Actionable Insights

- Mean absolute percentage error = ~17%
- Predicted volume for 2016-01-31: 1320 patients