Chicago PD District 11

Criminalistics

Riley, Sydney, Spencer, and Hyeji
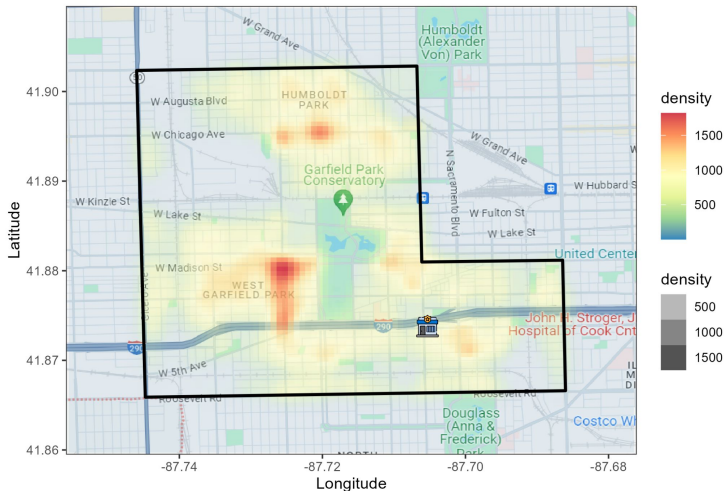
"Our analytical skills light the path through the darkest mysteries"
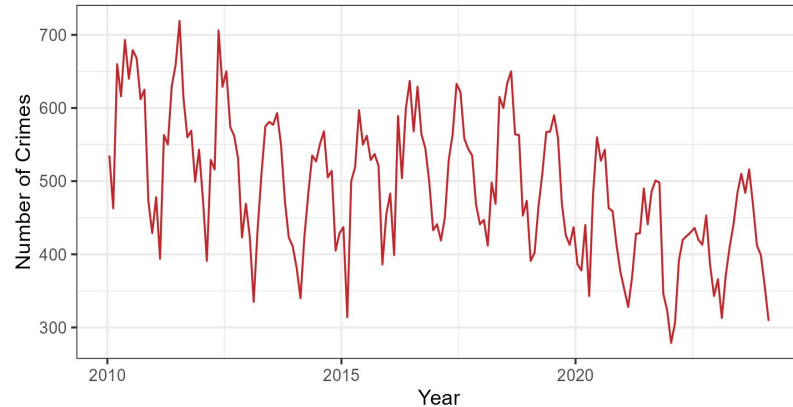
With

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The **Problem**

- What factors affect violent crimes?
- Do more crimes happen during a full moon?
- What can the Chicago PD do to help prevent violent Crimes?

Violent Crimes in District 11

Number of Crimes per Month Over Time

Violent crimes as defined by Chicago PD:

- Homicide
- Battery
- Crime Sexual Assault
- Assault
- Robbery
- Human trafficking

The Data's **Strengths** and **Weaknesses**

Strengths

We have extensive data for a large time period with lots of different options for factors.

Weaknesses

Many of the features available to us are unhelpful when forecasting future crime numbers
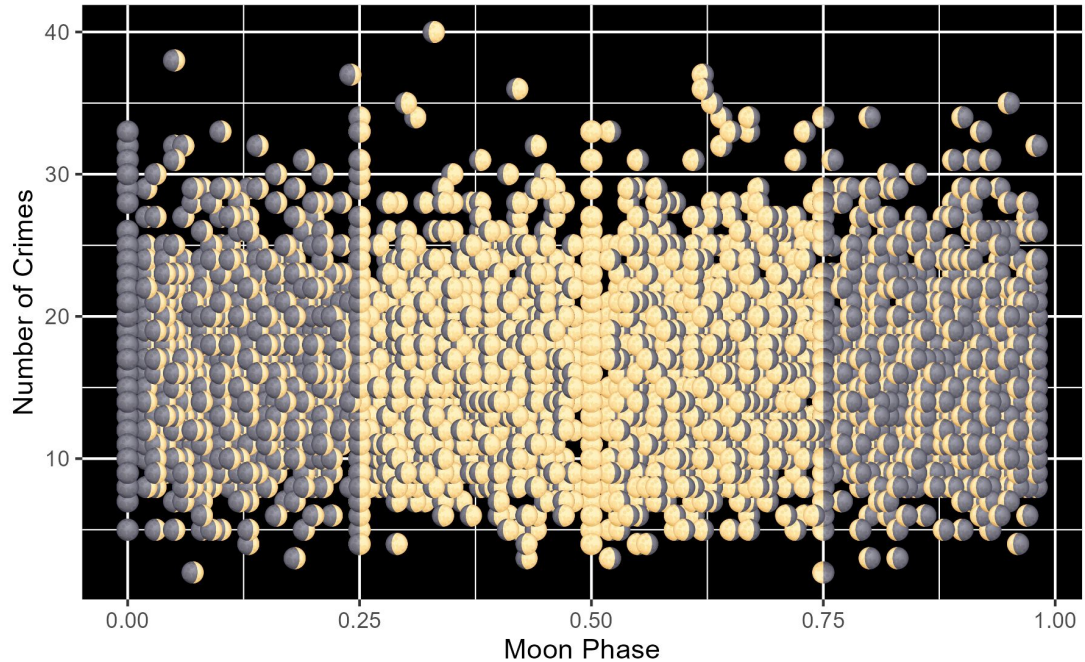
Predicting Crime Type

Random Forest Model

Important Features

- **Time of Day - Late Night: .3099**

- **Ward 28: .0787**

- **Time of Day - Late Morning: .0639**
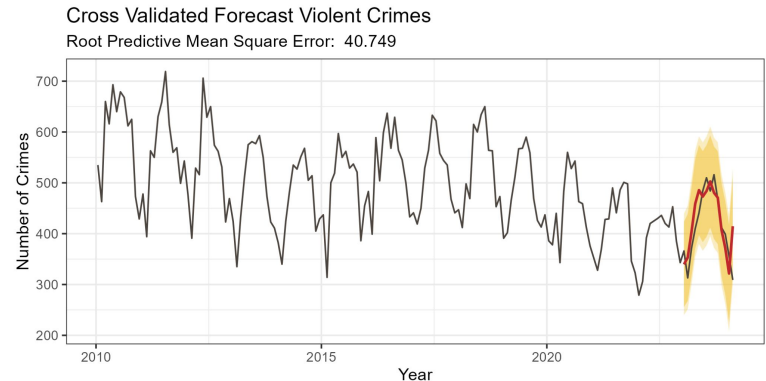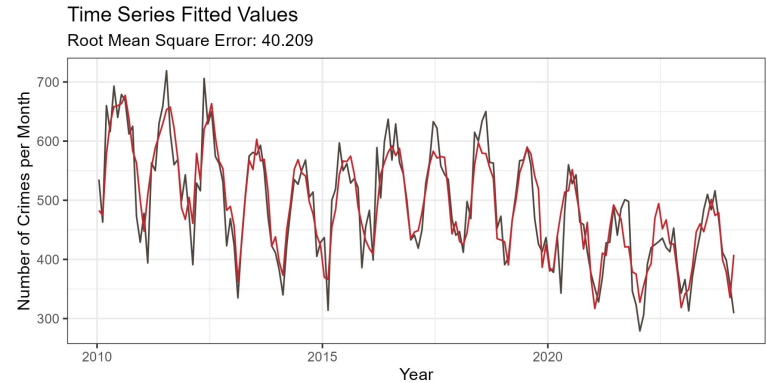
- **Full Moon: .052**

Non-Important Features

- **Other Wards, Beats, and Community Areas**

Does the Moon Affect Crime???

Time Series Model **Results**

	Estimate	Lower	Upper	P-Value
Annual Median Income	-4.384	-7.424	-1.344	0.0048
Max Average Temp	5.595	4.218	6.972	0.0000
Mean UV Index Domestic	7.164	3.235	11.092	0.0004
Mean UV Index Non-Domestic	0.3461	-4.561	5.253	0.89
Max Humidity	0.633	-0.573	1.840	0.3024
Max Precipitation	-0.108	-0.455	0.240	0.5416
Max Wind Speed	-0.689	-1.594	0.216	0.1360

Time Series Fitted Values
Root Mean Square Error: 40.209

Cross Validated Forecast Violent Crimes
Root Predictive Mean Square Error: 40.749

What now?

Median Income

Invest in workforce development programs

Temperature

Have more officers on duty on days that it is forecasted to be warmer outside

Night vs Day

More street lighting in locations that might be dark. Close down bars earlier

Domestic

Spread awareness about resources such as hotlines, domestic violence centers, etc.

Thanks!

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CREDITS: This presentation template was created by **Slidesgo**, and includes icons by **Flaticon**, and infographics & images by **Freepik**

Sources Cited

Moon Icons:
https://icons8.com/icons/set/moon-phases--static--black

Median Household Income Data:
https://www.statista.com/statistics/205818/median-household-income-in-illinois/

List of Violent Crimes:
https://home.chicagopolice.org/statistics-data/statistical-reports/

Police Station Icon:
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Beer Icons:
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Study on Closing Bars:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2089093/

Number of Violent Crimes on Holidays
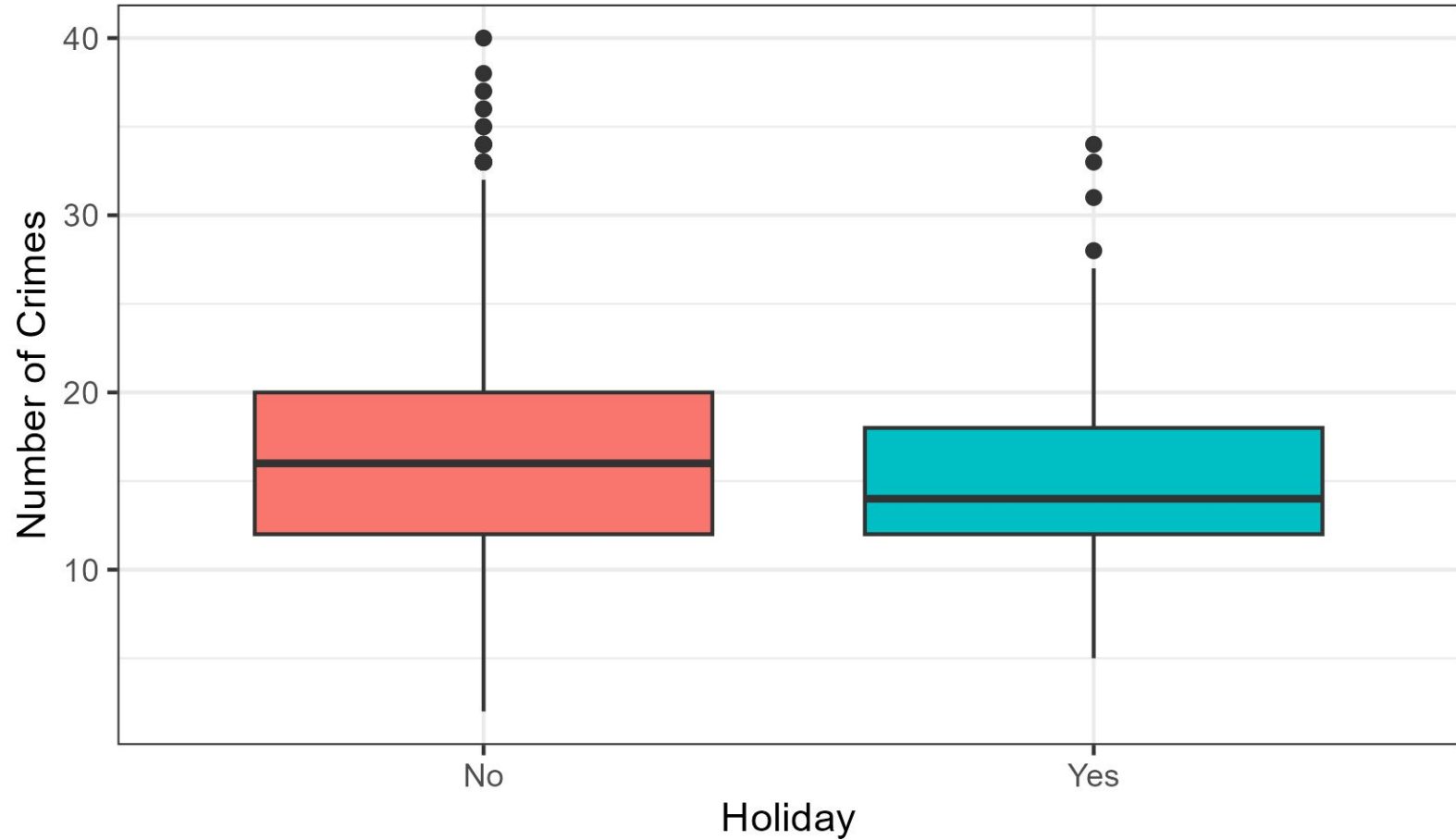
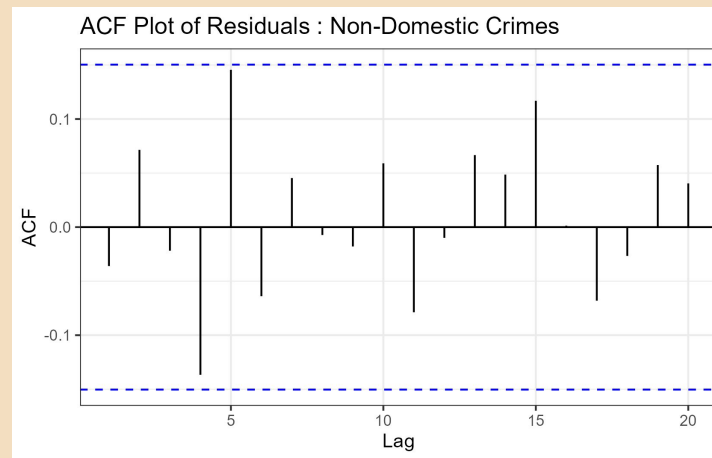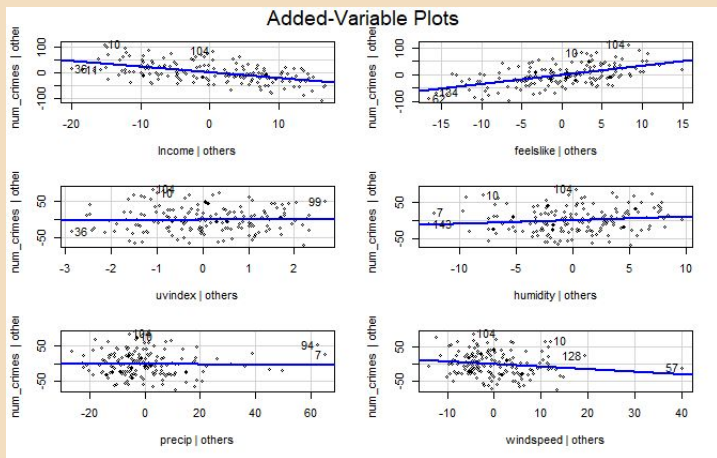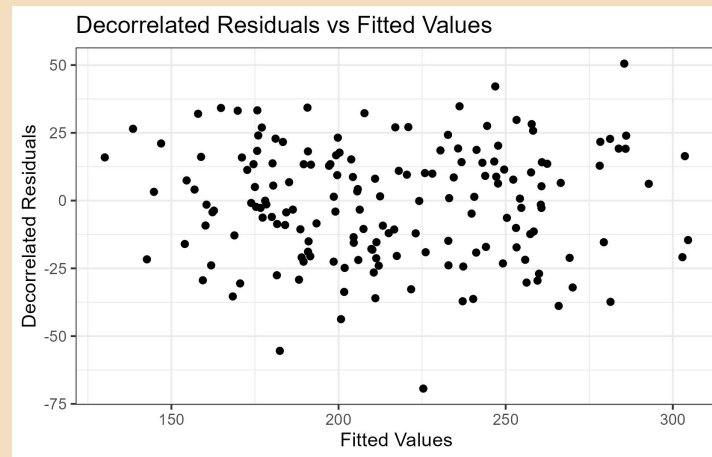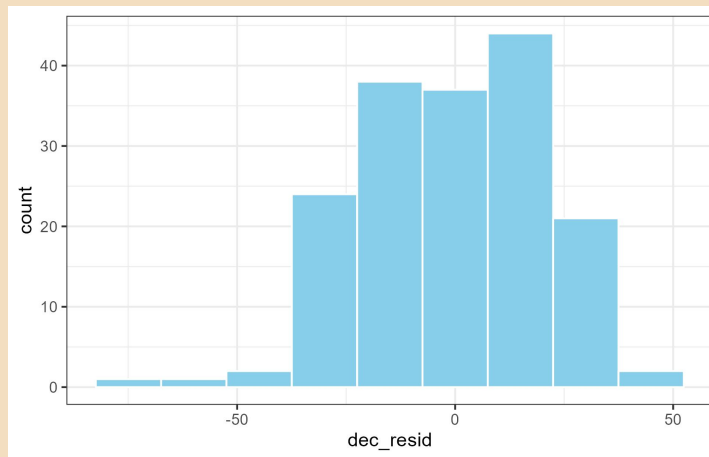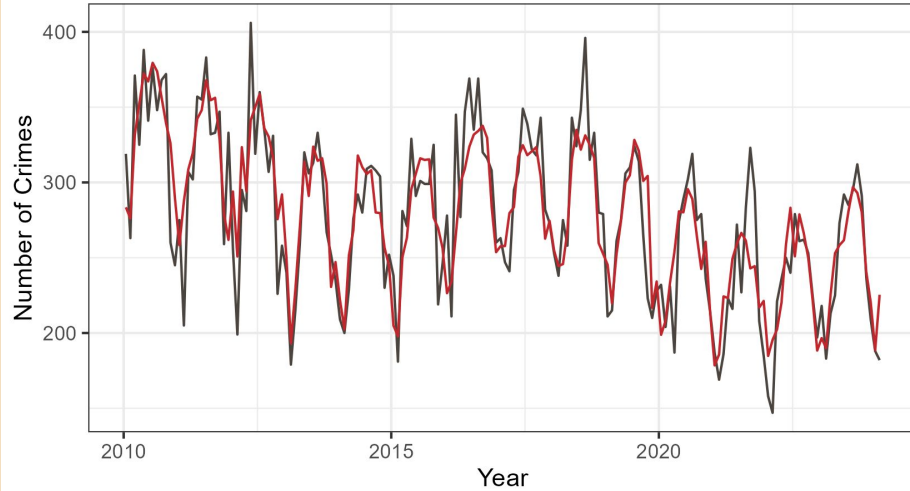Violent Crimes in District 11
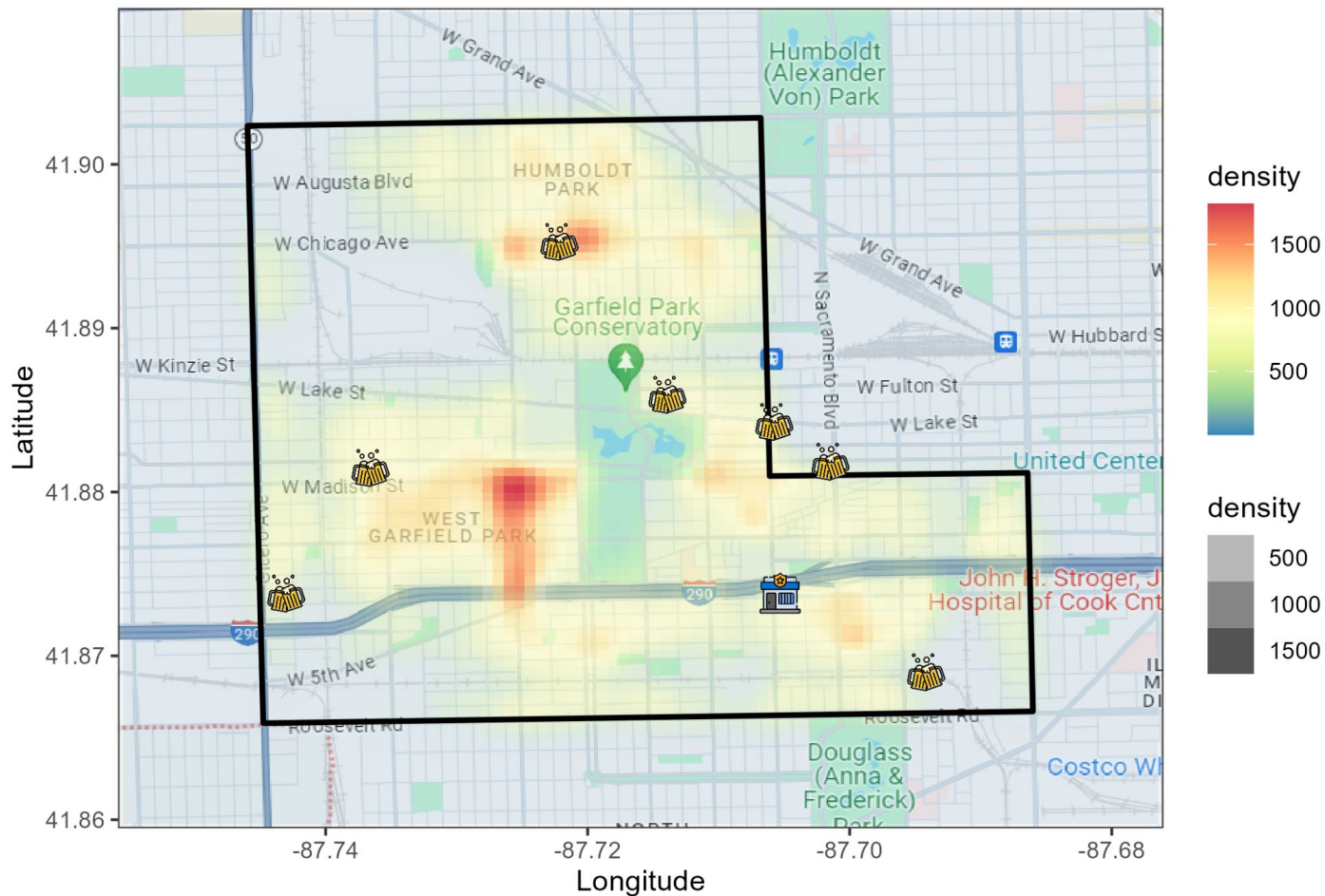
Model Assumptions Non-Domestic
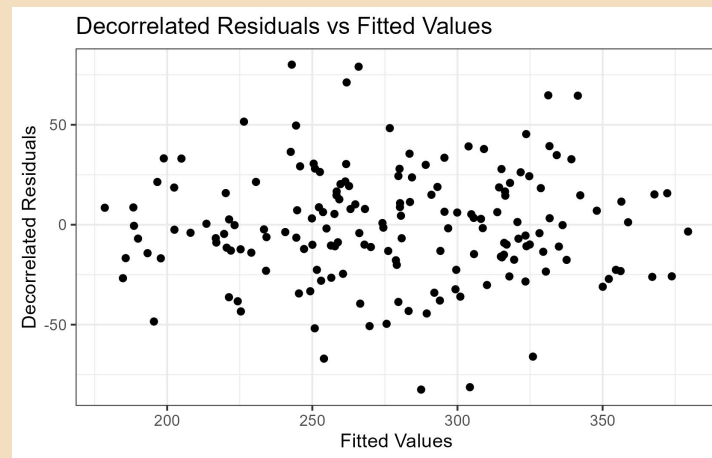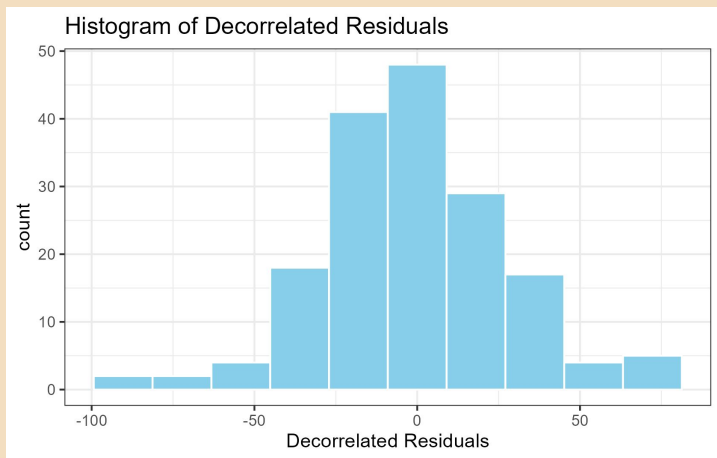
Model Assumptions Domestic

Model Fit