The Influence of Weather on Crime in Oakland

JAIME A. WILLIAMS
GENERAL ASSEMBLY – SF DAT 12
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Outline

- Project Goals

- Data Sources & Preparation

- Data Exploration

- Findings

- Future Exploration

Project Goals

To explore the relationship of temperature and rain on the occurrence of different types of crime in Oakland, CA

Data Sources & Preparation

Crime Data

- Source: City of Oakland Crime Watch Data
  - Tabular format
  - Incomplete reporting of crimes
  - Focus on 2012 & 2013 calendar years
- Create consistent crime type and category classifications
- Remove special characters
- Import CSV

Weather Data

- Source: Weather Underground API
  - Historical daily weather information from OAK Airport
- Pulled individual CSV files from API and merged into a single file

Crime Data

	ID	RawCrimeType	CrimeType	DateTime	Month	Day	WeekDay	DayOfYear	Year	HourOfDay	CaseNumber	Description
0	1	DISORDERLY CONDUCT	DisorderlyConduct	2010-01-01	1	1	4	1	2010	0	12-010683	DISTURB THE PEACE
1	2	DISORDERLY CONDUCT	DisorderlyConduct	2010-01-01	1	1	4	1	2010	0	13-063969	DISTURB THE PEACE
2	3	FORGERY & COUNTERFEITING	ForgeryCounterfeiting	2010-01-01	1	1	4	1	2010	0	12-006709	USE ANOTHERS PERSONAL IDENTIFICATION TO OBTAIN...
3	4	FORGERY & COUNTERFEITING	ForgeryCounterfeiting	2010-01-01	1	1	4	1	2010	0	12-009479	USE ANOTHERS PERSONAL IDENTIFICATION TO OBTAIN...
4	5	FORGERY & COUNTERFEITING	ForgeryCounterfeiting	2010-01-01	1	1	4	1	2010	0	12-023163	OBT CREDIT ETC OTHERS ID

Weather Data

	Max TemperatureF	Mean TemperatureF	Min TemperatureF	Max Dew PointF	MeanDew PointF	Min DewpointF	Max Humidity	Mean Humidity	Min Humidity	Max Sea Level PressureIn	...	Max VisibilityMiles	
2013-12-27	58	47	35	43	39	32	92	76	59	30.24	...	10	
2013-12-28	62	47	31	41	34	30	92	62	32	30.16	...	10	
2013-12-29	72	53	34	40	26	15	76	45	13	30.19	...	10	
2013-12-30	61	48	34	45	38	30	93	67	40	30.27	...	10	
2013-12-31	59	48	36	44	38	34	92	68	44	30.28	...	10	

Crime Classifications

Personal	Property	Quality of Life	Other
• Assault & Battery • Carjacking • Child/Elder Abuse • Domestic Violence • Homicide • Kidnapping • Rape/Attempted Rape • Robbery	• Arson • Burglary • Embezzlement • Forgery/Counterfeiting • Fraud • Possession of Stolen Property • Theft • Vandalism • Vehicle Theft	• Curfew/Loitering • Disorderly Conduct • Disturbing the Peace • Drug Possession/Sale • DUI • Gambling • Illegal Weapons Possession • Obstruction/Resisting Arrest • Other Sex Offenses • Pandering • Prostitution • Public Drunkenness • Traffic	• Bomb Threat • Brandishing Weapon • Firearm Discharge • Other • Threats • Unknown • Warrant

Crime over Time by Category

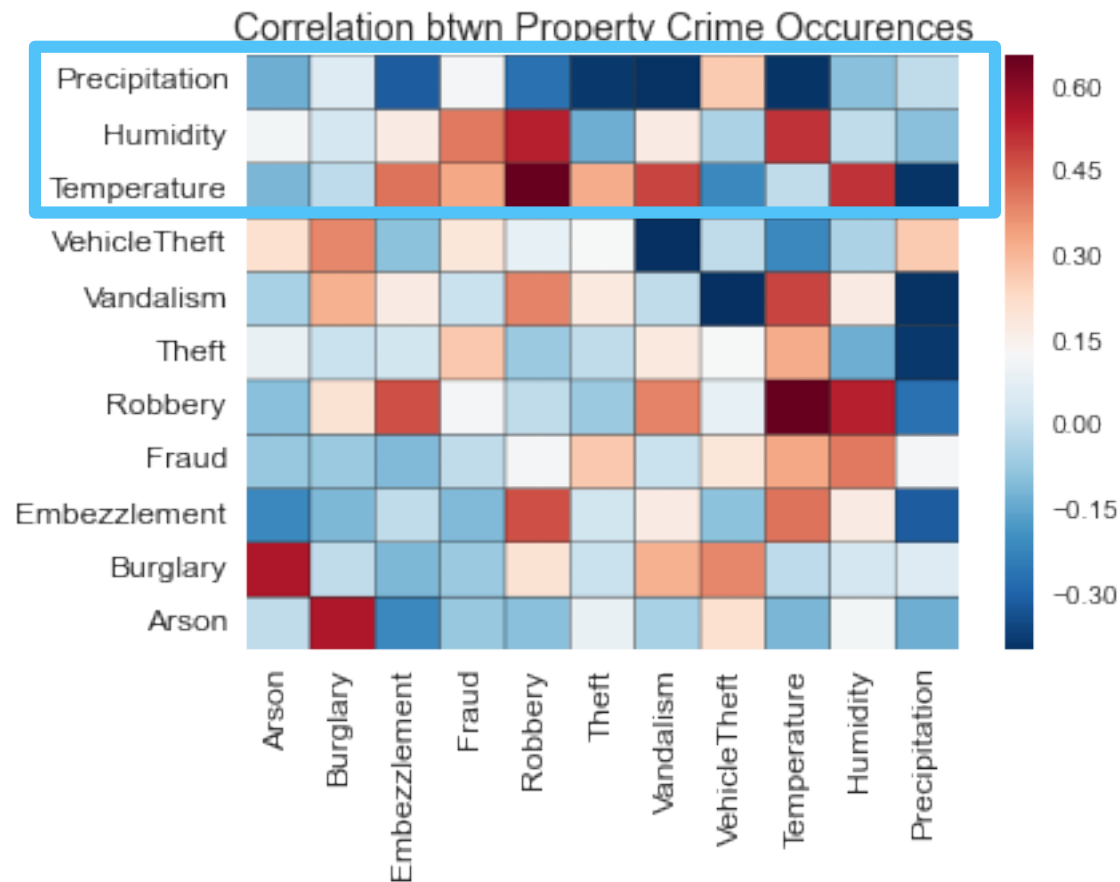# Crime over Time by Category
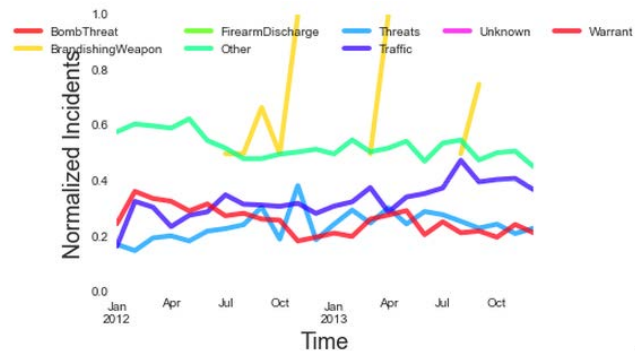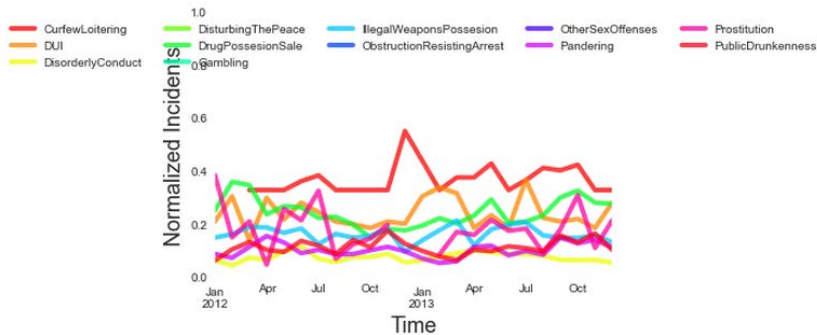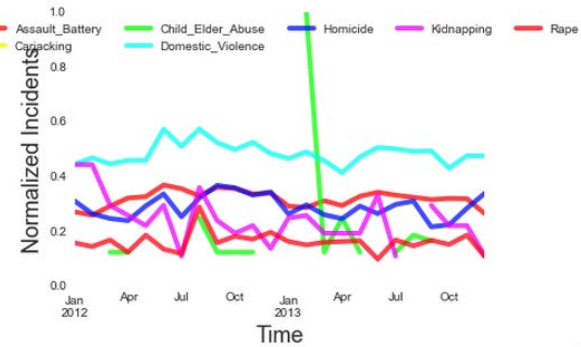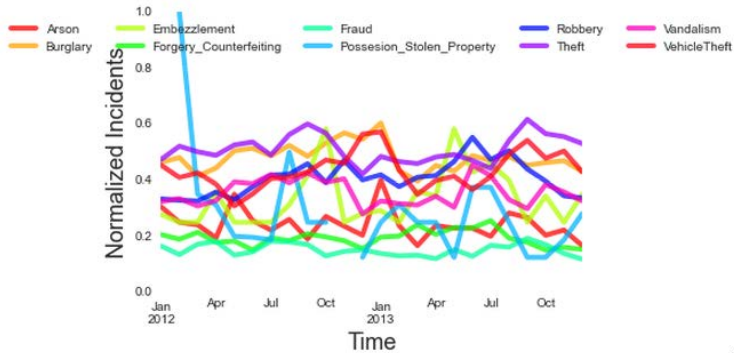
Crime by Hour of Day Analysis
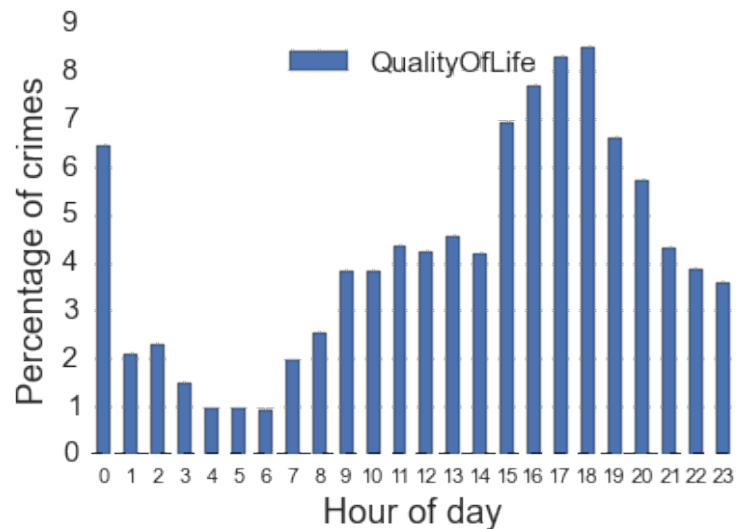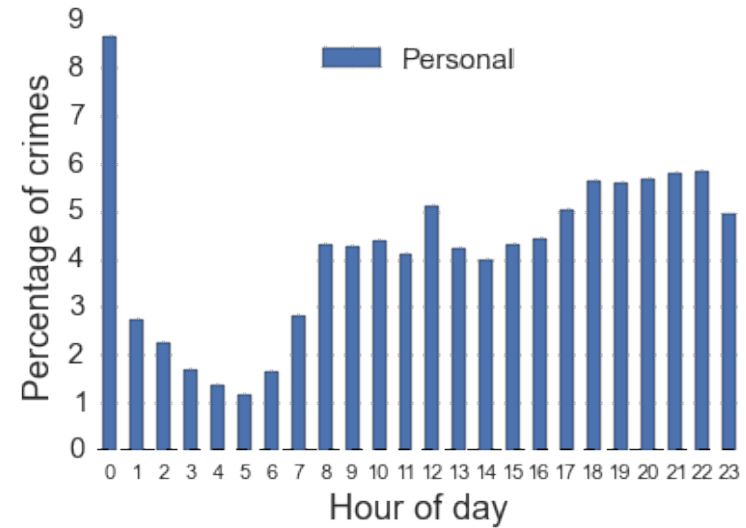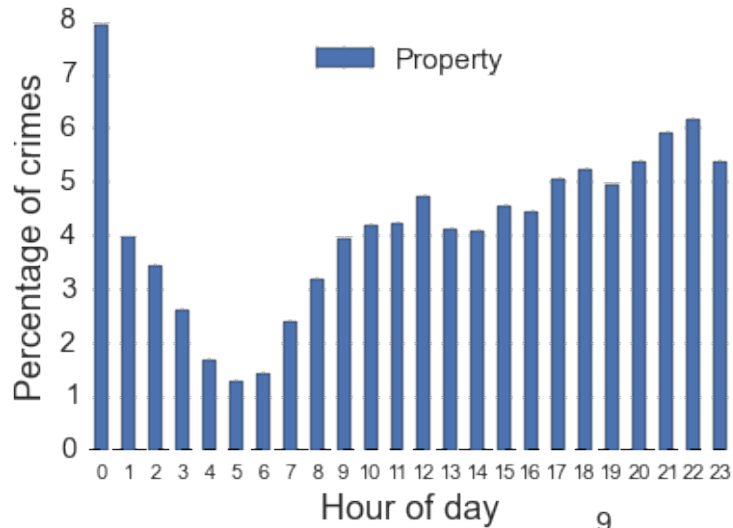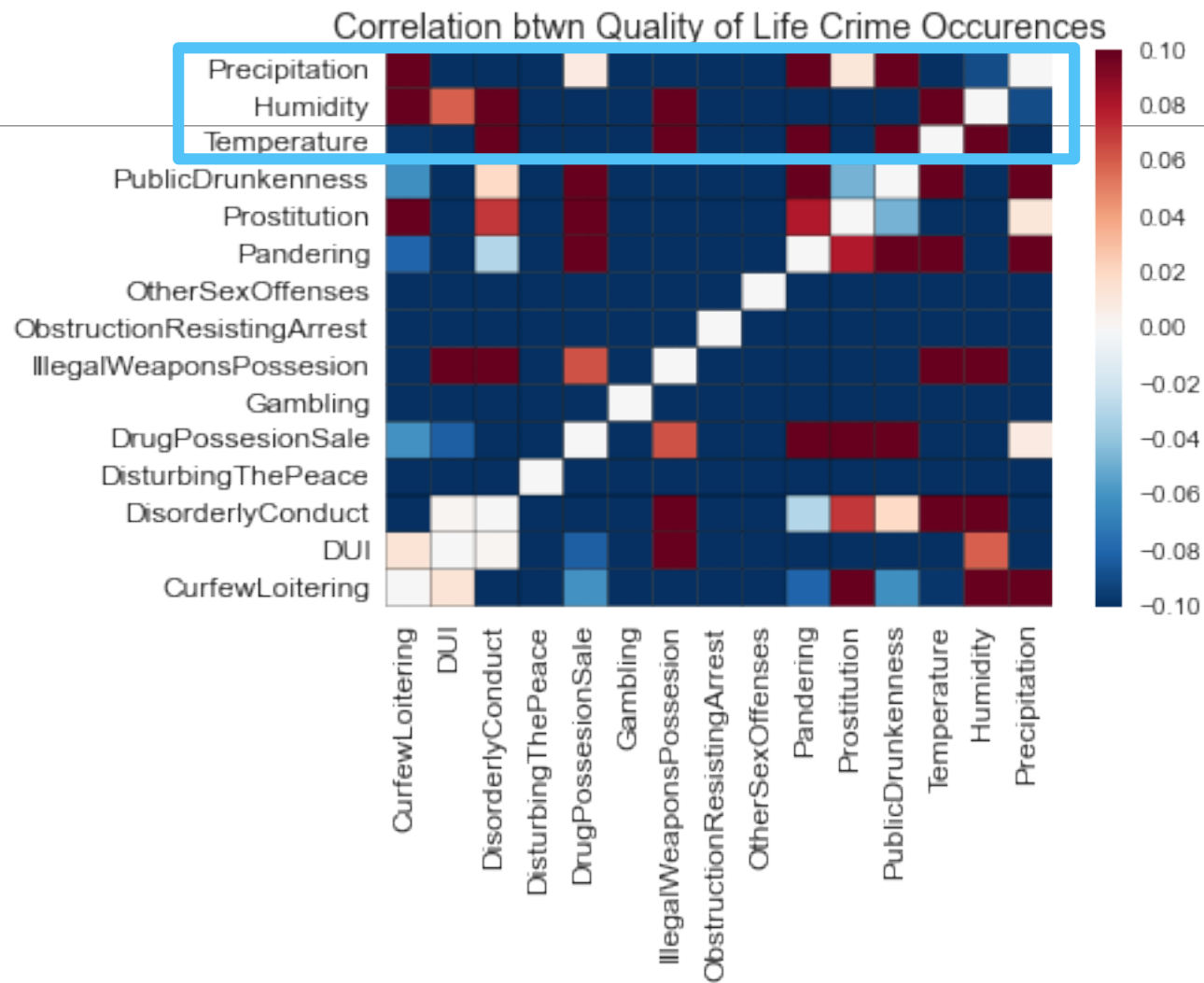
Crime by Month Analysis
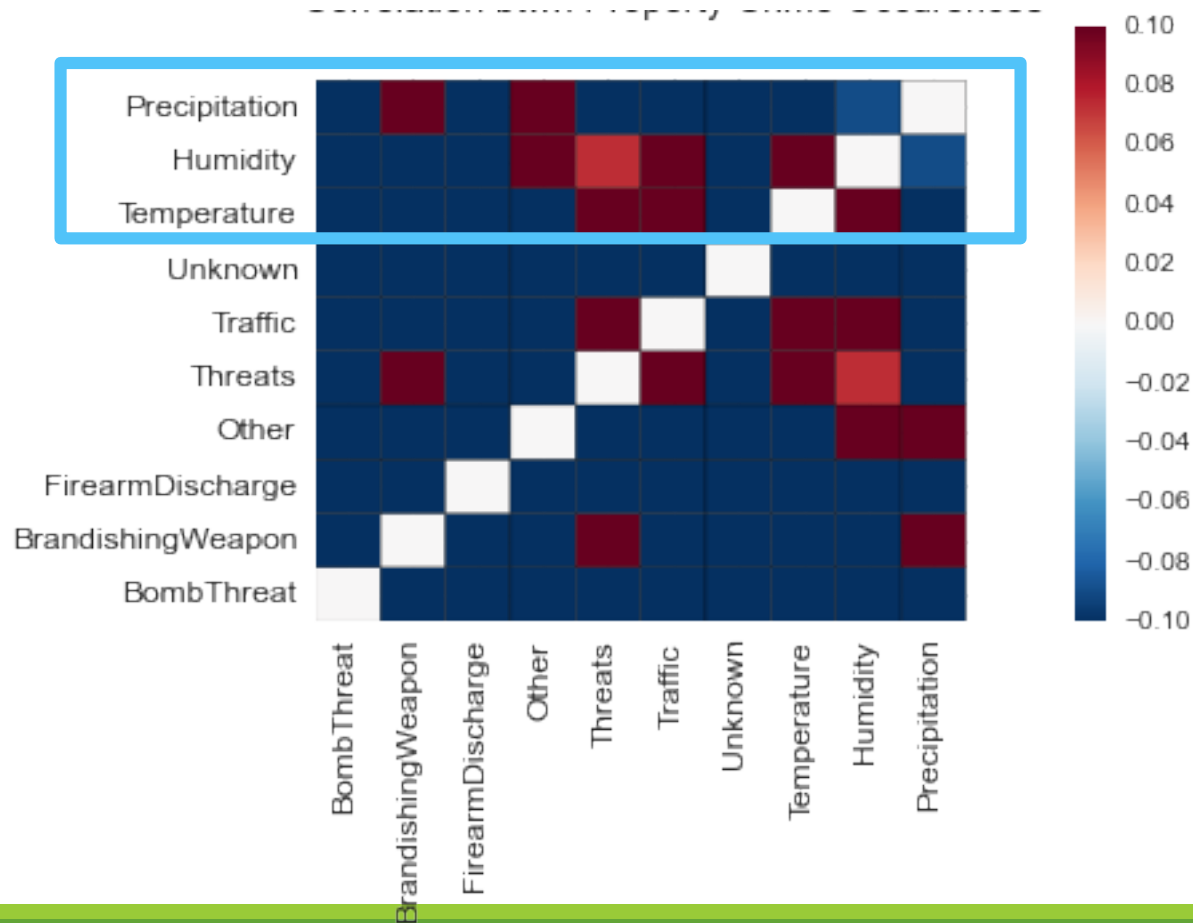
Crime by Day of the Week
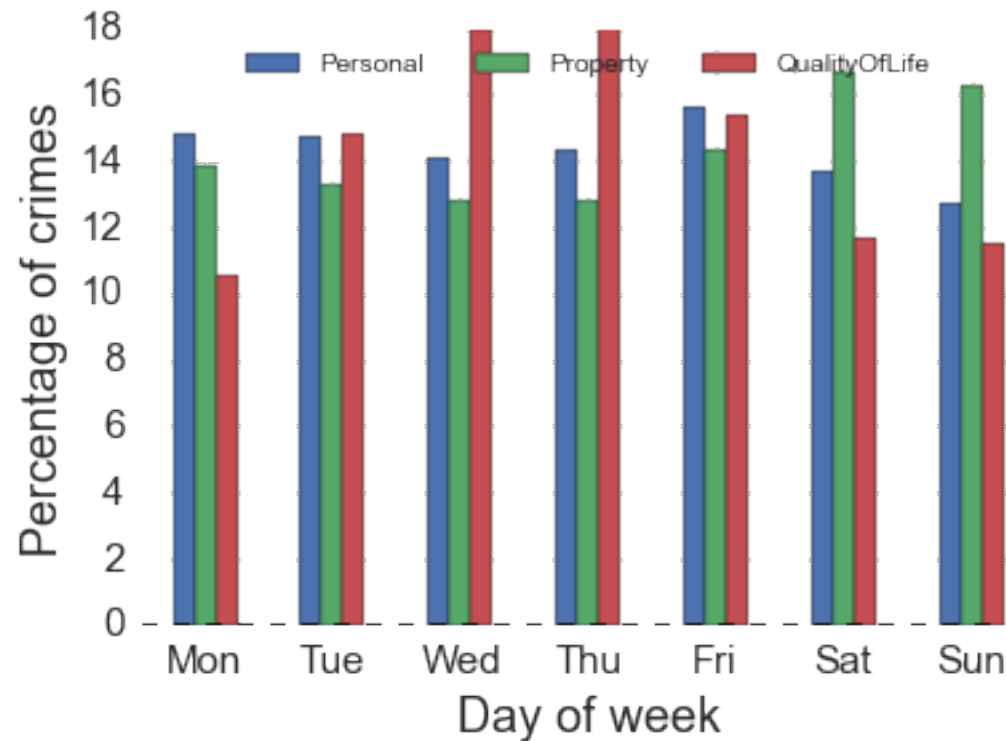
Crime Correlation - Property

Correlation btwn Property Crime Occurences
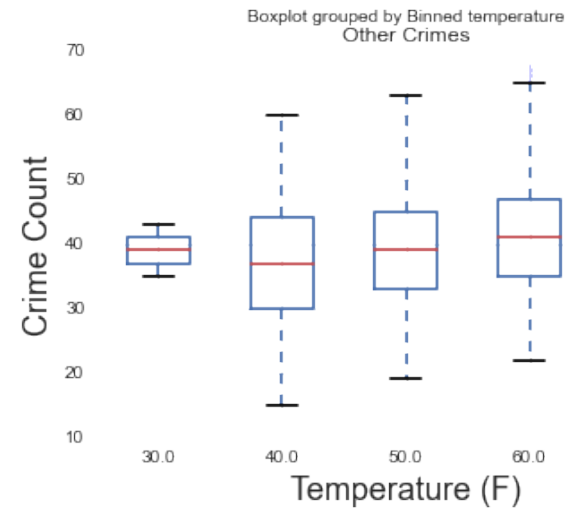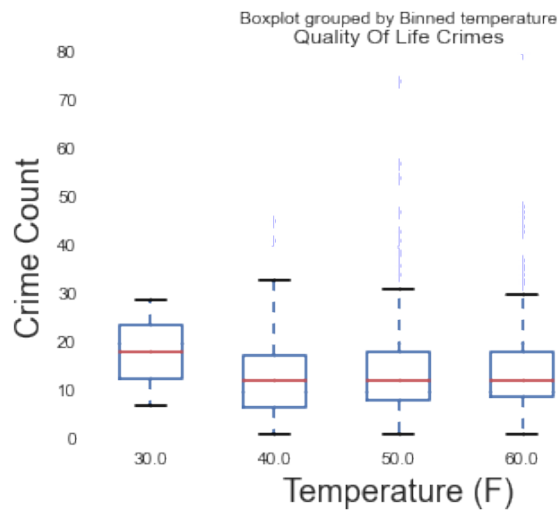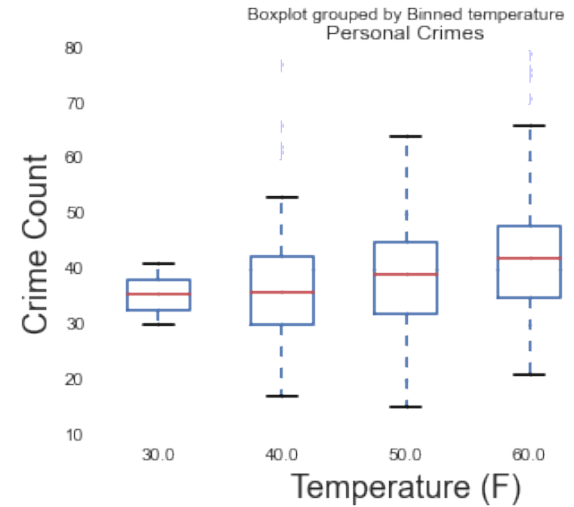
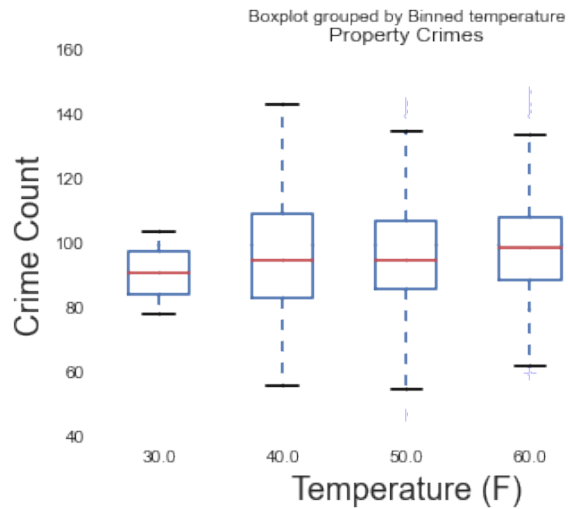# Crime Correlation - Personal

Correlation btwn Personal Crime Occurences
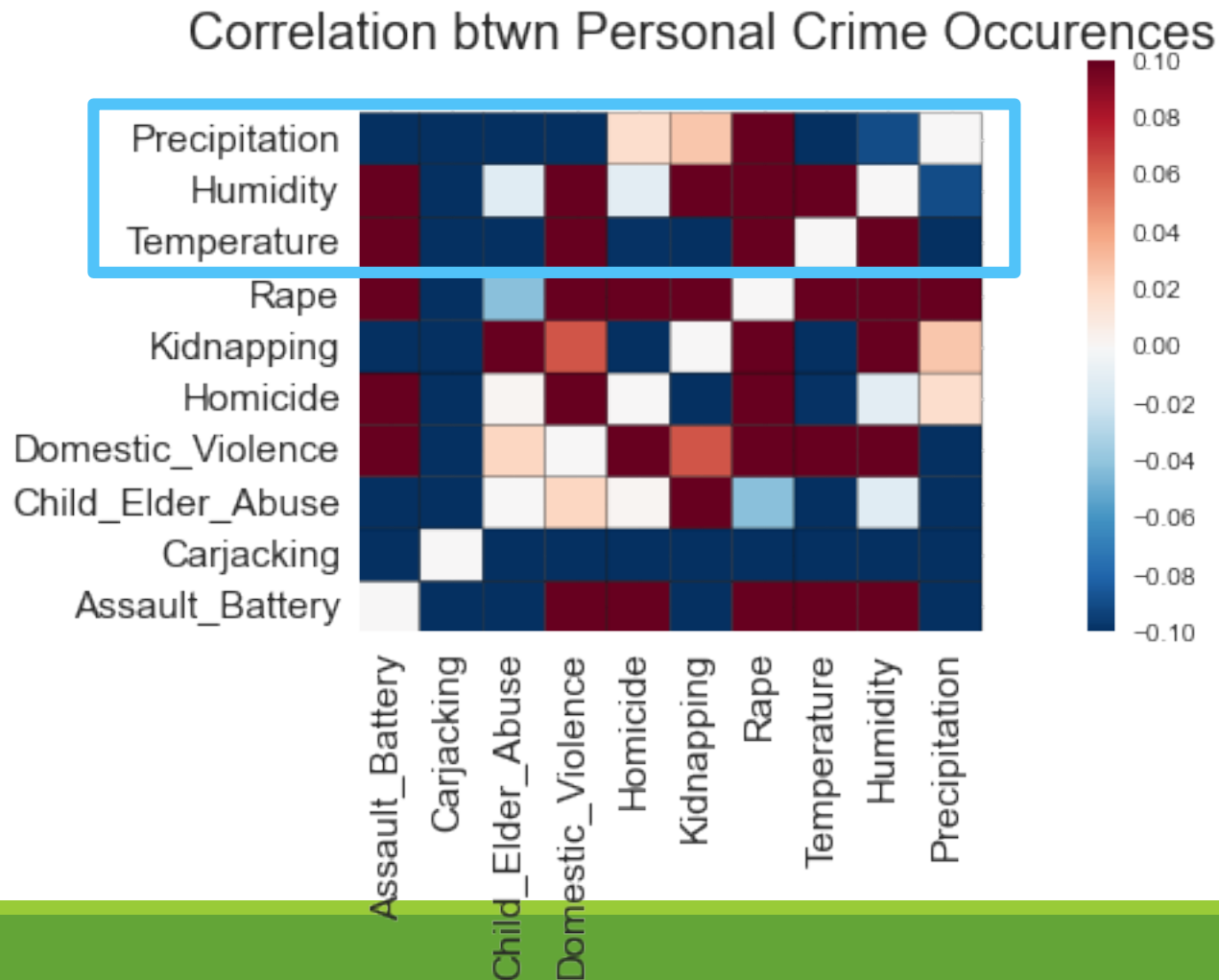
Crime Correlation – Quality of Life

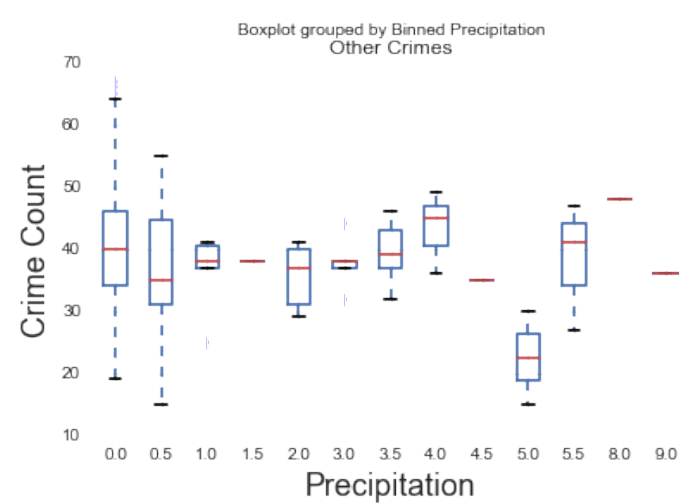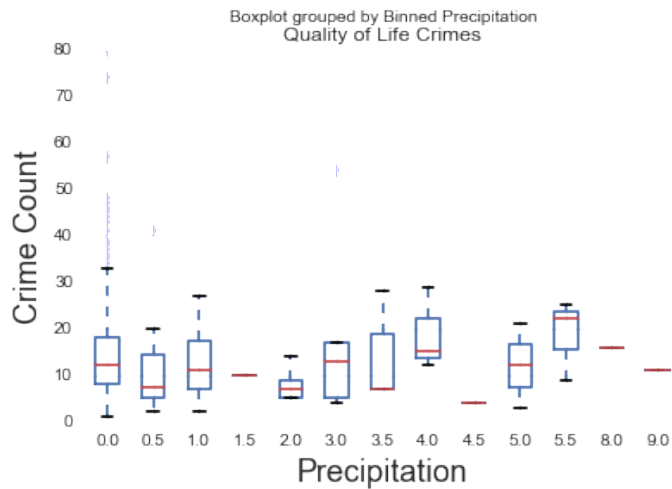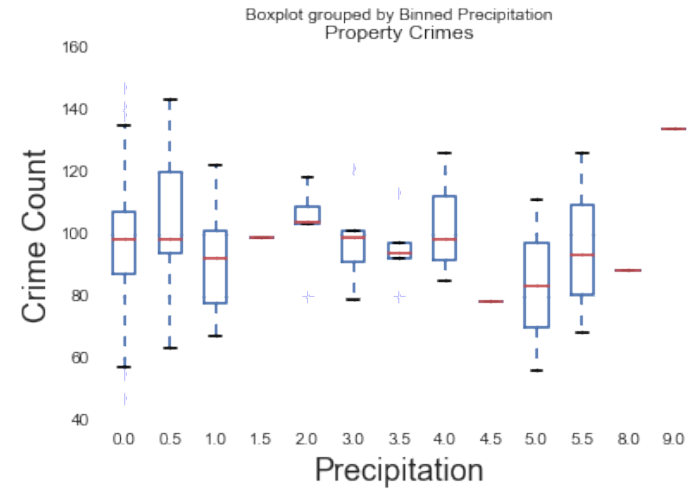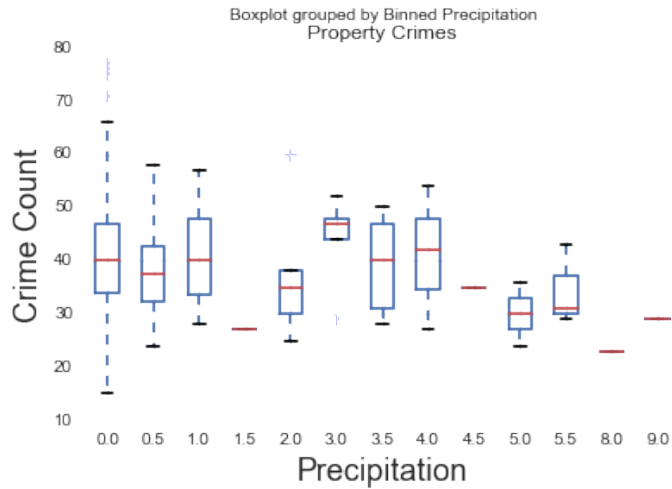Correlation btwn Quality of Life Crime Occurences

Crime Correlation - Other

Temperature Analysis

Rain Analysis

Future Exploration

Refine weather data
  ◦ Use hourly data
  ◦ Use closest weather station

Expand usable crime dataset (more years)

Validate model results against numbers federally reported to FBI

Predict changes in crime trends based on drought

Predict changes in crime trends based on increase in temperatures

Credits

Several methods were adapted from Brian Keegan's analysis of **Heat and Violence in Chicago**