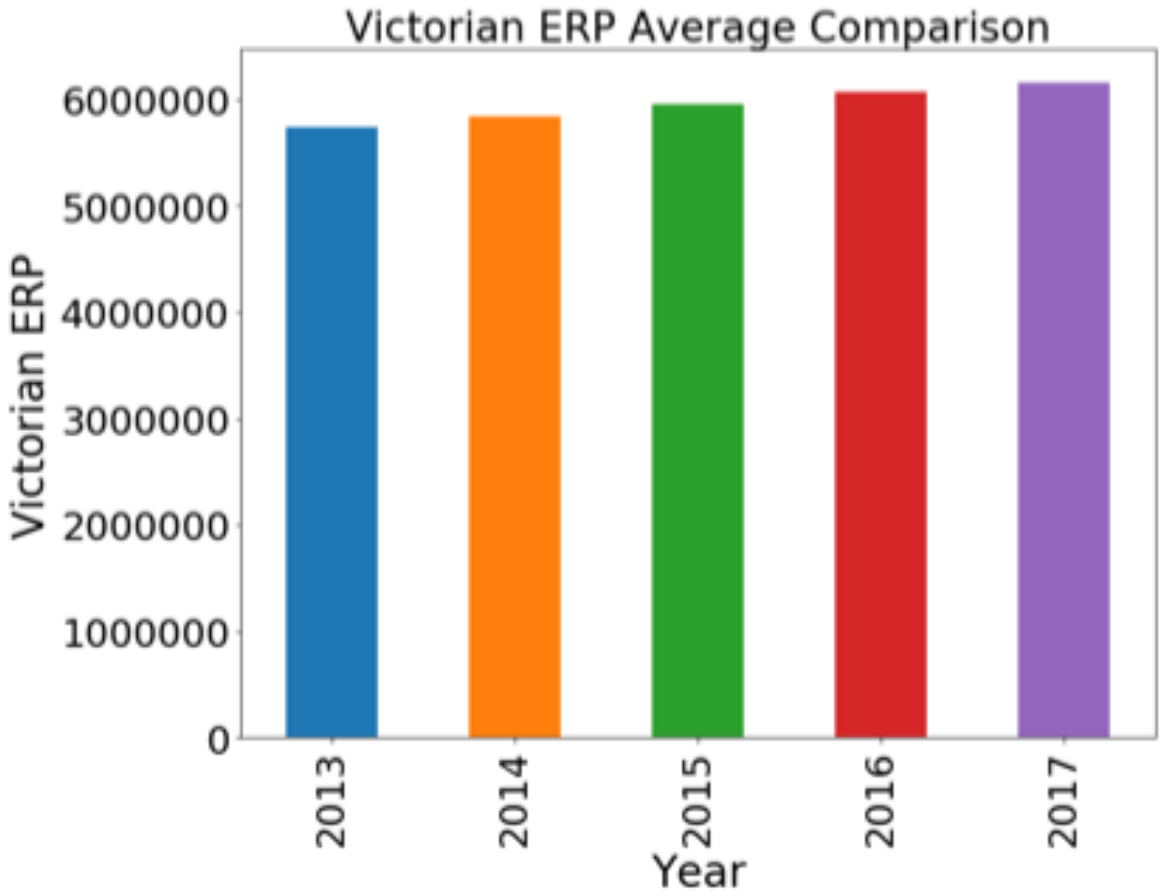
Crime Throughout Victoria

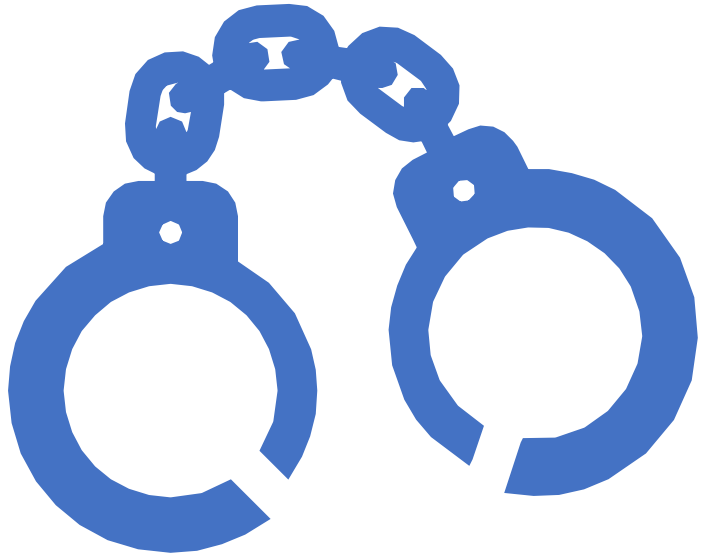
an Investigation by Deevesh Shanmuganathan

Why is crime an important area of focus?



Key Investigation Prompts

- What is the most prevalent type of crime?
- How closely related are specific locations and population density to the occurrence of certain types of crimes
- Is there a way to distribute government resources to combat crime more efficiently?



The Types of Crime

- A - Crimes against the person
- B - Property and deception offences
- C - Drug offences
- D - Public order and security offences
- E - Justice procedures offences
- F - Other offences

The datasets

#1- Offence count per LGA

	Jul - Jun reference period	Police Region	Police Service Area	Local Government Area	CSA Offence Division	Offence Subdivision	Offence Group	LGA Offence Count	LGA ERP	Victorian ERP	LGA offence Rate per 100,000 population
0	2017-01-01	1 North West Metro	Banyule	Banyule	A Crimes against the person	A10 Homicide and related offences	A10 Homicide and related offences	2	128469	6157538	7517.766932
1	2017-01-01	1 North West Metro	Banyule	Banyule	A Crimes against the person	A20 Assault and related offences	A211 FV Serious assault	143	128469	6157538	7517.766932
2	2017-01-01	1 North West Metro	Banyule	Banyule	A Crimes against the person	A20 Assault and related offences	A212 Non-FV Serious assault	121	128469	6157538	7517.766932

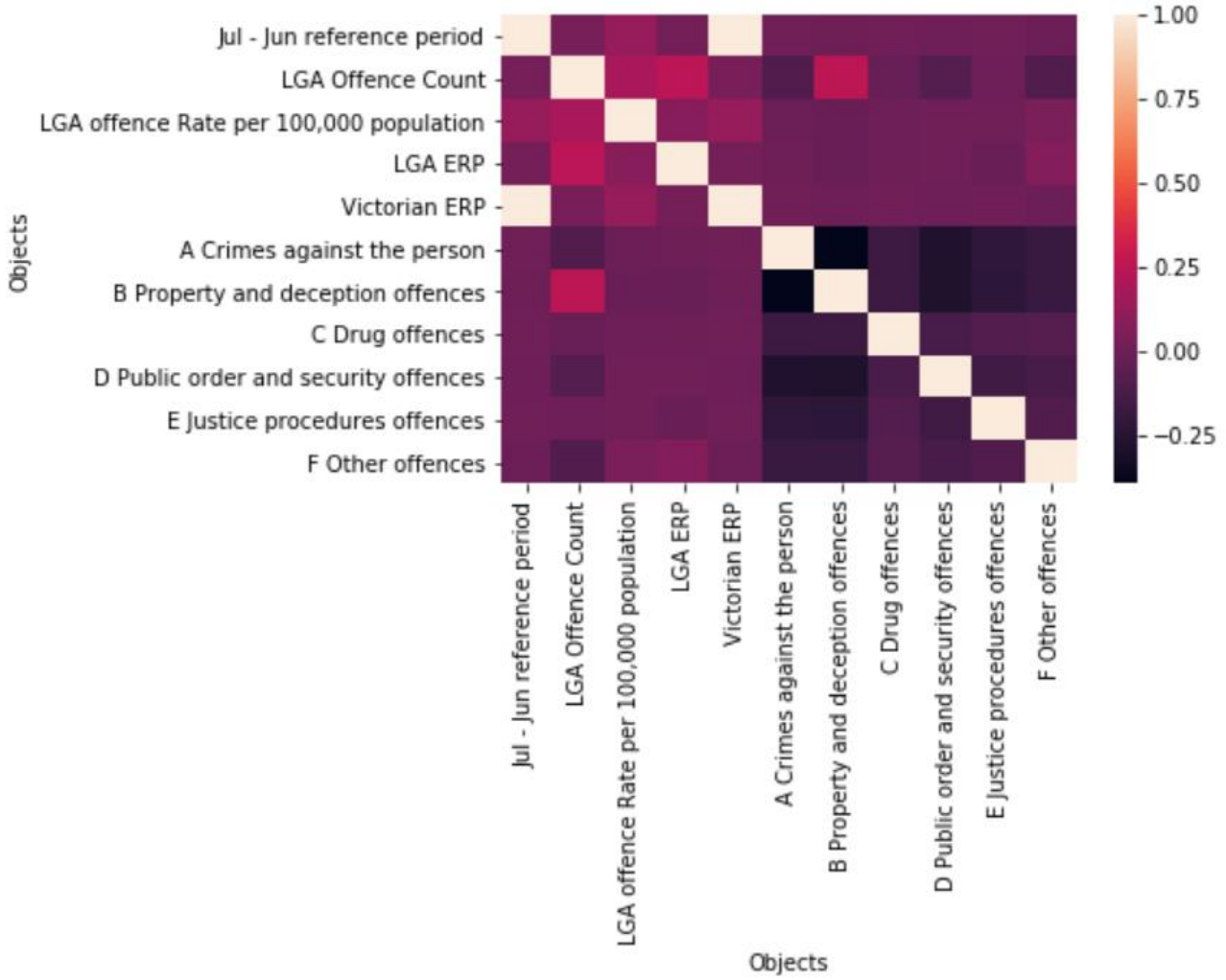
#2- Offence rate per LGA

	Jul - Jun reference period	Police Region	Local Government Area	Rate per 100,000 population
0	2017	1 North West Metro	Banyule	7517.766932
1	2017	1 North West Metro	Brimbank	8793.663288
2	2017	1 North West Metro	Darebin	10458.570040
3	2017	1 North West Metro	Hobsons Bay	6697.799521
4	2017	1 North West Metro	Hume	10656.925790
5	2017	1 North West Metro	Maribyrnong	9889.972208

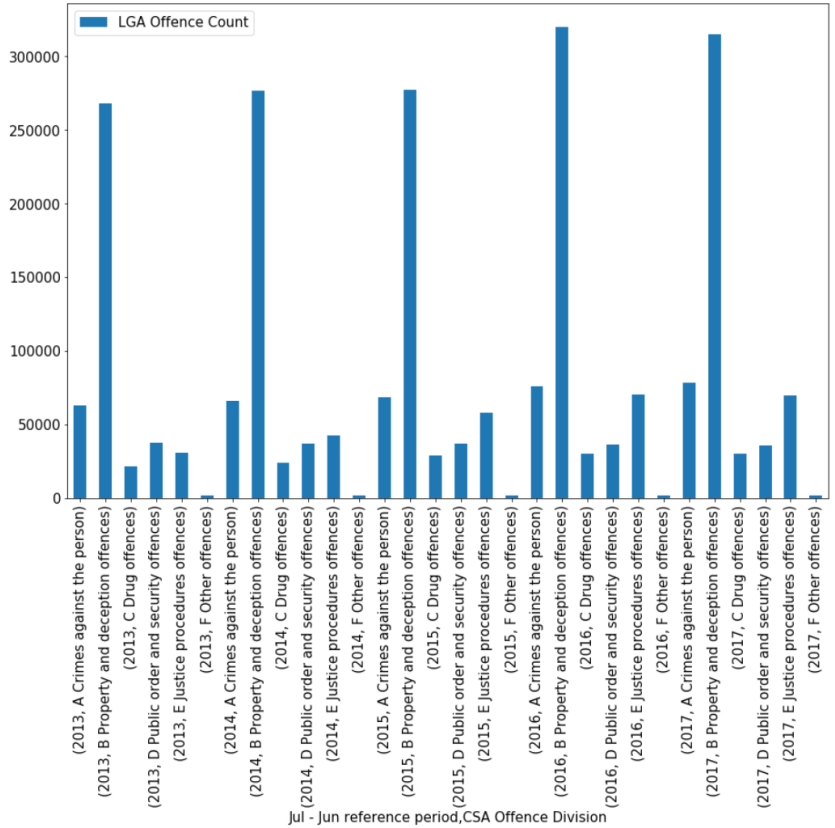
#3 - Property offences by location

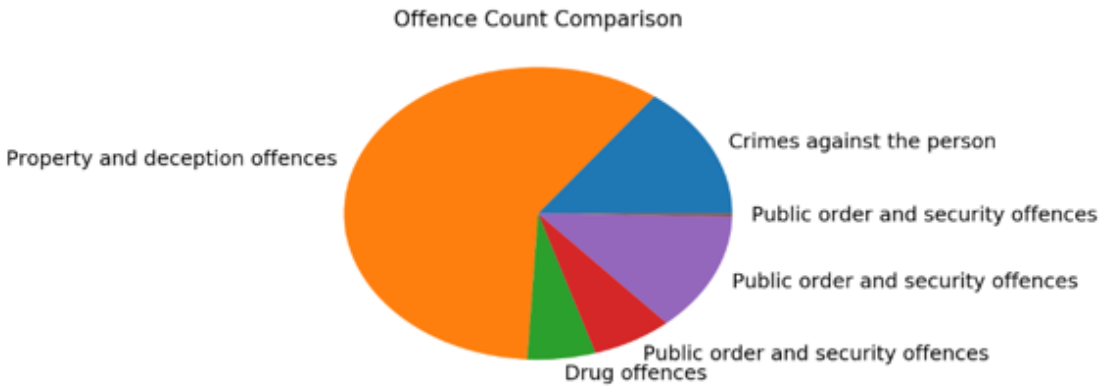
	Jul - Jun reference period	Offence Subdivision	Offence Group	Location Division	Location Subdivision	Location Group	Offence Count
0	2017	B10 Arson	B11 Cause damage by fire	1 Residential	11 Dwelling - private	111 Flat/Unit/Apartment	73
1	2017	B10 Arson	B11 Cause damage by fire	1 Residential	11 Dwelling - private	112 House	330
2	2017	B10 Arson	B11 Cause damage by fire	1 Residential	11 Dwelling - private	113 Bungalow	5
3	2017	B10 Arson	B11 Cause damage by fire	1 Residential	11 Dwelling - private	114 Caravan/Mobile Home	9
4	2017	B10 Arson	B11 Cause damage by fire	1 Residential	11 Dwelling - private	115 Houseboat	1

Offence Count Heatmap

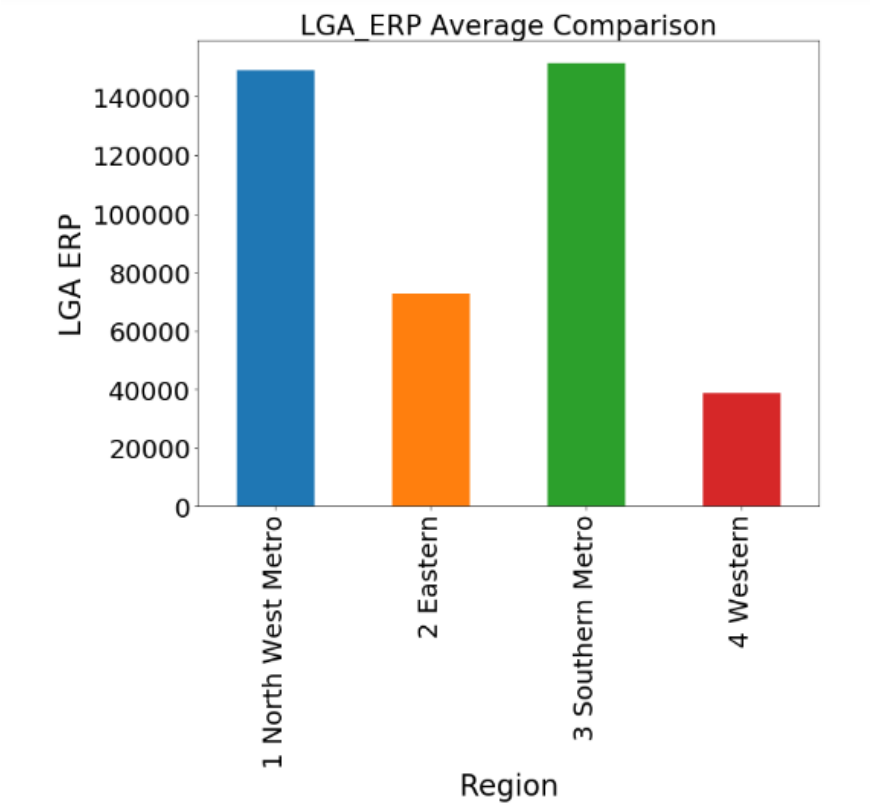


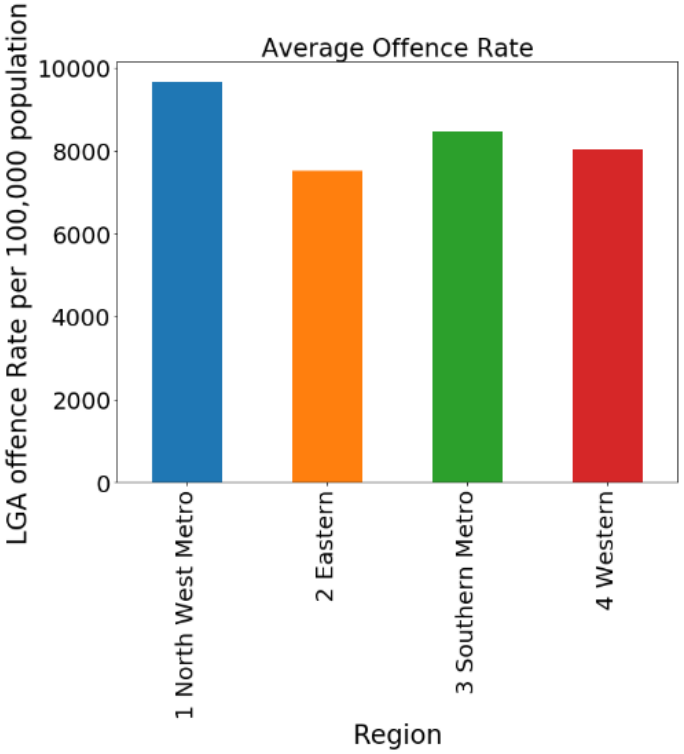
Proportion of Crime in Victoria

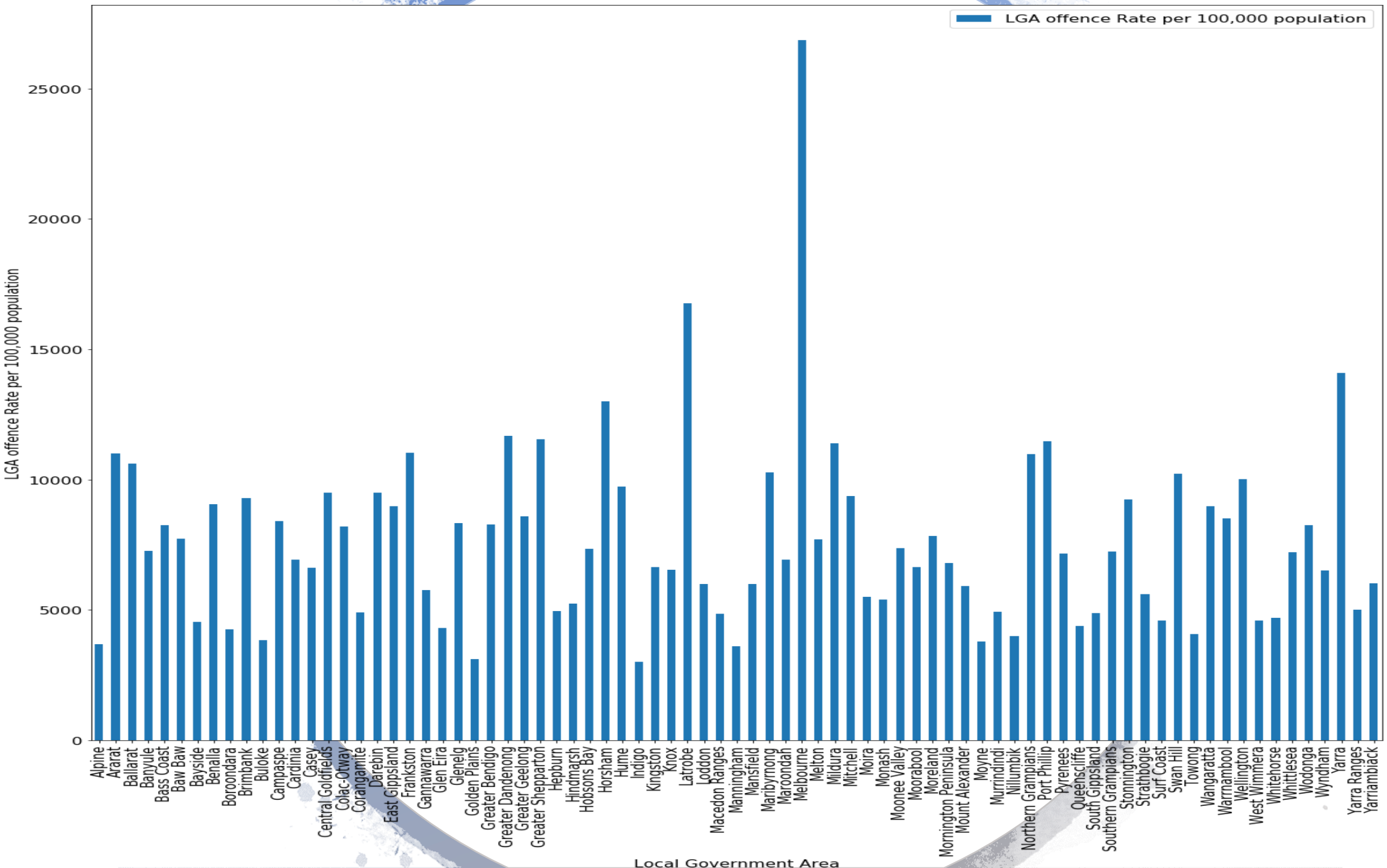




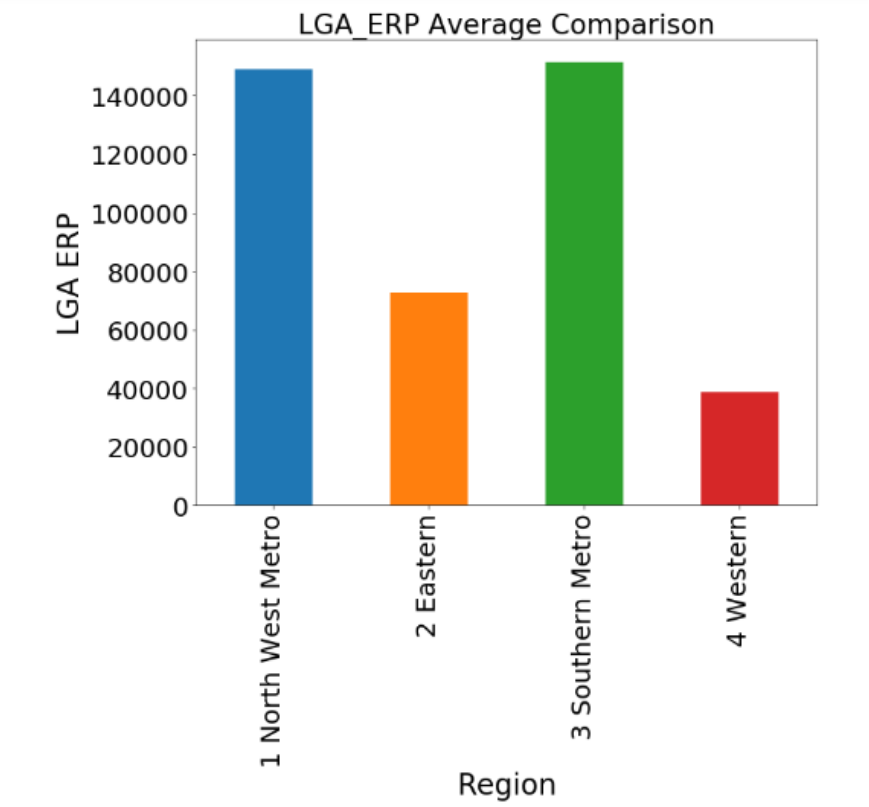
Population vs Crime Rate

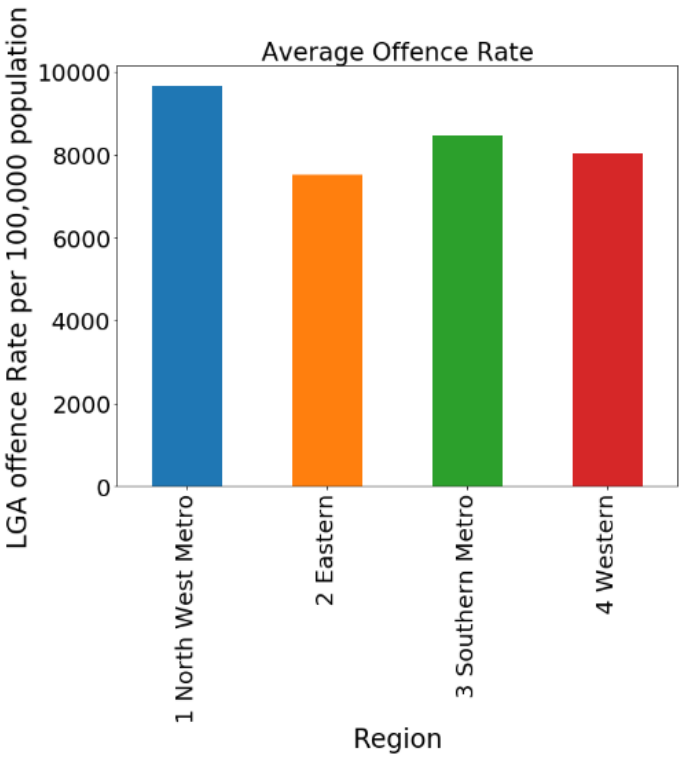




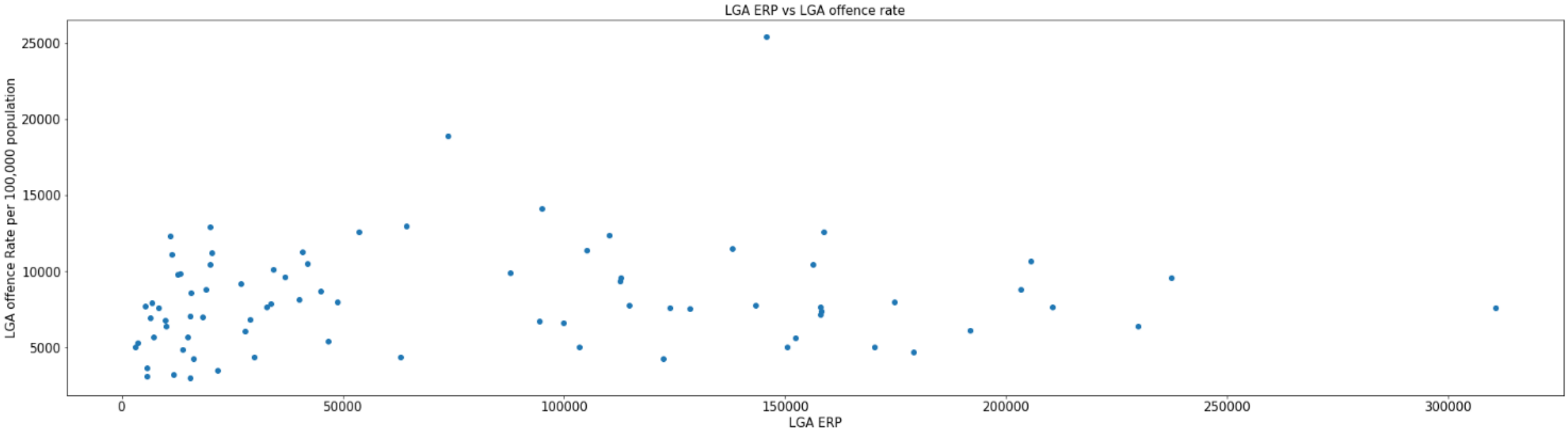

LGA offence Rate per 100,000 population
LGA offence Rate per 100,000 population
0
5000
10000
15000
20000
25000
Alpine
Ararat
Ballarat
Banyule
Bass Coast
Baw Baw
Bayside
Benalla
Boroondara
Brimbank
Buloke
Campaspe
Cardinia
Casey
Central Goldfields
Colac-Otway
Corangamite
Darebin
East Gippsland
Frankston
Gannawarra
Glen Eira
Glenelg
Golden Plains
Greater Bendigo
Greater Dandenong
Greater Geelong
Greater Shepparton
Hepburn
Hindmarsh
Hobsons Bay
Horsham
Hume
Indigo
Kingston
Knox
Latrobe
Loddon
Macedon Ranges
Manningham
Mansfield
Maribyrnong
Maroondah
Melbourne
Melton
Mildura
Mitchell
Moira
Monash
Moonee Valley
Moorabool
Moreland
Mornington Peninsula
Mount Alexander
Moyne
Murrindindi
Nillumbik
Northern Grampians
Port Phillip
Pyrenees
Queenscliffe
South Gippsland
Southern Grampians
Stonnington
Strathbogie
Surf Coast
Swan Hill
Towong
Wangaratta
Warrnambool
Wellington
West Wimmera
Whitehorse
Whittlesea
Wodonga
Wyndham
Yarra
Yarra Ranges
Yarriambiack
Local Government Area

Population vs Offence Rate Per Region

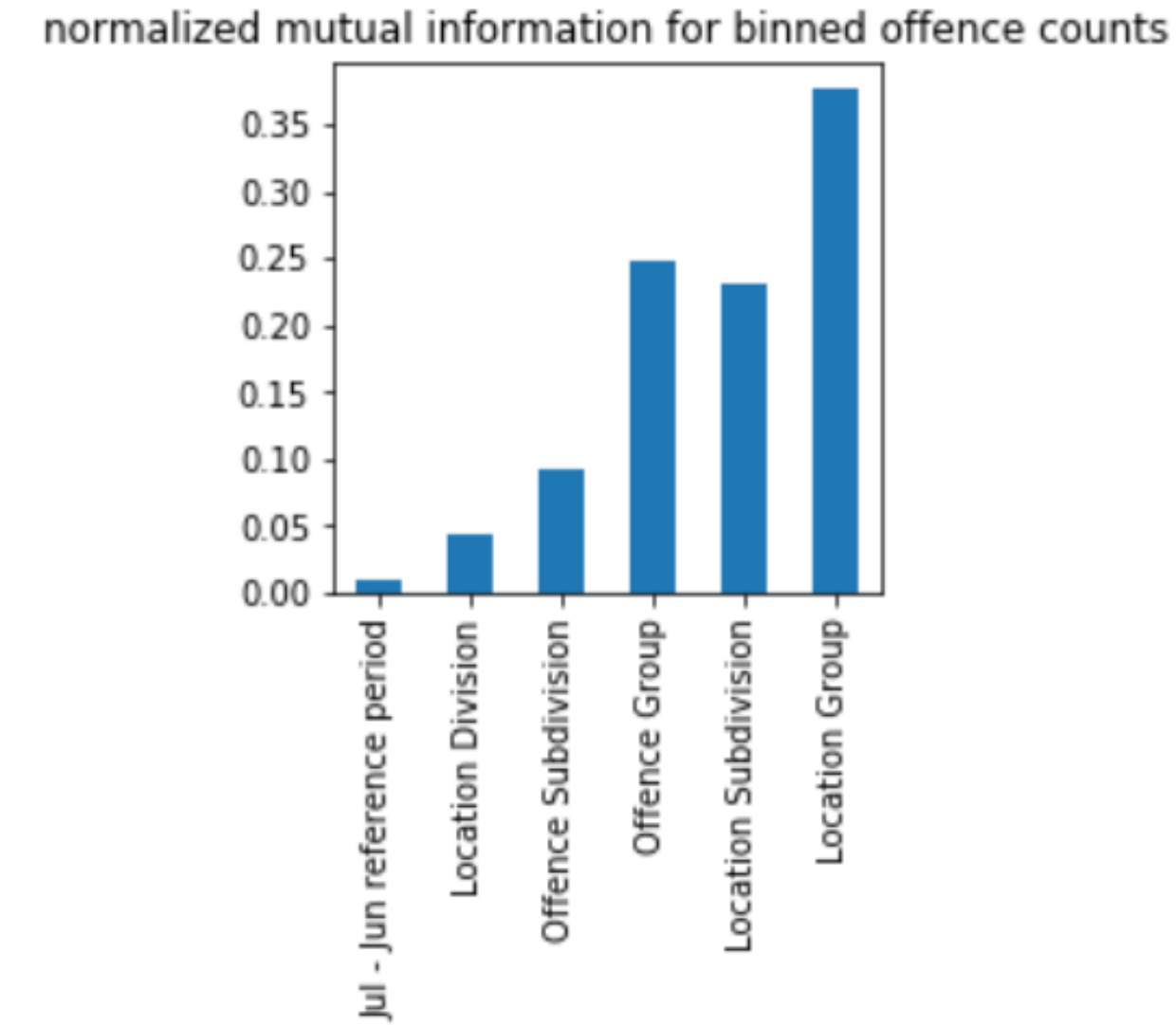


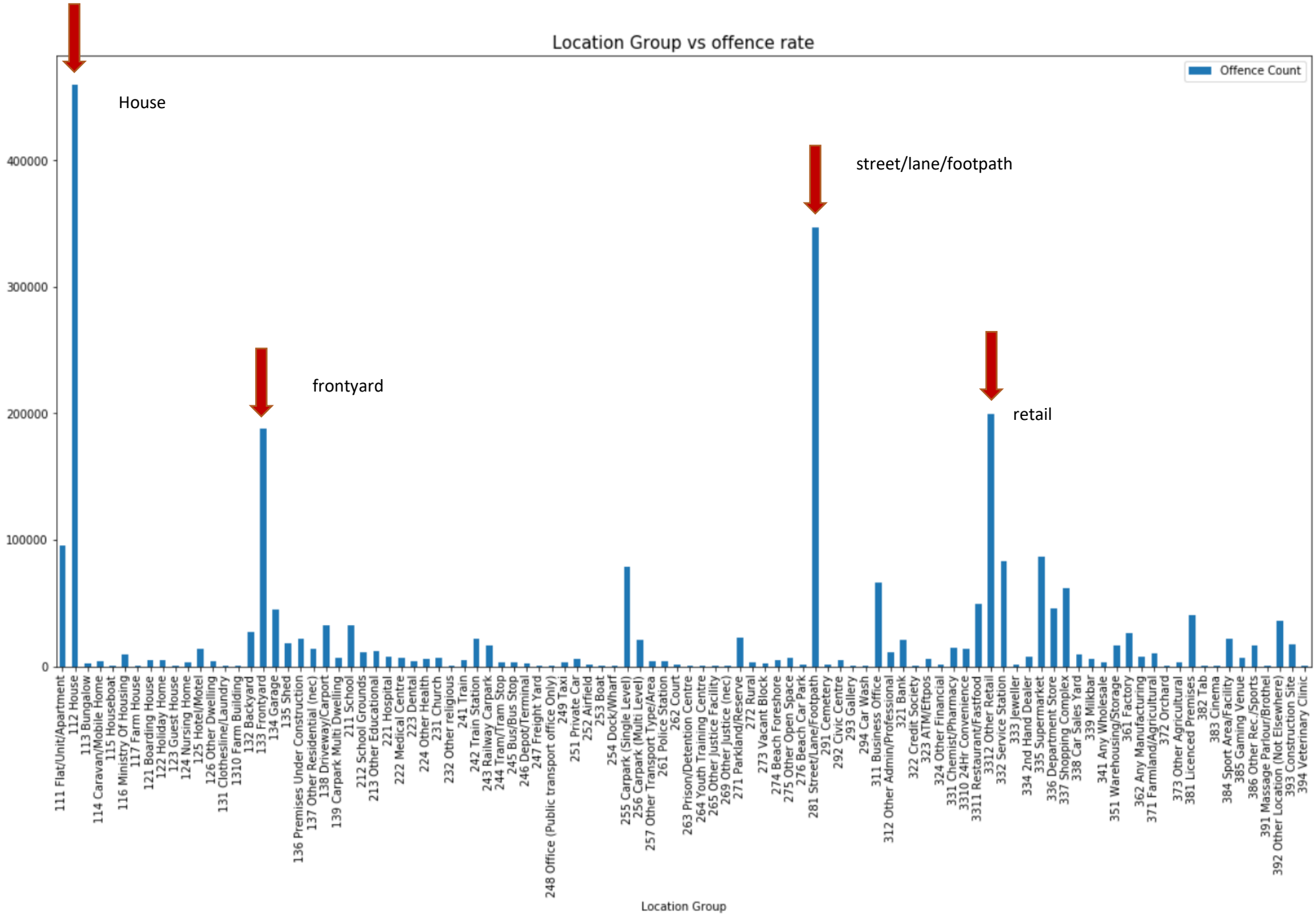


LGA ERP vs Property Offence Rate (2017)

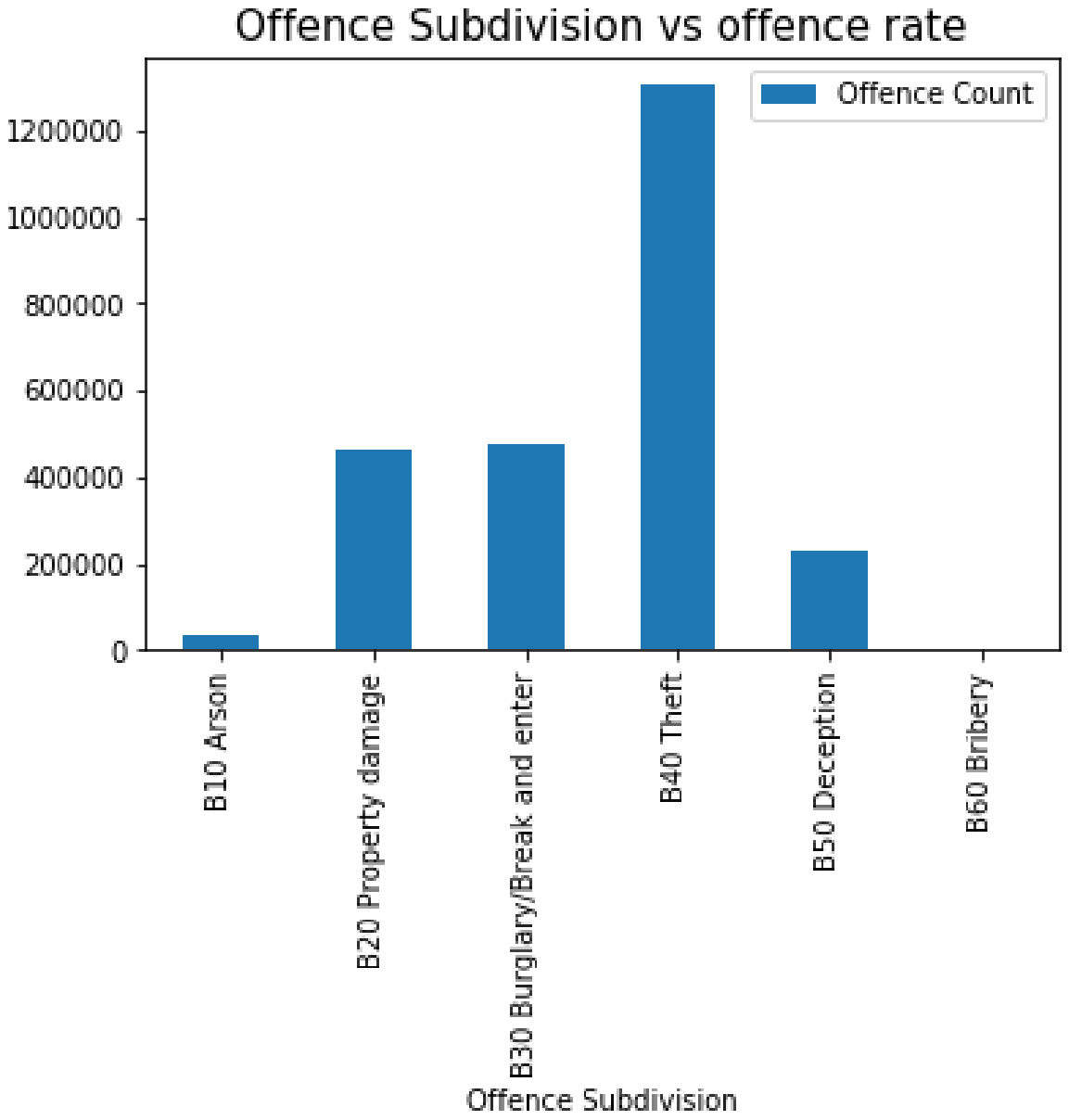


Mutual Information for Offence Counts

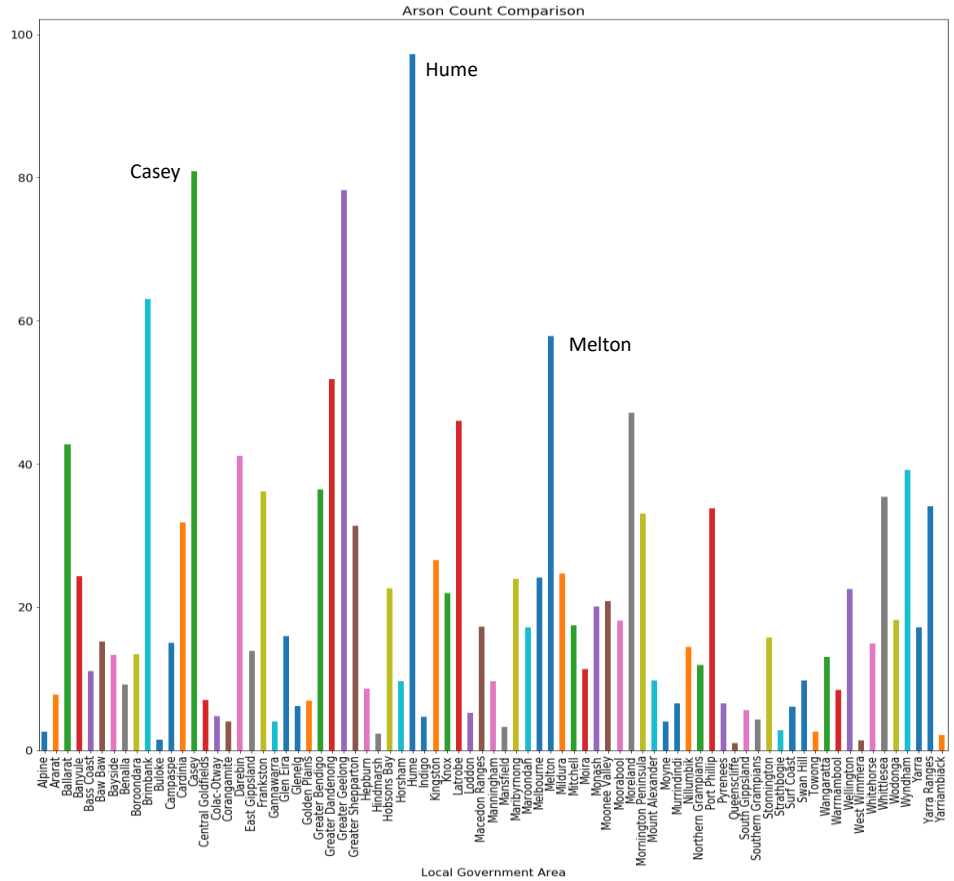


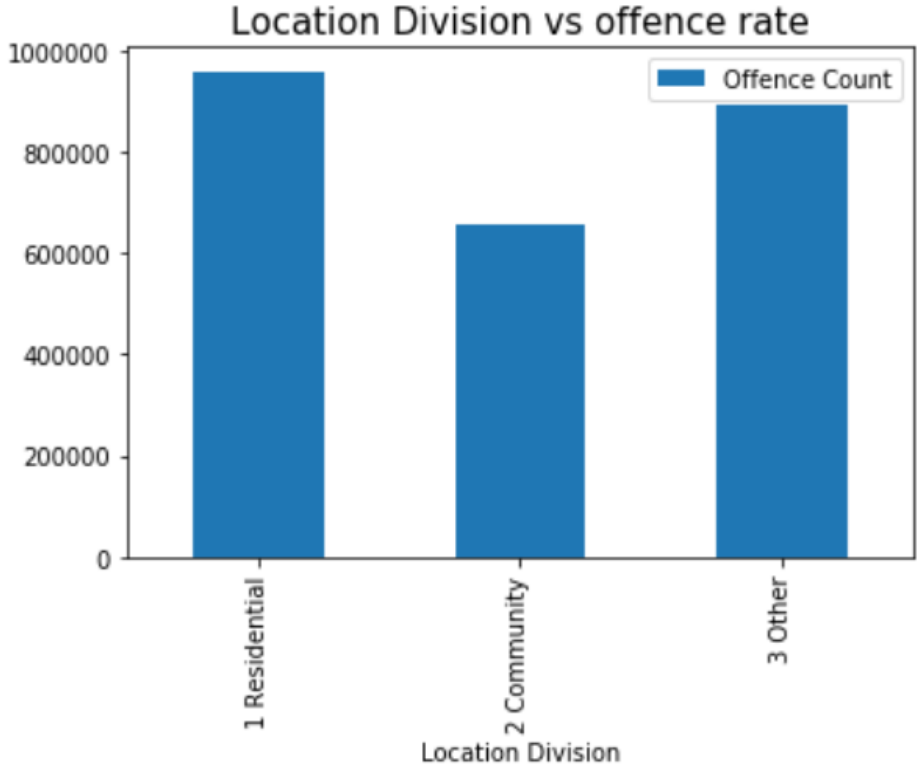

Location Group vs offence rate
Offence Count
House
frontyard
street/lane/footpath
retail
400000
300000
200000
100000
0
111 Flat/Unit/Apartment
112 House
113 Bungalow
114 Caravan/Mobile Home
115 Houseboat
116 Ministry Of Housing
117 Farm House
121 Boarding House
122 Holiday Home
123 Guest House
124 Nursing Home
125 Hotel/Motel
126 Other Dwelling
131 Clothesline/Laundry
1310 Farm Building
132 Backyard
133 Frontyard
134 Garage
135 Shed
136 Premises Under Construction
137 Other Residential (nec)
138 Driveway/Carport
139 Carpark Multi Dwelling
211 School
212 School Grounds
213 Other Educational
221 Hospital
222 Medical Centre
223 Dental
224 Other Health
231 Church
232 Other religious
241 Train
242 Train Station
243 Railway Carpark
244 Tram/Tram Stop
245 Bus/Bus Stop
246 Depot/Terminal
247 Freight Yard
248 Office (Public transport office Only)
249 Taxi
251 Private Car
252 Airfield
253 Boat
254 Dock/Wharf
255 Carpark (Single Level)
256 Carpark (Multi Level)
257 Other Transport Type/Area
261 Police Station
262 Court
263 Prison/Detention Centre
264 Youth Training Centre
265 Other Justice Facility
269 Other Justice (nec)
271 Parkland/Reserve
272 Rural
273 Vacant Block
274 Beach Foreshore
275 Other Open Space
276 Beach Car Park
281 Street/Lane/Footpath
291 Cemetery
292 Civic Centre
293 Gallery
294 Car Wash
311 Business Office
312 Other Admin/Professional
321 Bank
322 Credit Society
323 ATM/Eftpos
324 Other Financial
331 Chemist/Pharmacy
3310 24Hr Convenience
3311 Restaurant/Fastfood
3312 Other Retail
332 Service Station
333 Jeweller
334 2nd Hand Dealer
335 Supermarket
336 Department Store
337 Shopping Complex
338 Car Sales Yard
339 Milkbar
341 Any Wholesale
351 Warehousing/Storage
361 Factory
362 Any Manufacturing
371 Farmland/Agricultural
372 Orchard
373 Other Agricultural
381 Licenced Premises
382 Tab
383 Cinema
384 Sport Area/Facility
385 Gaming Venue
386 Other Rec./Sports
391 Massage Parlour/Brothel
392 Other Location (Not Elsewhere)
393 Construction Site
394 Veterinary Clinic
Location Group

Distribution of Property Offence Rates



Interesting Findings





Challenges

Hard to impute categorical information

Hard to determine the validity of certain regions

Outliers were an integral part of the data

Summary

1

Property offences are the most common type of crime

2

The population of an area has very little to do with the crime rate

3

Crime rate has a high correlation with the location type

4

Theft is the most common type of property offence and arson is the lowest, fire station construction should prioritise locations with a high arson rate