Crime, Population And Some resources in South Africa

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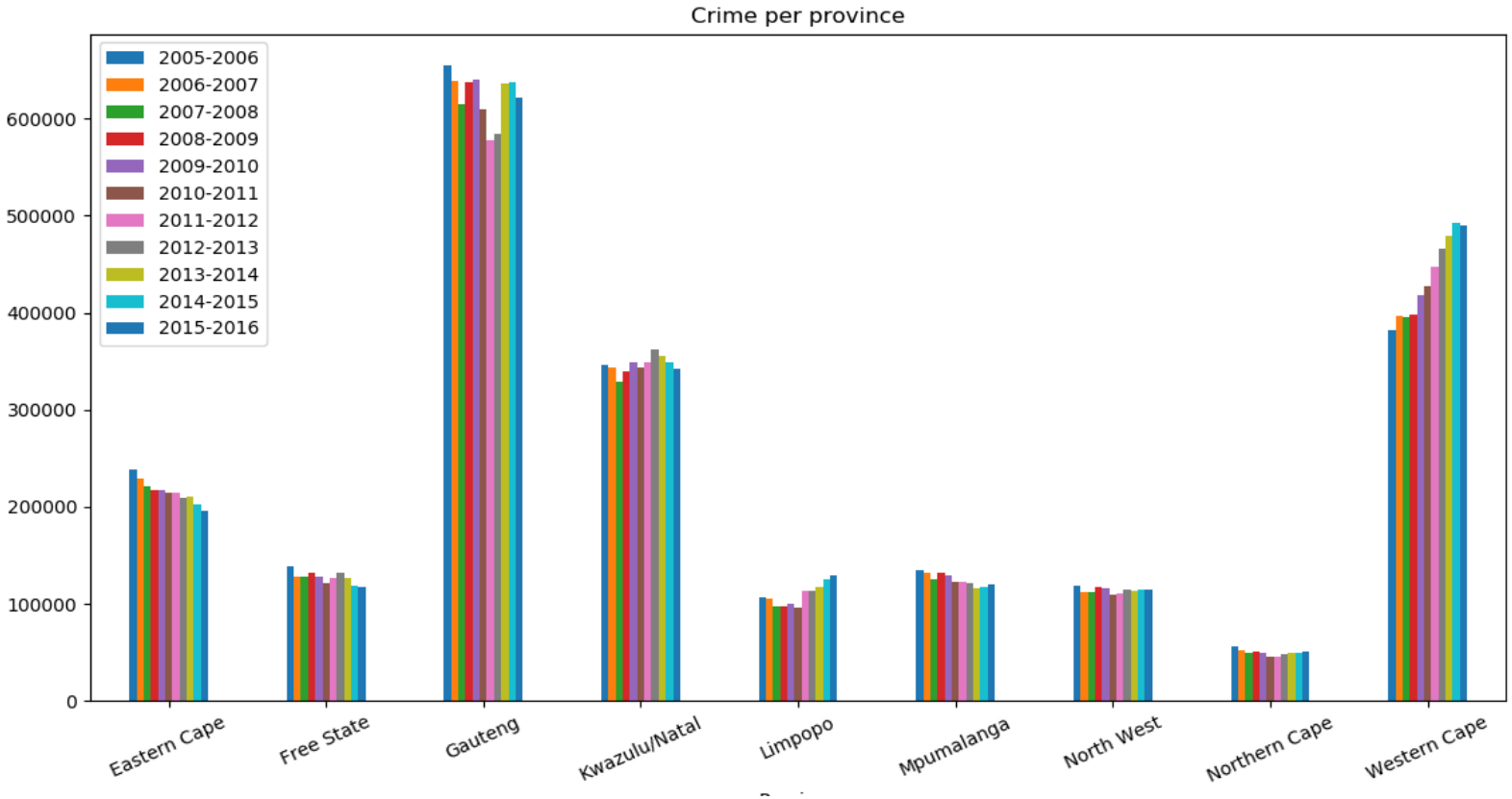
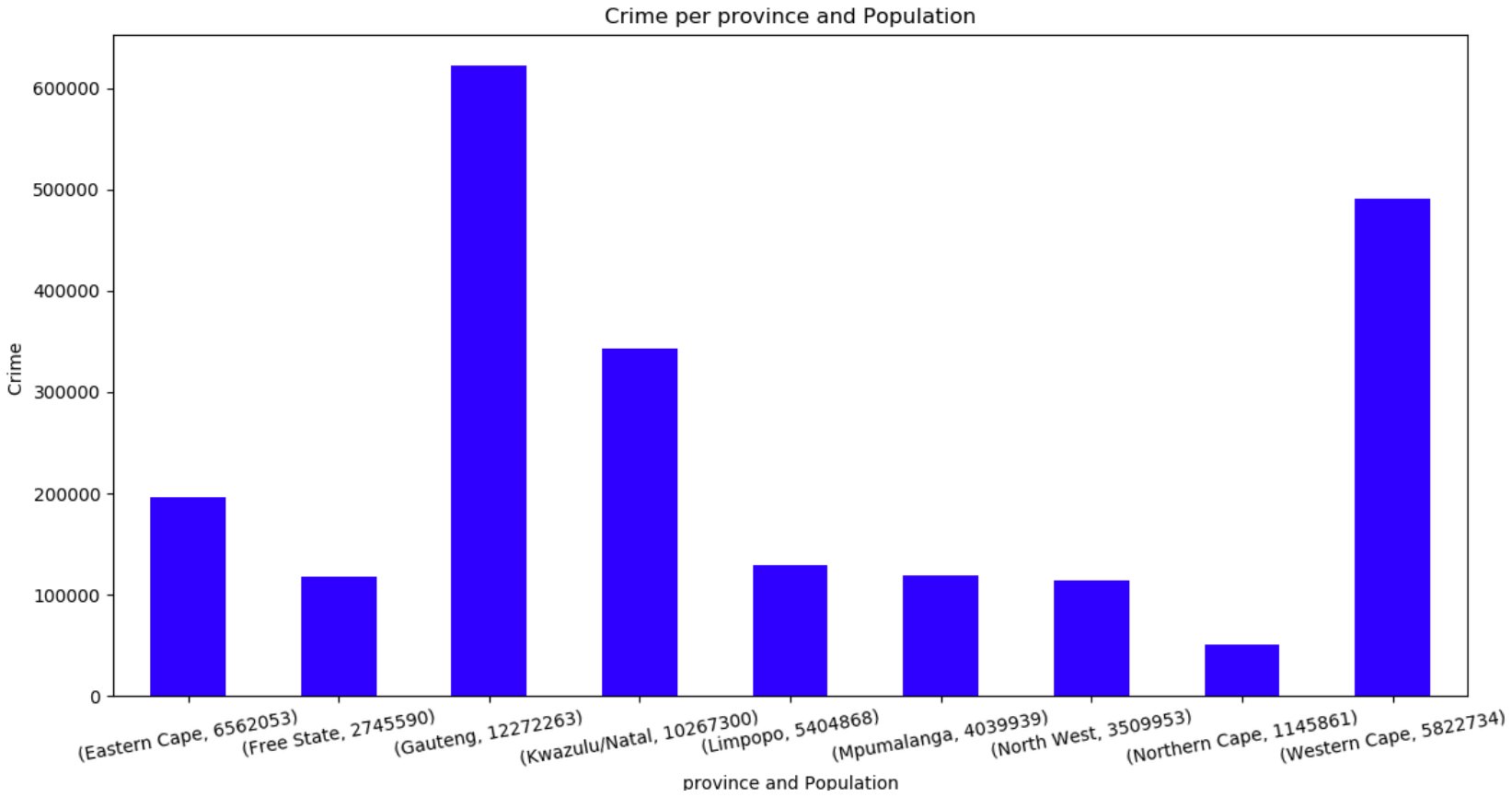
1 Motivation

South Africa may be the most dangerous countries in the world,The crime rate per year and each province ranges from 238357.97979797982 Crime



The most dangerous province is Gauteng , the less dangerous is Northern Cape .Why That?, We Can't Know with single Data set so , We Get Population and Area Data Set,"That is very useful to get senece for our data".



It's Amazing we show that the Population may be effect in Crimes.

2 About Data

2.1 The mainly Data

Is A Crime in South Africa [Wes16],And that is containt of Some Attributes.

Province	Station	Category	Years From 2005 to 2016

2.2 The minor Data

1. **Firstly**,Is the Population for each province [Sei16]

Province	Population	Area	Density

2. **Secondly**,Is the Price of Resources and economic for South Africa [nei18]

Resources	Attribute 1	Attribute 2

3 The message

We imposed two hypotheses [1]

3.1 hypotheses

Human mind like making hypotheses because of what is happening around him/her, is this a right thing?. In my opinion data confirms to us that hypotheses are True or False

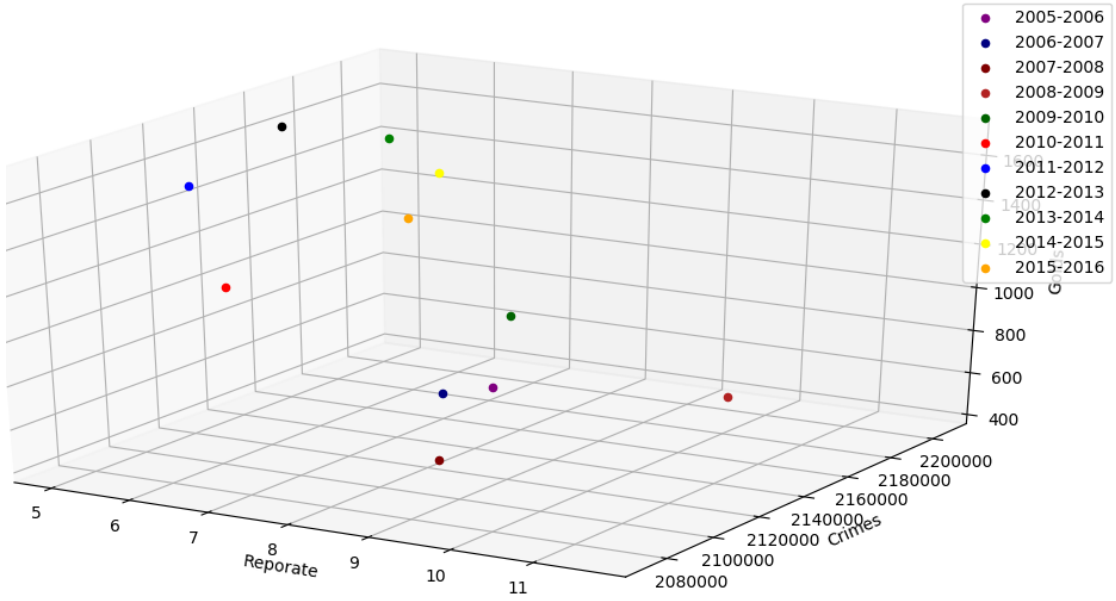
3.2 Hypothesis one

Hypothesis one:*"There is correlation between Crimes,Economic and Price of resources "*

3.2.1 why Hypothesis one?

We are sure that economics and resources's prices have a connection with committing crimes, with plotting data, we found that when a recession happens in economy (Repo-Rate) and overgrowth happens in Resources prices(gold's) those things lead to crimes be committed.
These things make us predict in the future when a recession happens in economy and overgrowth happens in resources prices , an overgrowth in number of committing

crimes


2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014-2015
2015-2016
1000
800
600
400
2200000
2180000
2160000
2140000
2120000
2100000
2080000
Crimes
5
6
7
8
9
10
11
Reporate

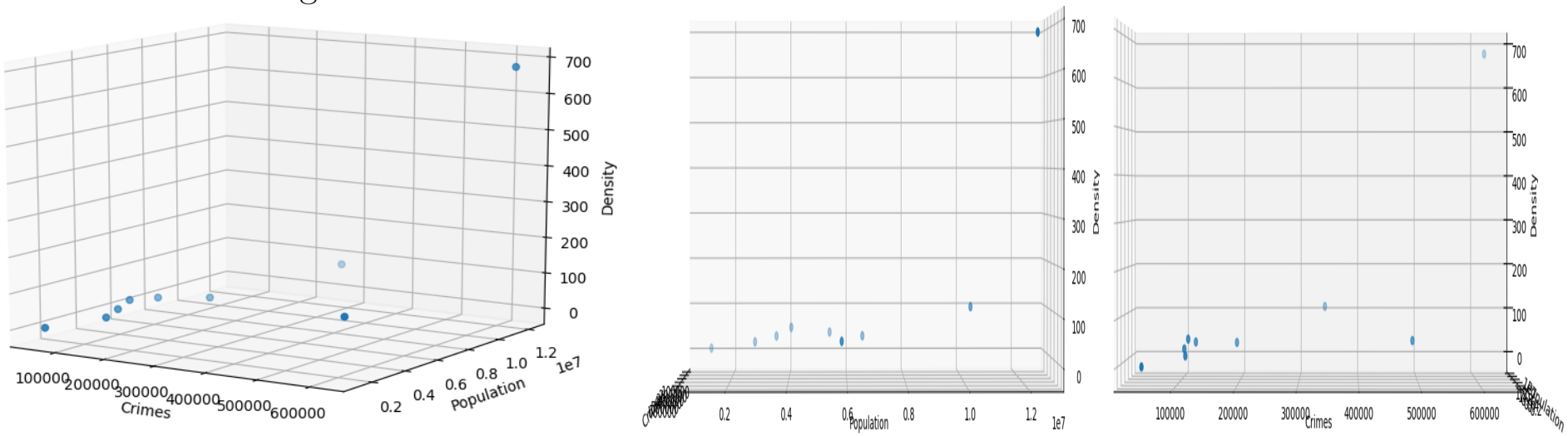
3.3 Hypotheses two

Hypothesis two: *"there is correlation between Crimes,Population and Density "*

3.3.1 Why Hypothesis two?

We are sure that population and density by any means affect on crimes, and by Plotting Data we found that when population and density increase crimes increase.

These conclusions make us predict when any overgrowth in population and density occurs number of crimes increases probably ,but actually this is not the only reason for committing crimes the are lots of other factors that affect



4 Analysis

4.1 Features

Let's start o with each feature's mean variance

year	Mean	variance
2005-2006	$\mu = 70.527753$	σ^2=42226.837961
2006-2007	$\mu = 69.301610$	σ^2=39218.904945
2007-2008	$\mu = 67.154305$	σ^2=34879.488244
2008-2009	$\mu = 68.756165$	σ^2=35034.053796
2009-2010	$\mu = 69.517773$	σ^2=34415.680865
2010-2011	$\mu = 67.766696$	σ^2=33075.197479
2011-2012	$\mu = 68.259616$	σ^2=33611.527218
2012-2013	$\mu = 69.700658$	σ^2=34155.630612
2013-2014	$\mu = 71.416999$	σ^2=35206.970857
2014-2015	$\mu = 71.498202$	σ^2=34232.047218
2015-2016	$\mu = 70.736496$	σ^2=32171.431535

4.1.1 Sample Mean & Sample Variance

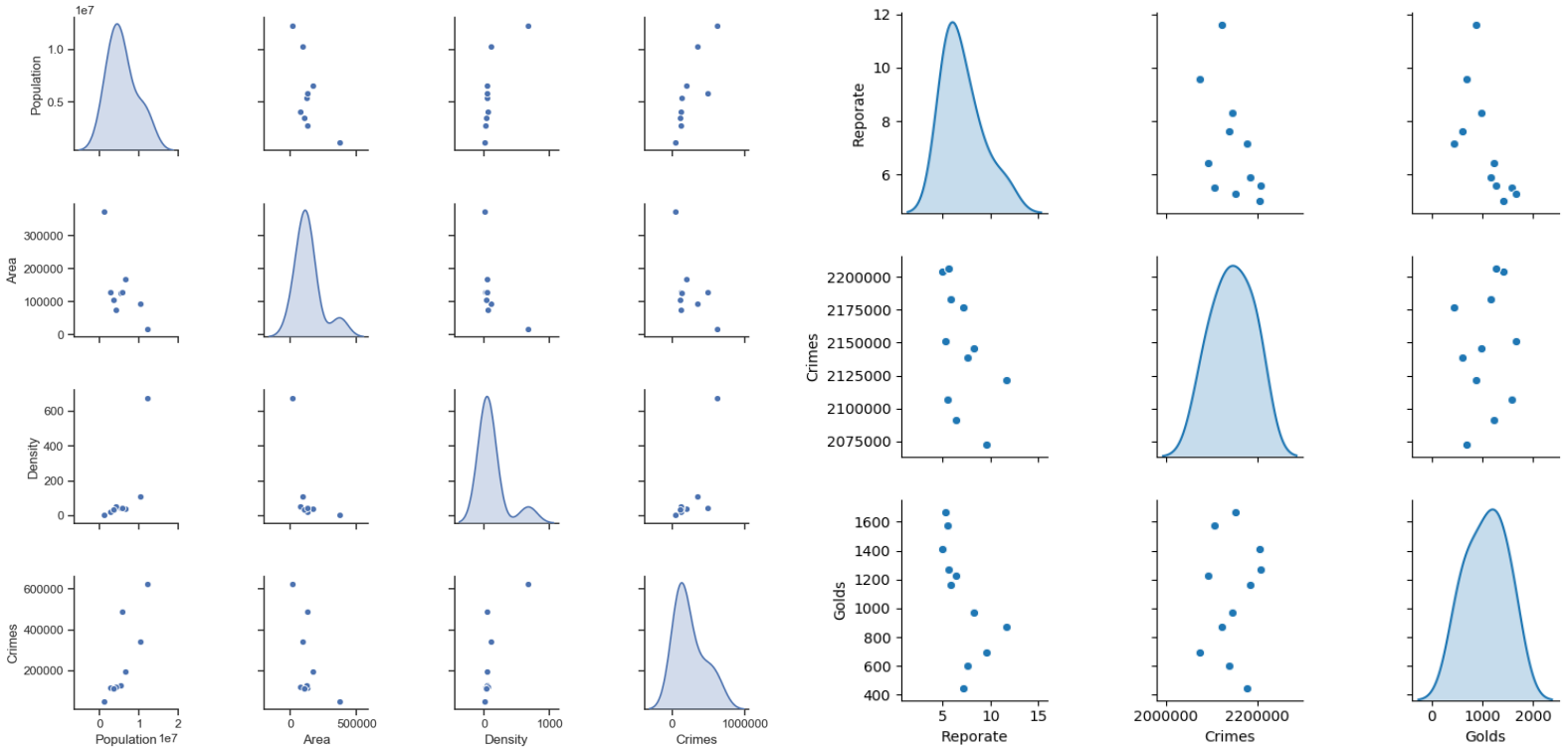
Taking 50 samples each of size of 100 observations and calculate each sample mean variance and taking their overall mean variance will produce the result

year	Mean	variance
2005-2006	$\mu = 71.82560$	σ^2=2.864590e+08
2006-2007	$\mu = 70.36100$	σ^2=2.936046e+08
2007-2008	$\mu = 68.48832$	σ^2=3.204807e+08
2008-2009	$\mu = 70.19544$	σ^2=4.254554e+08
2009-2010	$\mu = 70.65660$	σ^2=4.602510e+08
2010-2011	$\mu = 69.03816$	σ^2=4.068959e+08
2011-2012	$\mu = 69.44044$	σ^2=4.323721e+08
2012-2013	$\mu = 70.85772$	σ^2=4.283663e+08
2013-2014	$\mu = 72.52240$	σ^2=3.910432e+08
2014-2015	$\mu = 72.65100$	σ^2=2.763614e+08
2015-2016	$\mu = 71.47740$	σ^2=2.427561e+08

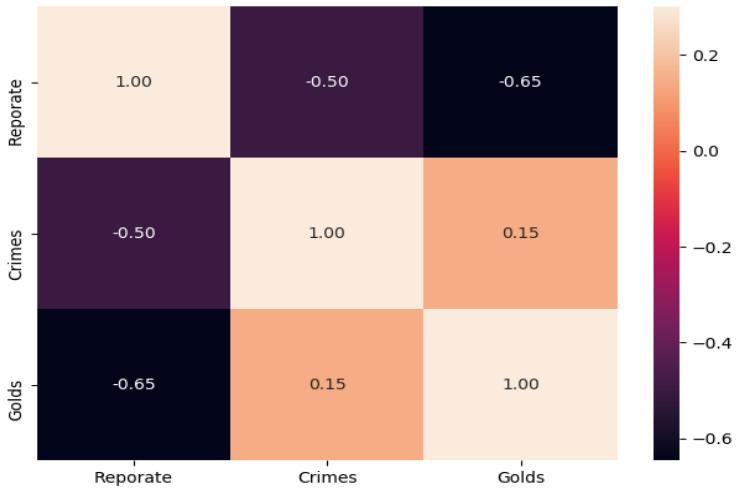
4.1.2 Covariance & Correlation

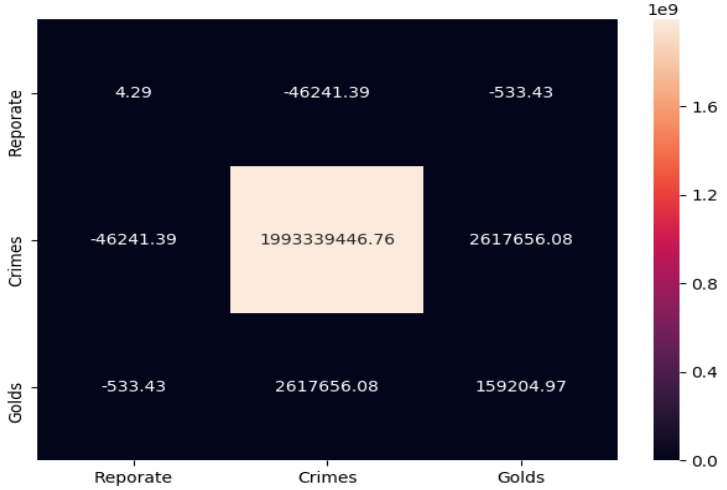
We will find the linear trend between all features ,using heap map and pair plot to scatter each pair features.

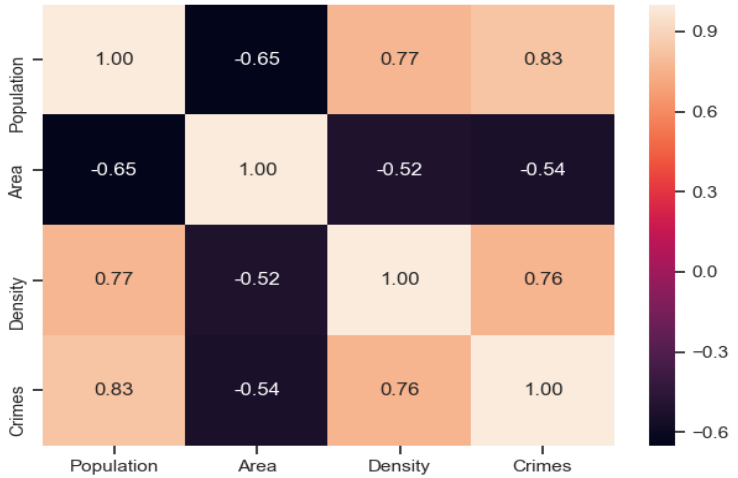
Figure 1: PairPlot

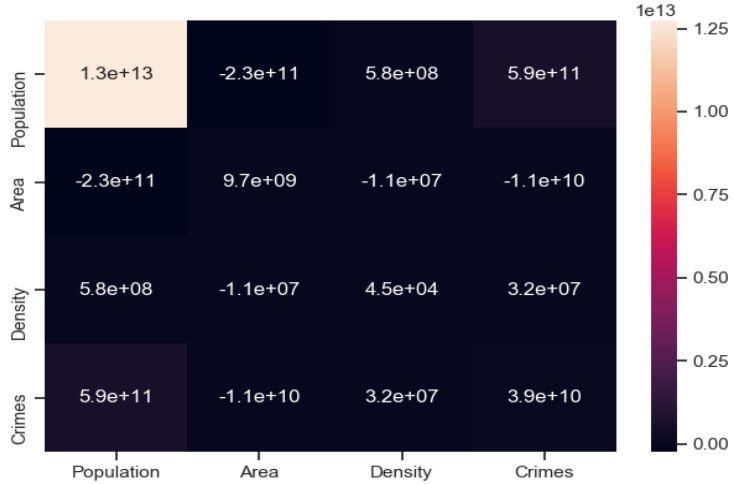


The First Figure show to us the linear trend between Population , Area , Density and Crimes. The Second Figure show to us the linear trend between Reporate , Golds and Crimes . From This Plotting , We are sure of what we said earlier.


Reporate
Crimes
Golds
1.00
-0.50
-0.65
-0.50
1.00
0.15
-0.65
0.15
1.00
0.2
0.0
−0.2
−0.4
−0.6

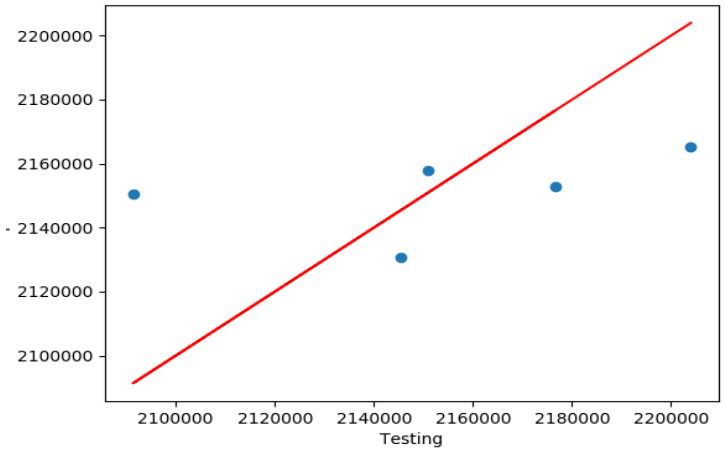

1e9
Reporate
Crimes
Golds
4.29
-46241.39
-533.43
-46241.39
1993339446.76
2617656.08
-533.43
2617656.08
159204.97
1.6
1.2
0.8
0.4
0.0

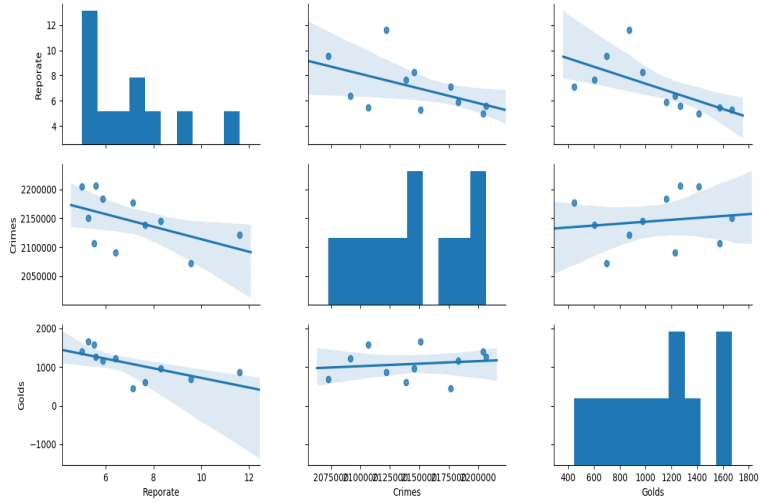

Population
Area
Density
Crimes
1.00
-0.65
0.77
0.83
-0.65
1.00
-0.52
-0.54
0.77
-0.52
1.00
0.76
0.83
-0.54
0.76
1.00
0.9
0.6
0.3
0.0
−0.3
−0.6


1e13
Population
Area
Density
Crimes
1.3e+13
-2.3e+11
5.8e+08
5.9e+11
-2.3e+11
9.7e+09
-1.1e+07
-1.1e+10
5.8e+08
-1.1e+07
4.5e+04
3.2e+07
5.9e+11
-1.1e+10
3.2e+07
3.9e+10
1.25
1.00
0.75
0.50
0.25
0.00

5 Predication

From Our hypotheses [1] ,We found it possible to predict .
After building our model to make a predication (linear regression), We made sure for our hypotheses.





When we make Repo-rate 5 & Gold's Price 1000 we Found Crimes will be 2179877.13100053
From Second Test ,When we make Repo-rate 11 & Gold's Price 1000 we Found Crimes will be 2093212.43963853.

6 Conclusion

we Prove our hypotheses, we Can tell that the our hypotheses is true but in sometime ,There are a lot of factors that can change hypotheses

References

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