DOES POVERTY BREED NECESSITY?

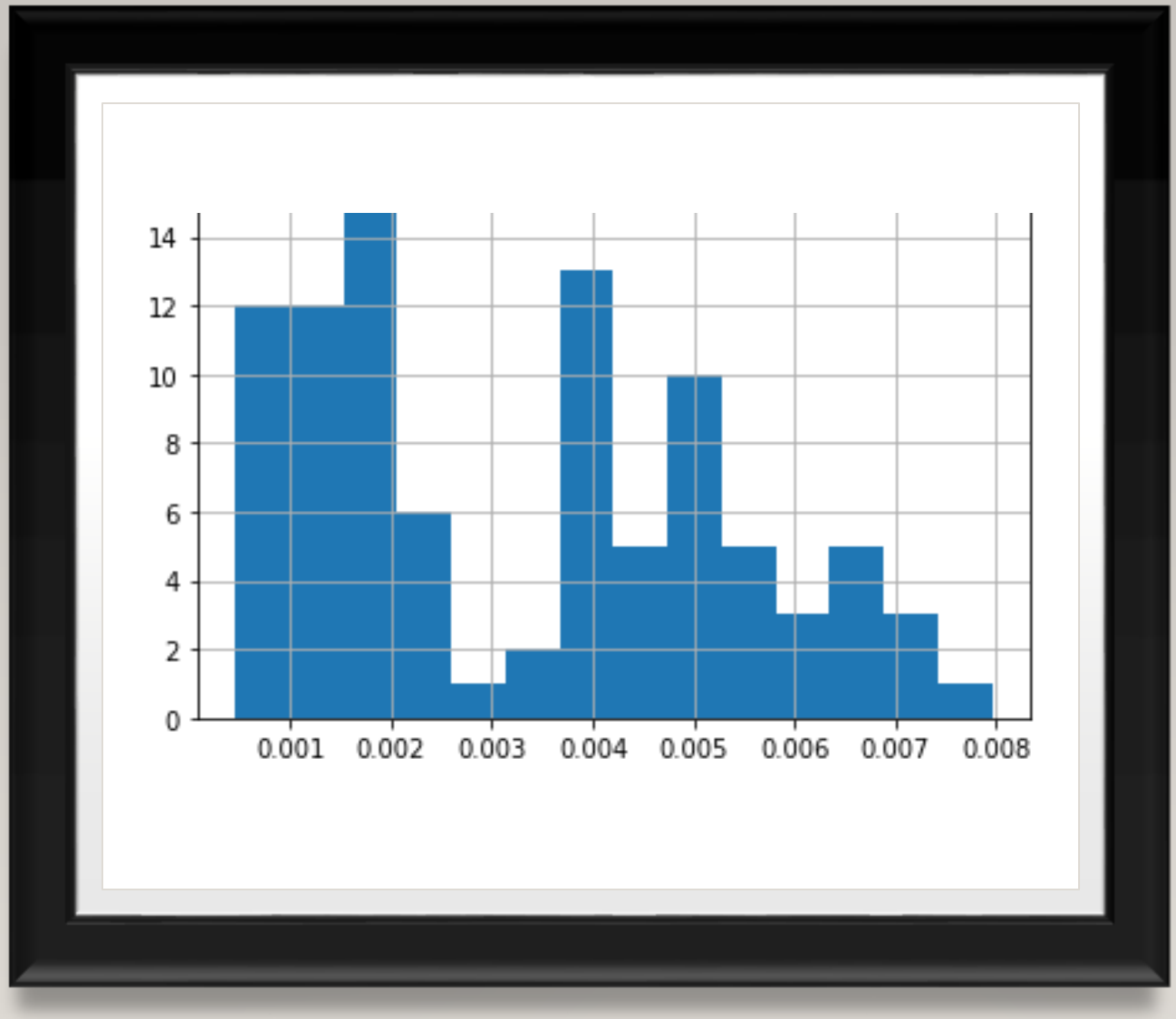
BELLEVUE UNIVERSITY DSC530 MATTHEW SCANLAN

VARIABLES USED

- ratio_below_poverty_line: Count of individuals under the poverty line divided by the total observations
- Violent_crime_per_capita:Violent Crime incidents in a year in a city divided by the cities' population
- Robbery_per_capita: Roberies in a year in a city divided by the cities' population
- Aggravated_assault_per_capita Assaults in a year in a city divided by the cities' population
- Property_crime_per_capita: Property Crime in a year in a city divided by the cities' population
- Burglary_per_capita: Burgalries in a year in a city divided by the cities' population
- Larceny_theft_per_capita Larceny incidents in a year in a city divided by the cities' population
- Motor_vehicle_theft_per_capita: Motor vehicle theft in a year in a city divided by the cities' population

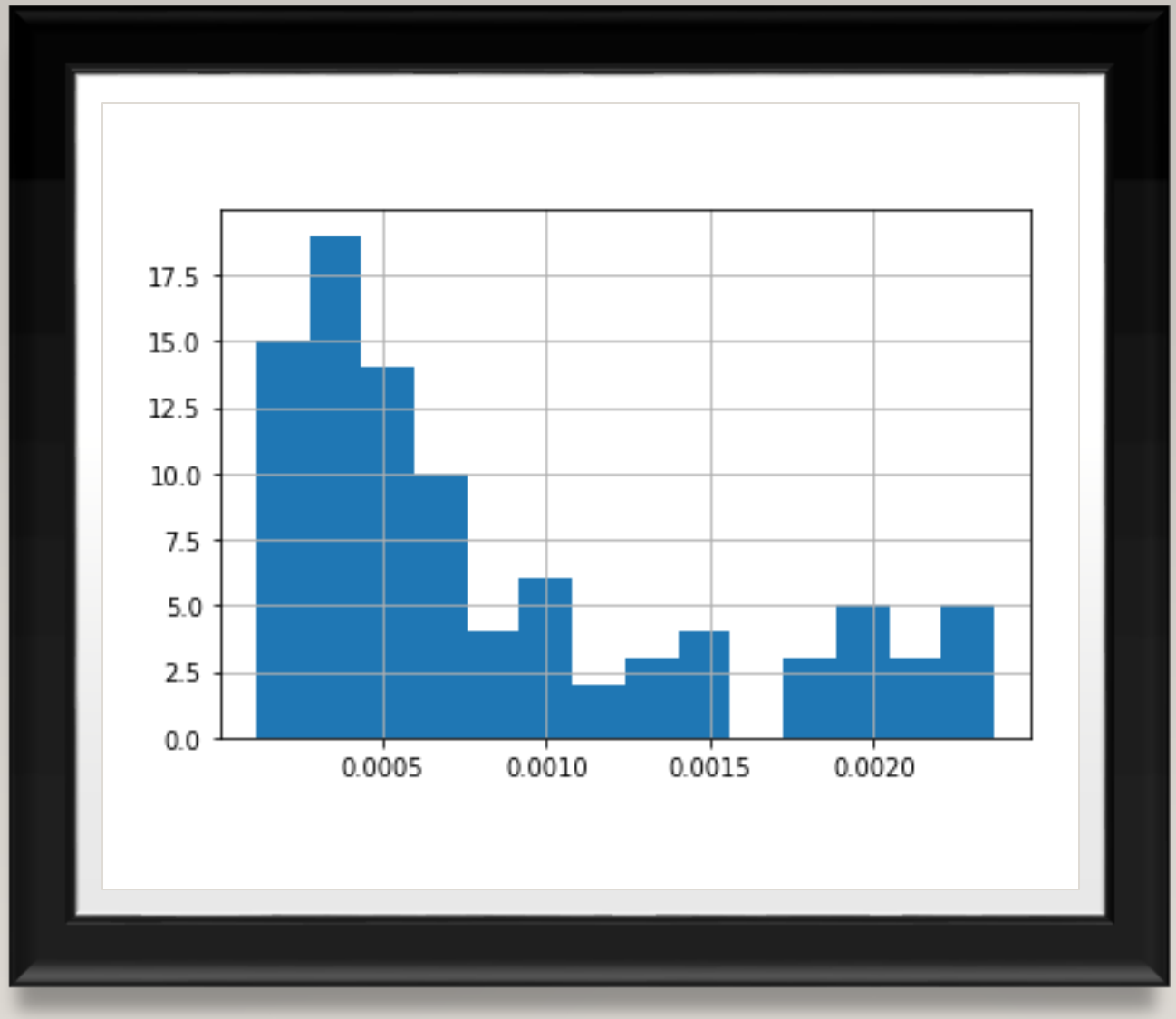
VIOLENT CRIME PER CAPITA

- The Mean of Violent crime per capita is 0.003299778374618655 7
- The mode of Violent crime per capita is not valid, no vals are equal
- The spread/std div of Violent crime per capita is 0.0020351482940844 41
- The kurtosis of Violent crime per capita is -1.0589929022273714



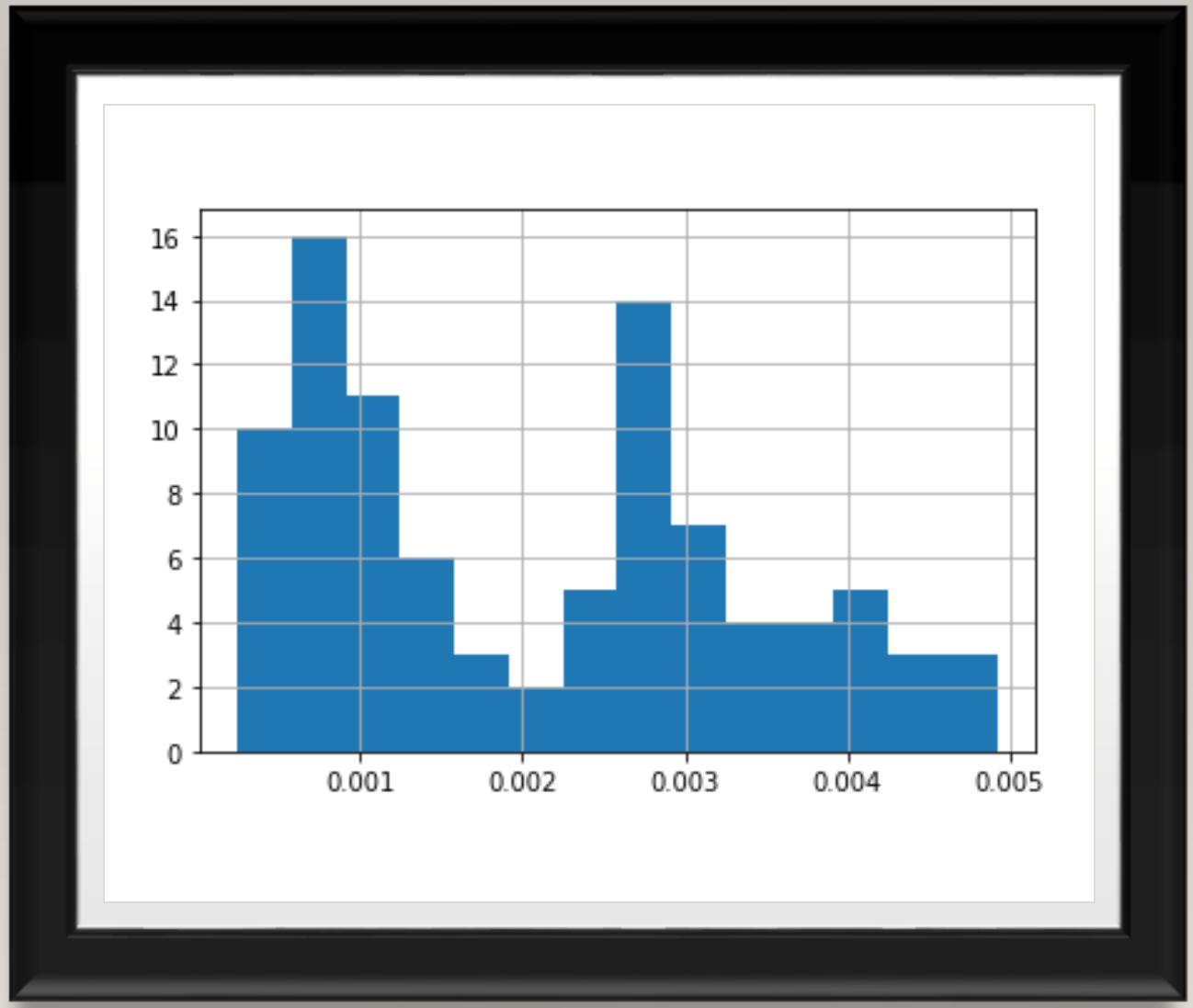
ROBBERY PER CAPITA

- The Mean of Robbery per capita is 0.0008396605758882034
- The mode of Robbery per capita is not valid, no vals are equal
- The spread/std div of Robbery per capita is 0.0006638256786521 49
- The kurtosis of Robbery per capita is -0.21779805800931 13



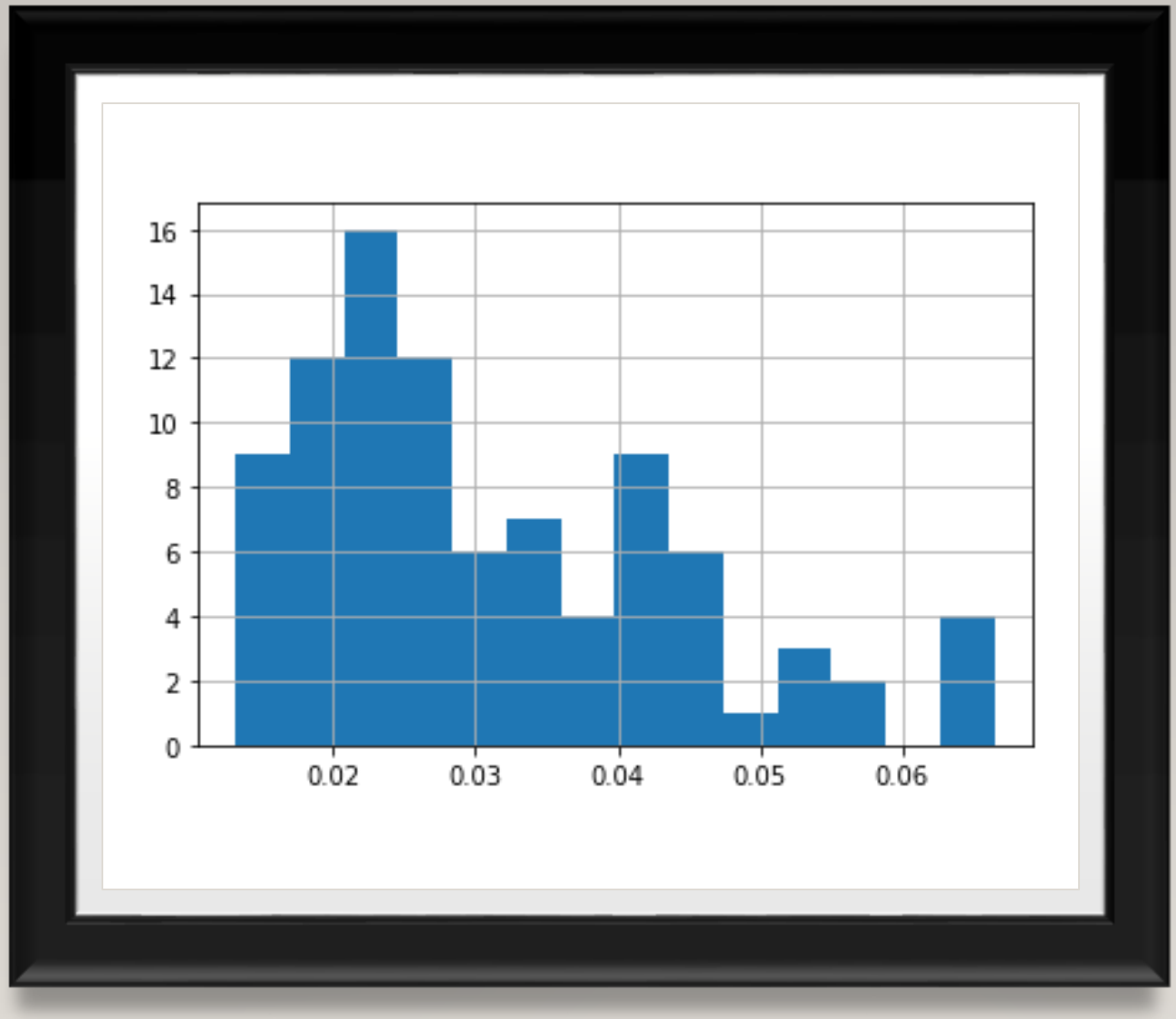
AGGRAVATED ASSAULT PER CAPITA

- The Mean of Aggravated assault per capita is 0.002085927506814355 2
- The mode of Aggravated assault per capita is not valid, no vals are equal
- The spread/std div of Aggravated assault per capita is 0.0013186198641493786
- The kurtosis of Aggravated assault per capita is -1.1354446421023296



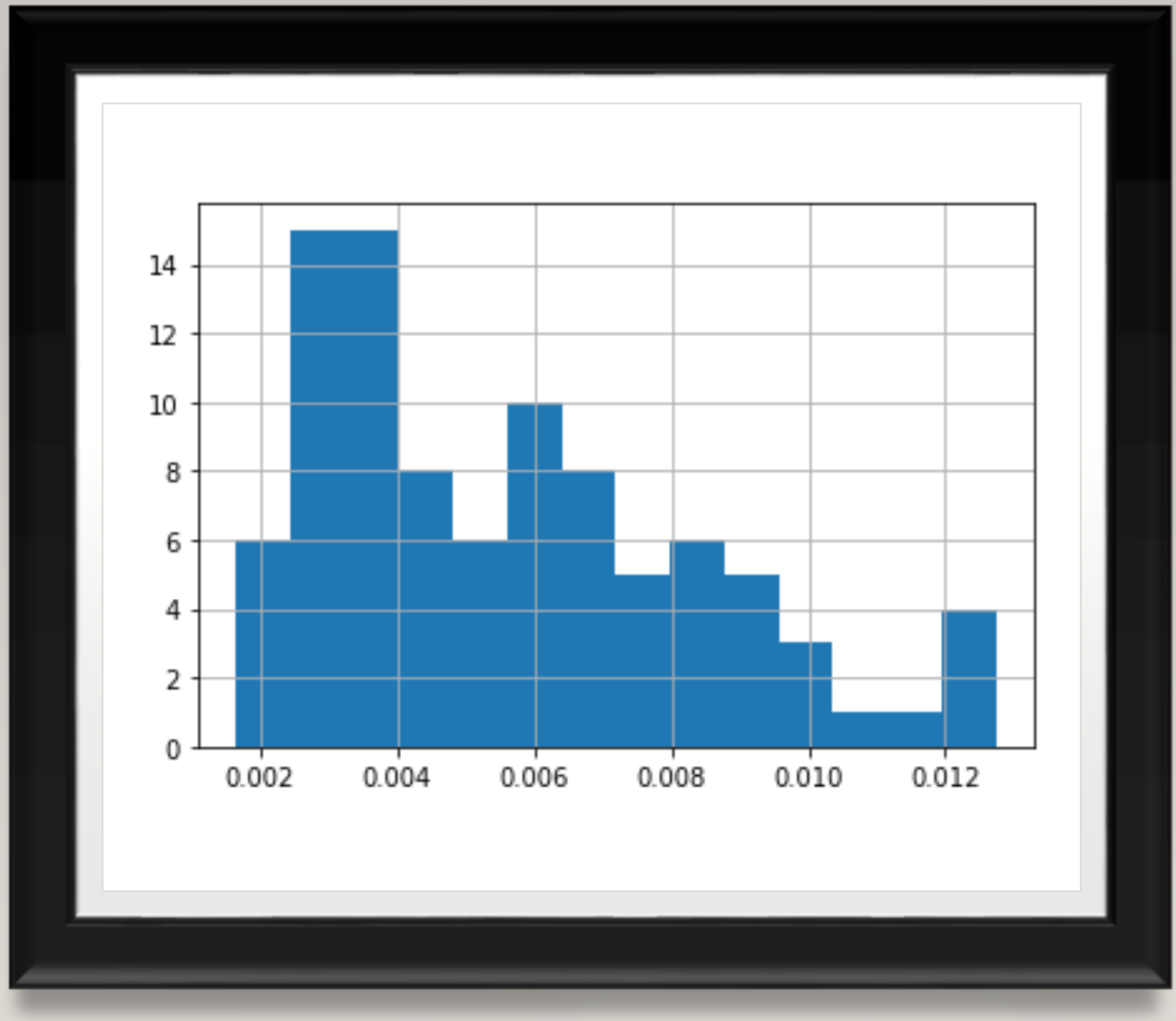
PROPERTY CRIME PER CAPITA

- The Mean of Property crime per capita is 0.031372078598670 97
- The mode of Property crime per capita is not valid, no vals are equal
- The spread/std div of Property crime per capita is 0.013411610965632906
- The kurtosis of Property crime per capita is 0.07047163378549515



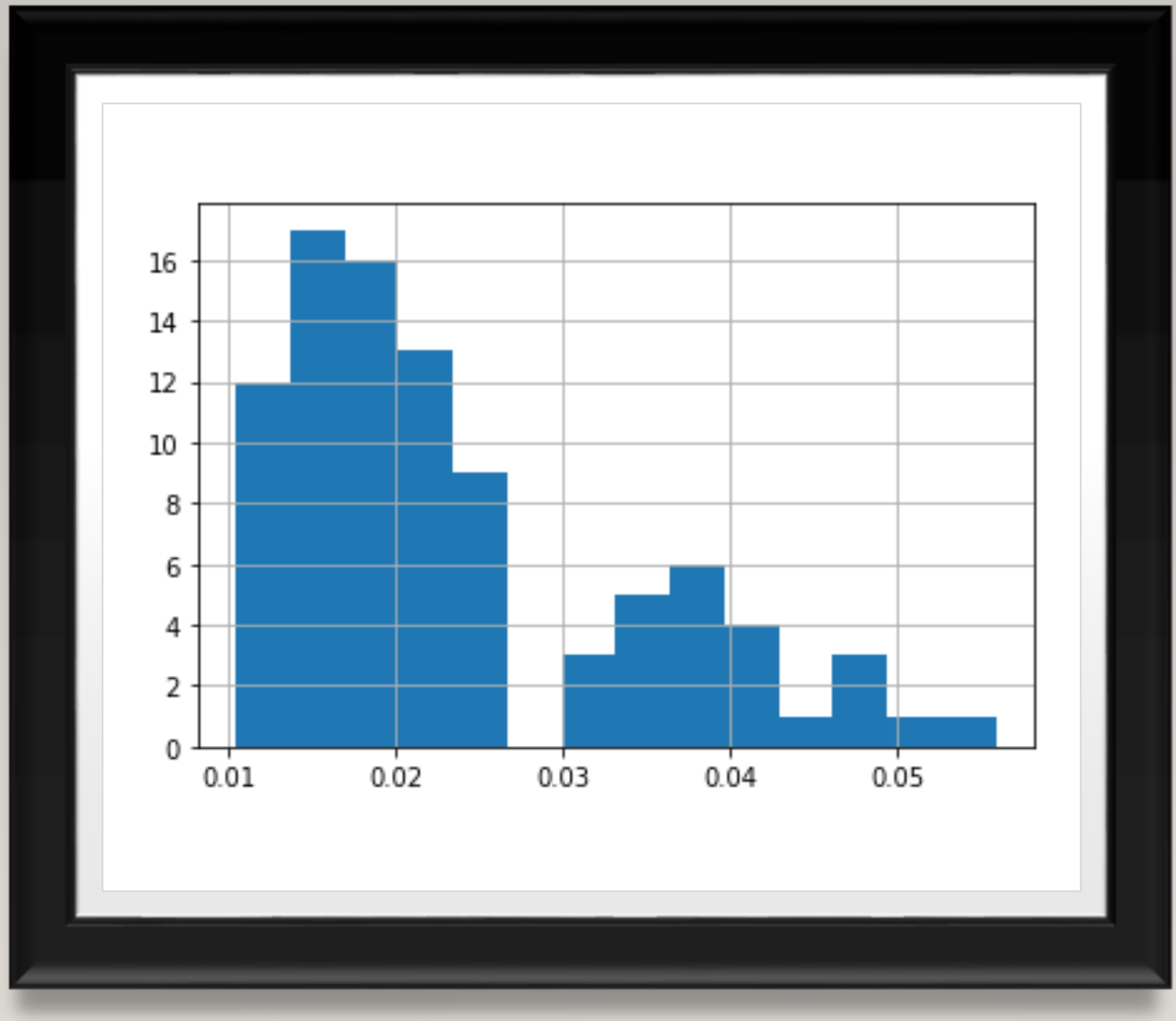
BURGLARY PER CAPITA

- The Mean of Burglary per capita is 0.005642594110452932 The mode of Burglary per capita is not valid, no vals are equal The spread/std div of Burglary per capita is 0.002786545109057191 7 The kurtosis of Burglary per capita is -0.3222743642866903



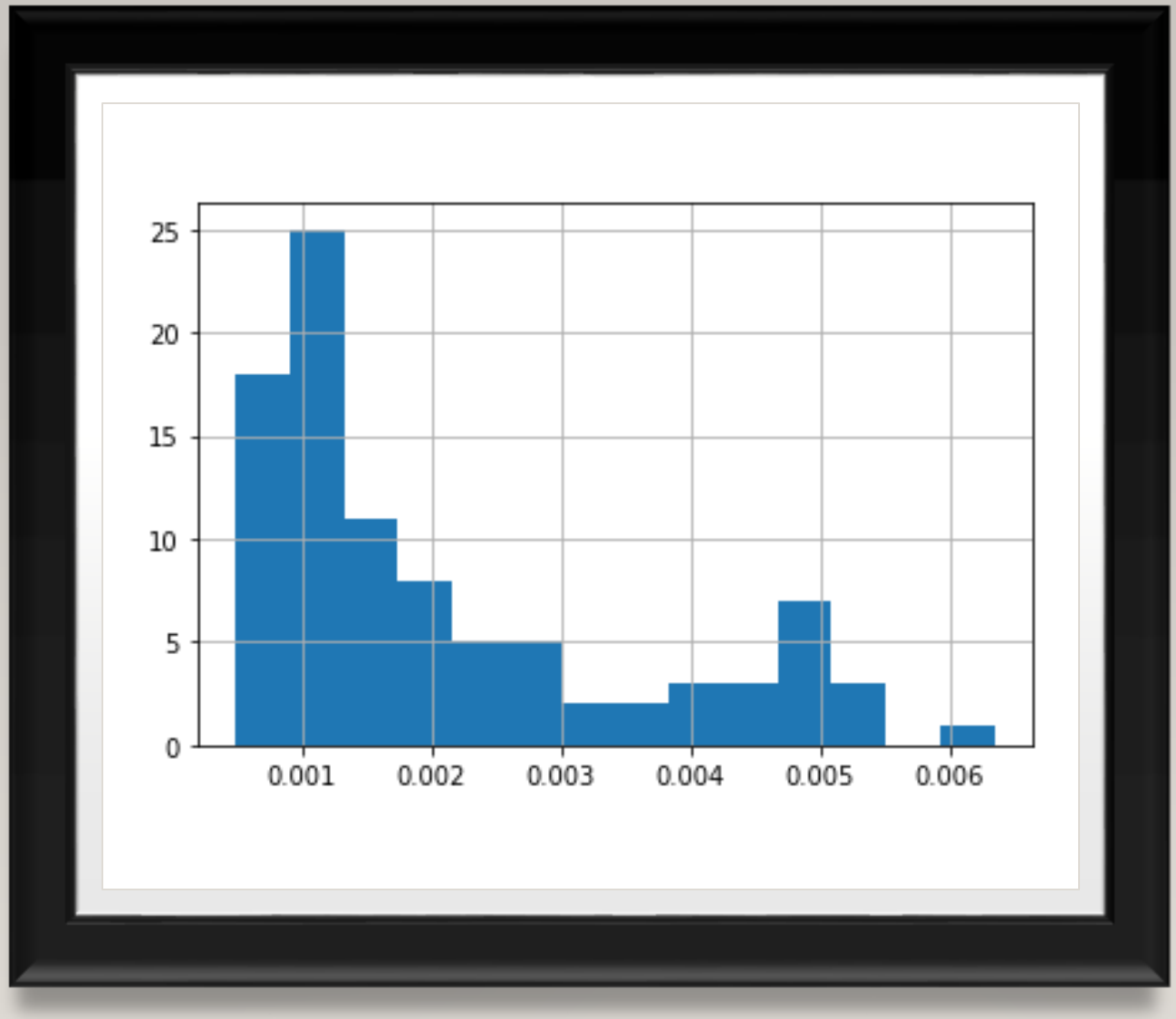
LARCENY THEFT PER CAPITA

- The Mean of Larceny-theft per capita is 0.02377322445937696 3
The mode of Larceny-theft per capita is not valid, no vals are equal
The spread/std div of Larceny-theft per capita is 0.010801702667358214 The kurtosis of Larceny-theft per capita is 0.19596514643480845



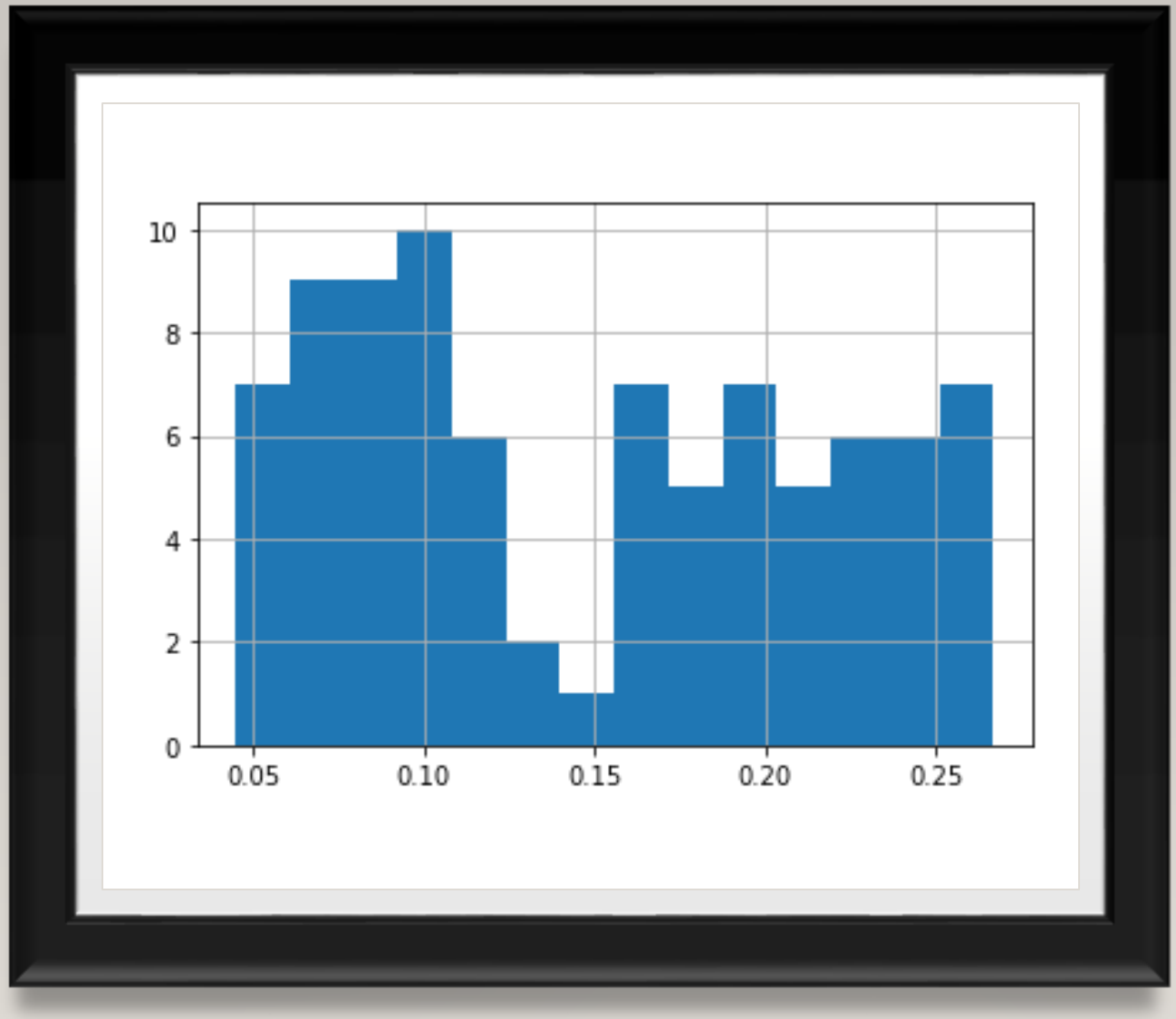
MOTOR VEHICLE THEFT PER CAPITA

- The Mean of Motor vehicle theft per capita is 0.0021024442095274516 The mode of Motor vehicle theft per capita is not valid, no vals are equal The spread/std div of Motor vehicle theft per capita is 0.0014771013818055416 The kurtosis of Motor vehicle theft per capita is -0.09030612969464835



RATIO BELOW POVERTY LINE

- The Mean of ratio below poverty line is 0.14952996633480542 The mode of ratio below poverty line is not valid, no vals are equal The spread/std div of ratio below poverty line is 0.06857319360677647 The kurtosis of ratio below poverty line is -1.419974619512024

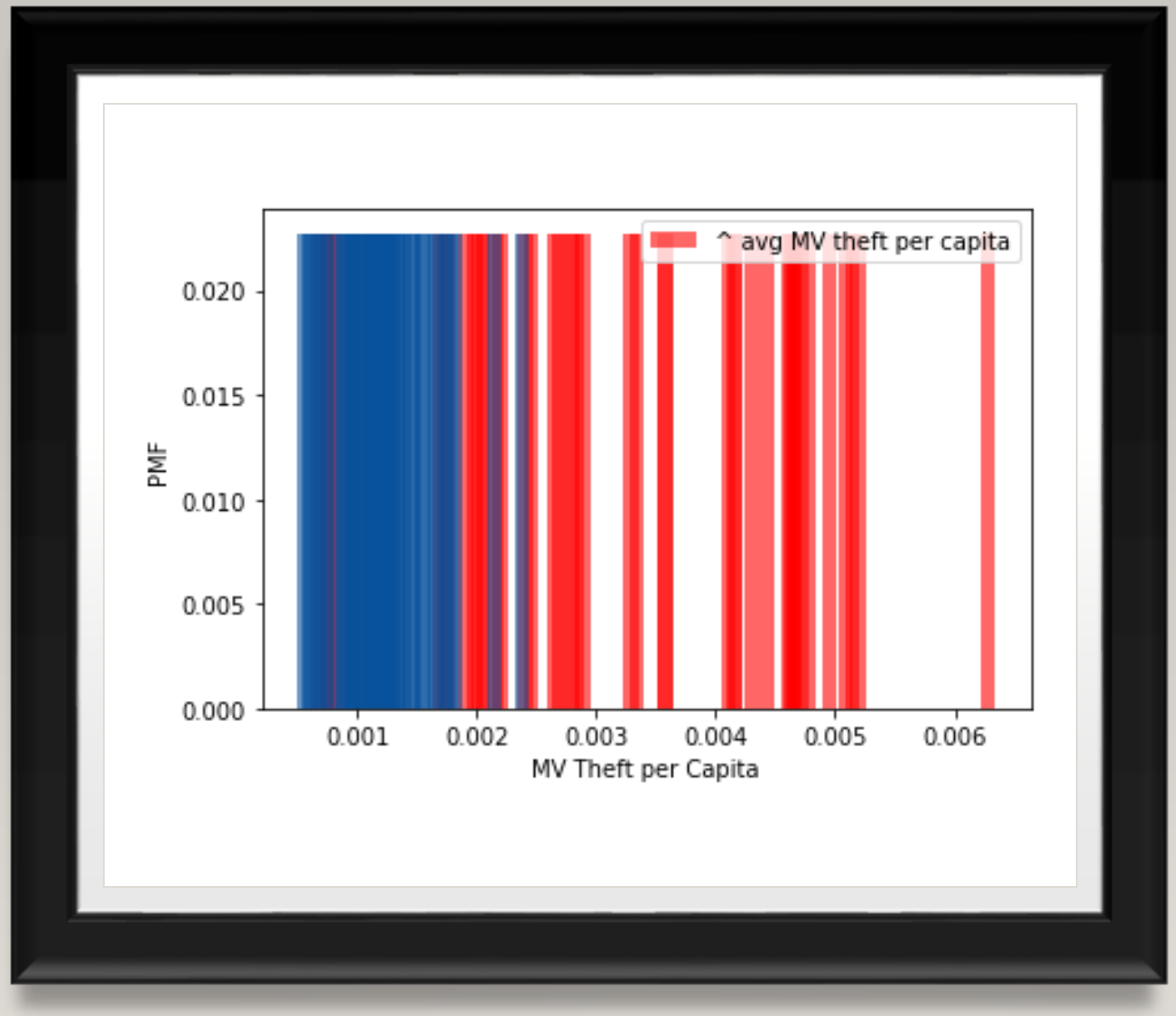


OUTLIERS

- There are a few outliers if a box and whisker graph is generated.
- However this data cannot be determined as invalid.
- The outliers provide additional information that helps to inform the analysis

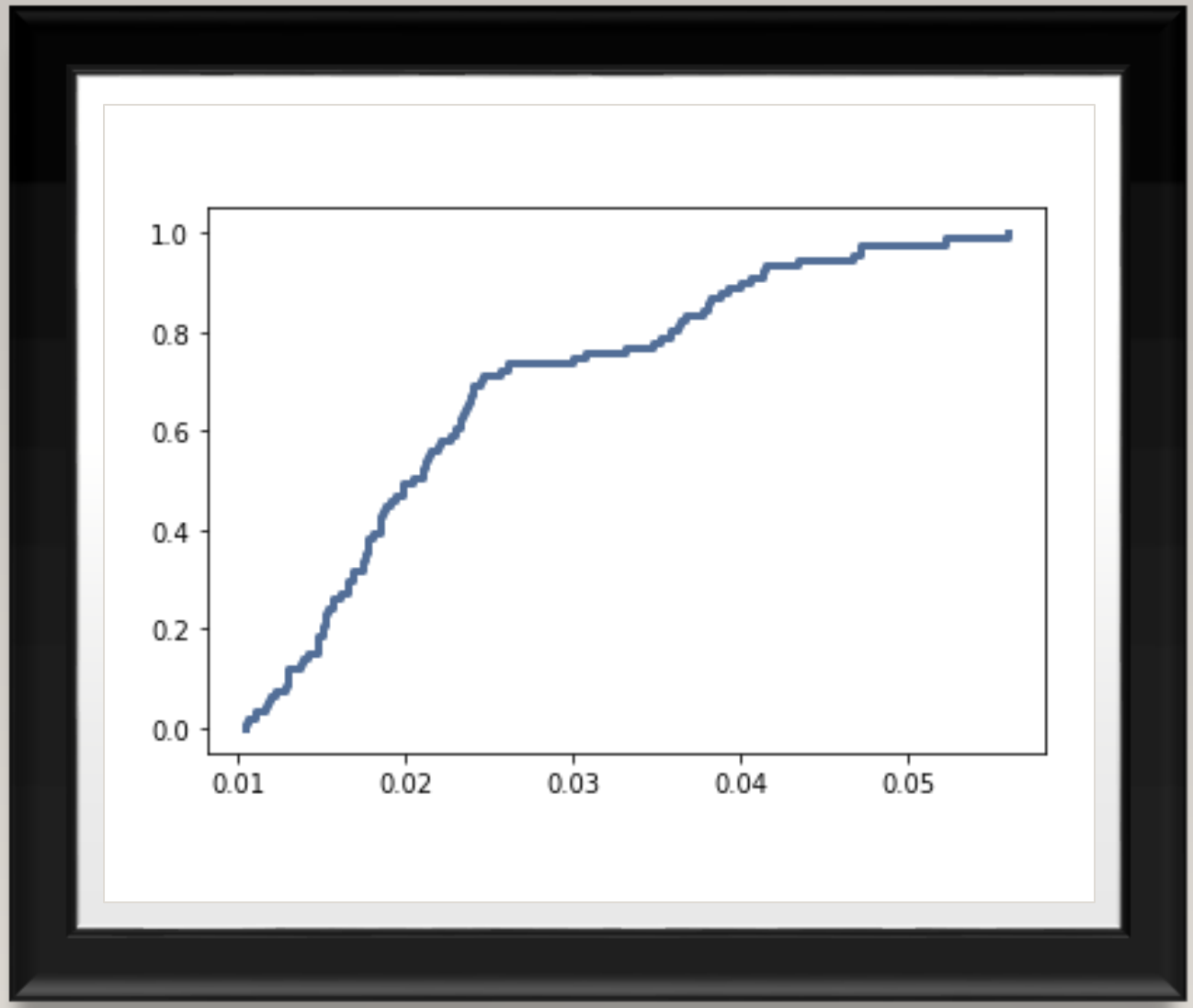
PMF OF MOTOR VEHICLE THEFT PER CAPITA DIVIDED BY MEAN OF POVERTY LEVEL

- Due to the continuous discrete nature of the data the PMF is equal for each value.
- The observations of motor vehicle theft in cities with Poverty over the mean had significantly higher MV theft per capita.



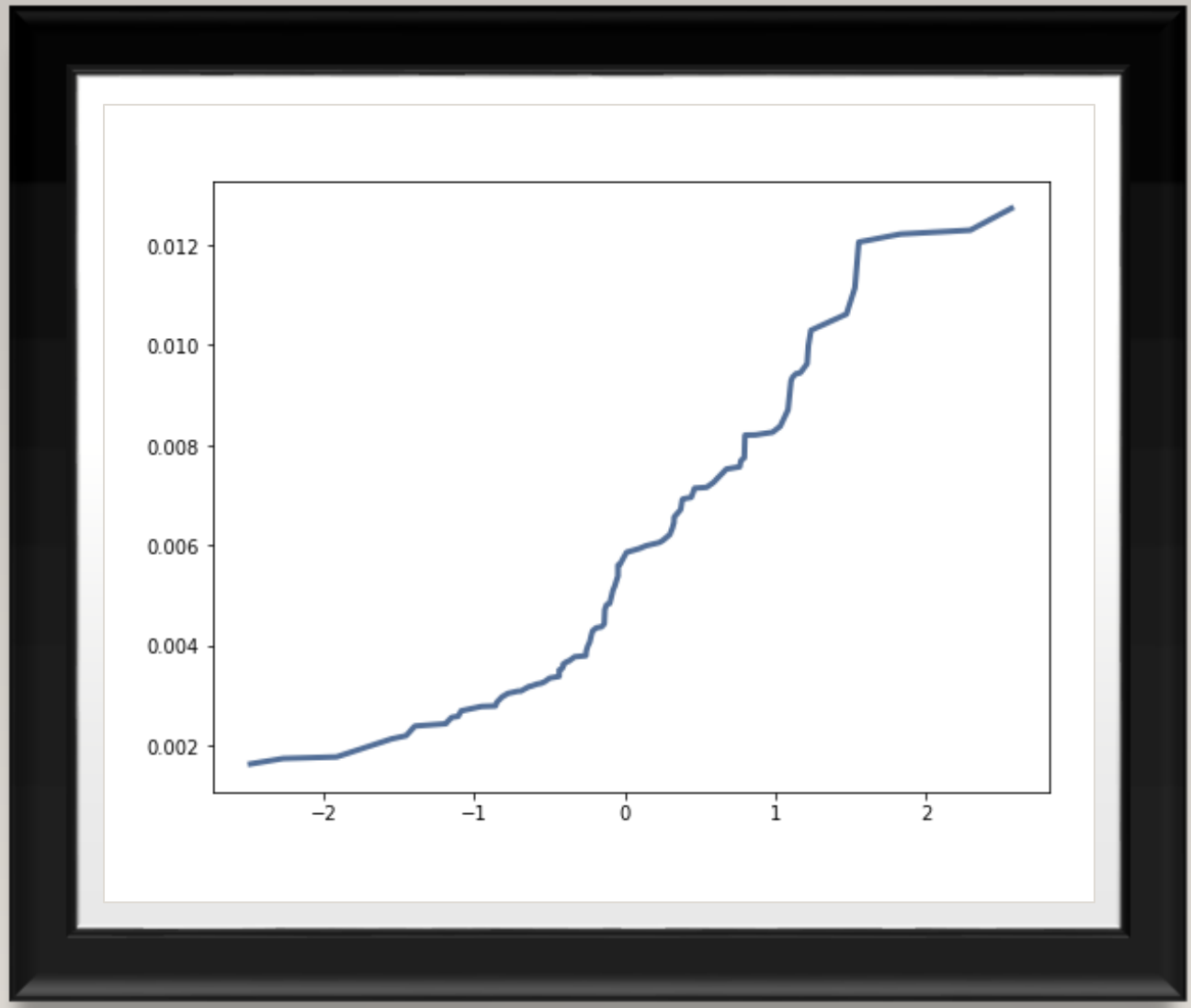
'LARCENY PER CAPITA CDF'

- 80% of 'Larceny-theft per capita' is less than 0.025
- The vast majority of cities see larceny per capita values of less than 0.025
- There are however 20% of observation have from .04 to .05 values. a significant jump



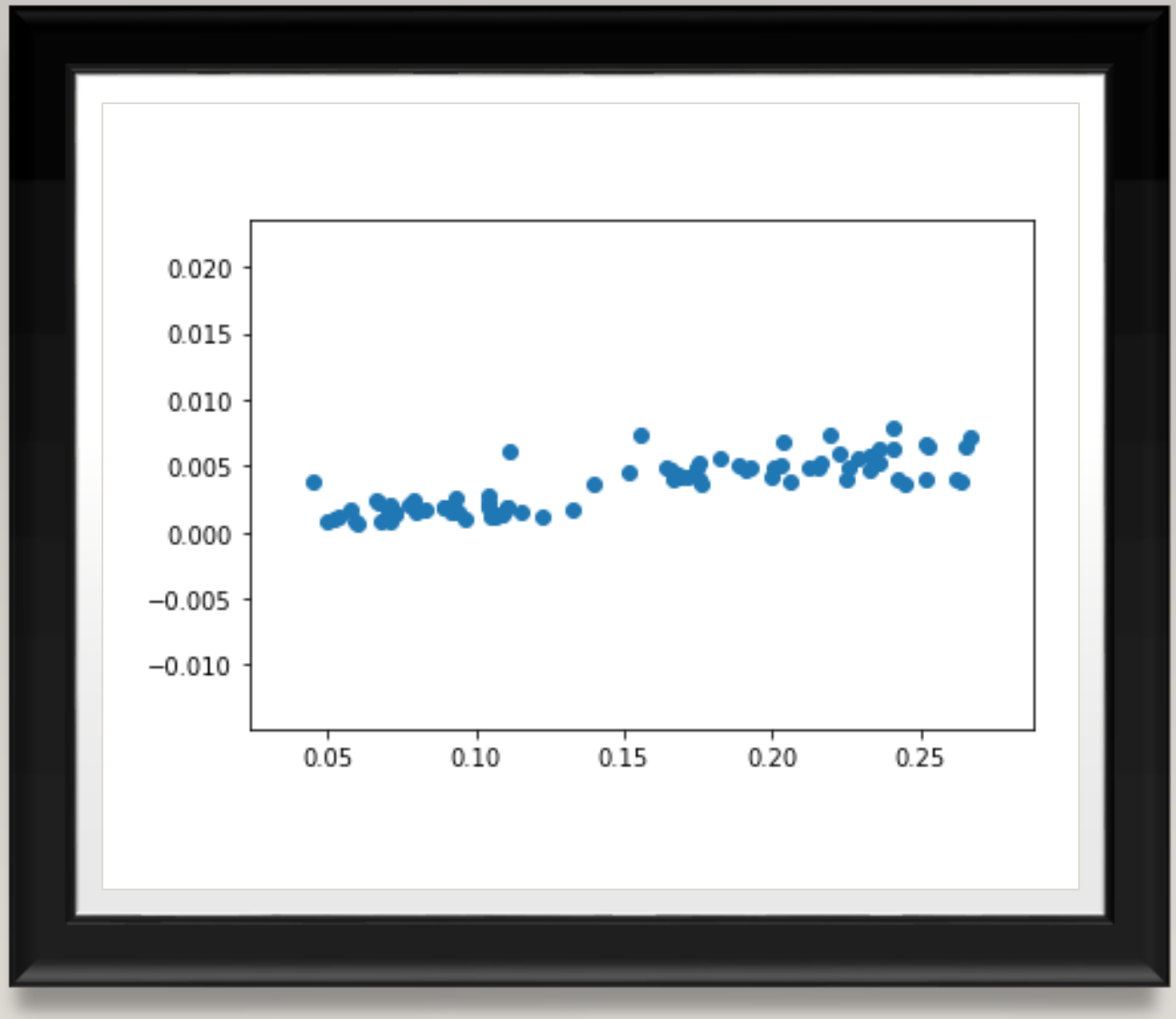
NORMAL PROBABILITY PLOT OF BURGLARY PER CAPITA

- # The normal probability plot shows that burglary per capita is surprisingly close to normal
- #it also indicates that there are fewer samples of burglary per kapita between .003 and .005 than expected
- #a more pronounced deficit in value distribution between 0.010 and 0.012 than expected



CORRELATION/CAUSATION POVERTY AND VIOLENT CRIME

- #the scatterplot between poverty and violent crime shows a slightly positive correlation
- With a 1:1 scaled access the positive correlation is almost unnoticeable
-



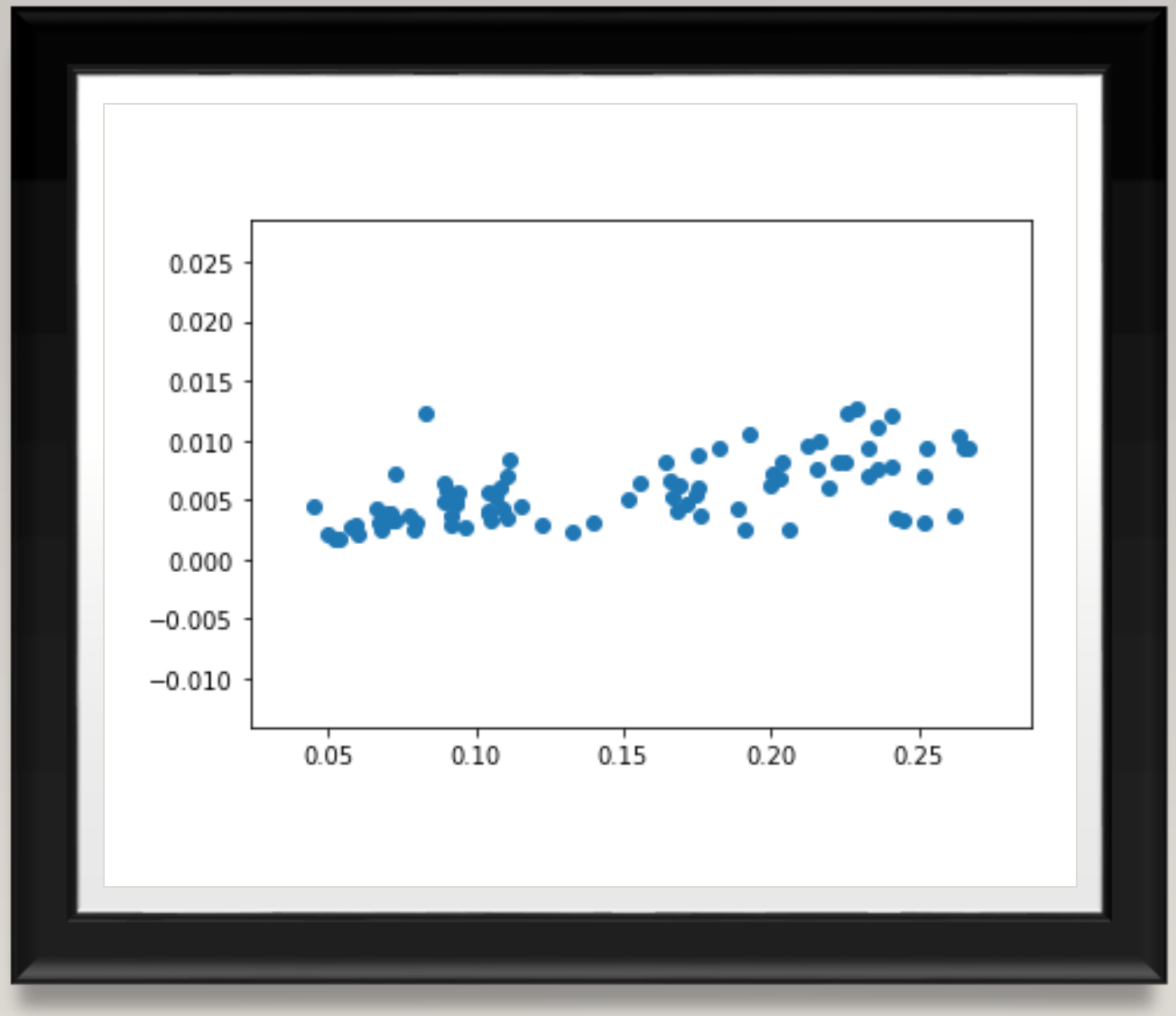
CORRELATION/CAUSATION POVERTY AND VIOLENT CRIME

- The correlation between the two have a fairly strong correlation and a very significant P value
- This indicates that as poverty levels increase so do per capita violent crimes

SpearmanrResult(
correlation=0.7855580666326456,
pvalue=2.0834667341456 72e-19)

CORRELATION/CAUSATION POVERTY AND BURGLARY

- #The scatter plot also shows a much weaker positive corr between increased poverty and burglary
-



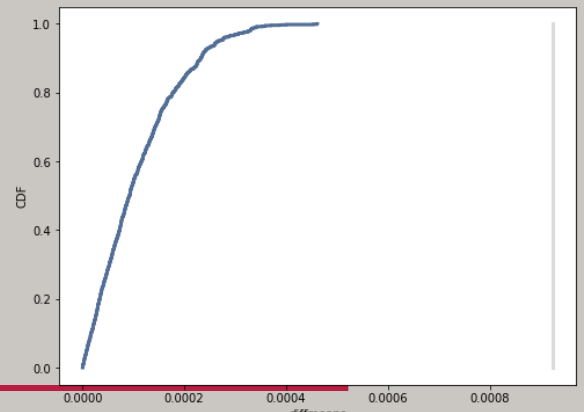
CORRELATION/CAUSATION POVERTY AND BURGLARY

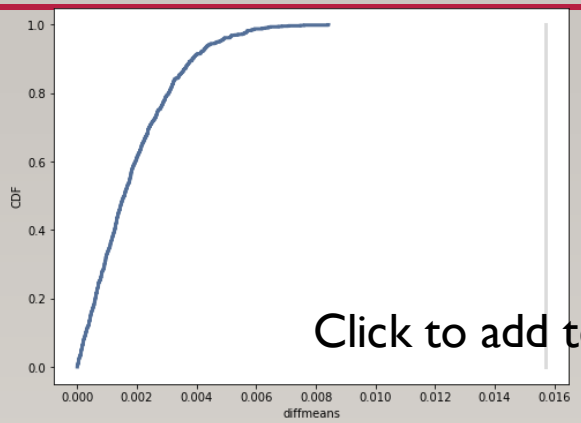
- The correlation between the two is teetering in-between strong and weak
- The P value shows significance, the correlation arguable

SpearmanrResult(
correlation=
0.5852956185754902,
pvalue=
2.6184425815328056e-09)

DIFFERENCE OF MEANS HYPOTHESIS TEST

The observations are separated by over and under mean poverty on each variable
All P values for each variable is 0 or less than 0.001 and therefor the difference is statistically significant





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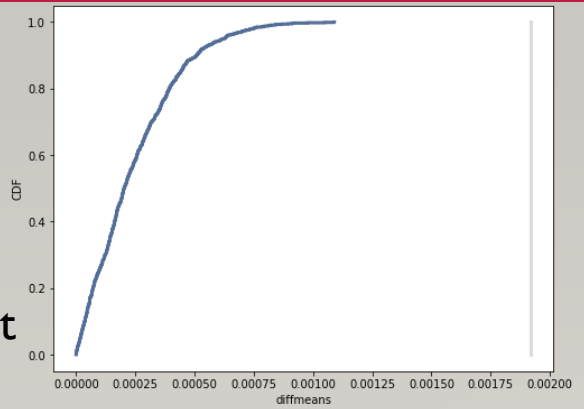

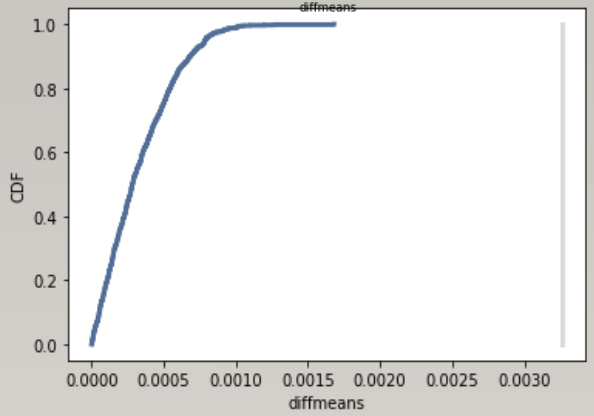

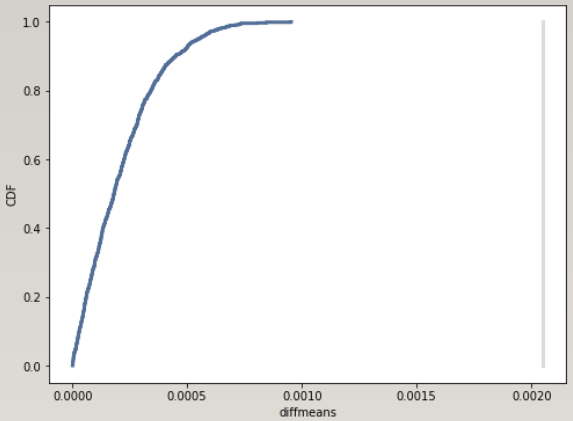

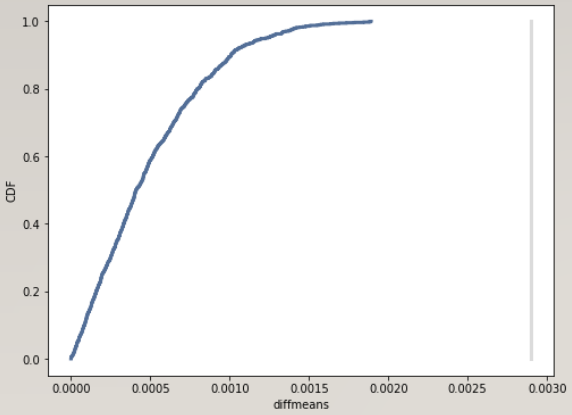

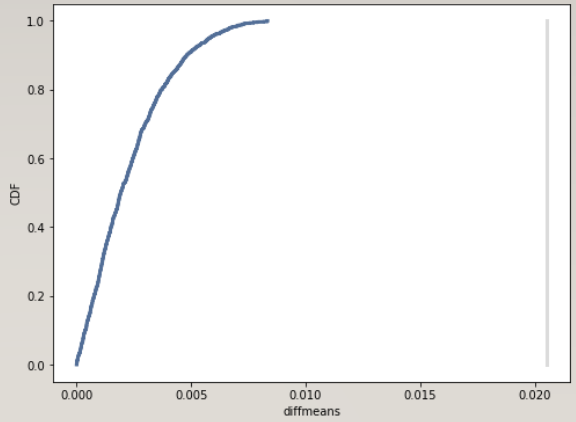

MULTIPLE REGRESSION

- 'ratio_below_poverty_line ~ Violent_crime_per_capita + Robbery_per_capita + Aggravated_assault_per_capita + Property_crime_per_capita + Burglary_per_capita + Larceny_theft_per_capita + Motor_vehicle_theft_per_capita '

RESULTS

- #with an r2 of 0.786 the coefficient of determination point towards poverty levels rising with crime
- #taking into account the number of independent variables the adjusted r2 shows similar level of explanation
-

Dep.Variable:	below_poverty_line	R-squared:	0.786
Model:	OLS	Adj. R-squared:	0.769
Method:	Least Squares	F-statistic:	47.71
Date:	Wed, 05 Aug 2020	Prob (F-statistic):	4.04e-24
Time:	01:59:19	Log-Likelihood:	175.22
No. Observations:	85	AIC:	-336.4
Df Residuals:	78	BIC:	-319.3
Df Model:	6		
Covariance Type:	nonrobust		

STANDARD ERROR

- #Violent crime, Roberty, assault all have high standard error values
- Therefore these variables have greater spread/less contribution to the correct regression fit.

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	0.0208	0.012	1.790	0.077	-0.002	0.044
Violent_crime_per_capita	-3.3948	26.248	-0.129	0.897	-55.650	48.860
Robbery_per_capita	46.2898	35.463	1.305	0.196	-24.312	116.891
Aggravated_assault_per_capita	22.0815	28.869	0.765	0.447	-35.391	79.554
Property_crime_per_capita	-1.9703	1.578	-1.248	0.216	-5.113	1.172
Burglary_per_capita	4.2785	3.026	1.414	0.161	-1.747	10.304
Larceny_theft_per_capita	4.6259	1.571	2.945	0.004	1.499	7.753
Motor_vehicle_theft_per_capita	-10.8747	5.551	-1.959	0.054	-21.925	0.176