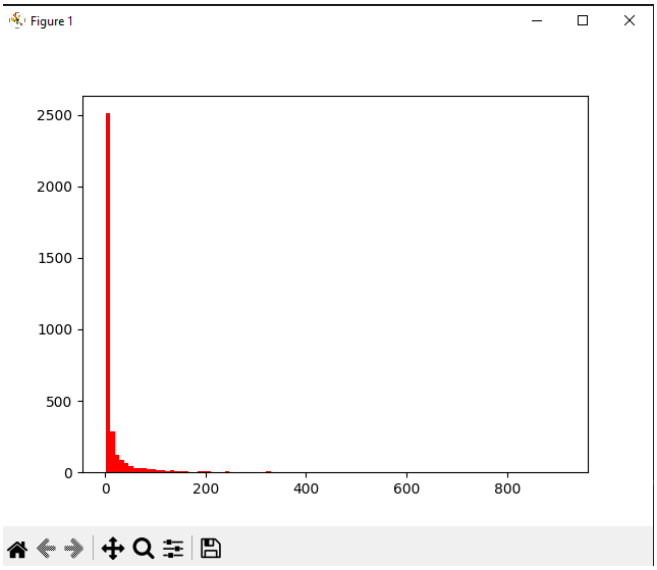
Nicole Kayambu
4341-02

Problem 1.

Airport data:

- What is the α if the distribution is power law?
  1.612
- What is the λ if the distribution is exponential?
  .050
- What is [a, b] if the distribution is uniform?
  [1, 915]
- What is μ and σ if the distribution is normal?
  μ = 19.845
  σ = 53.506
- Screen shot of the visualization of distribution of data



(These can be CDF, PDF, or QQplot)

- Screen shot of the visualization of distribution of data if it was power law

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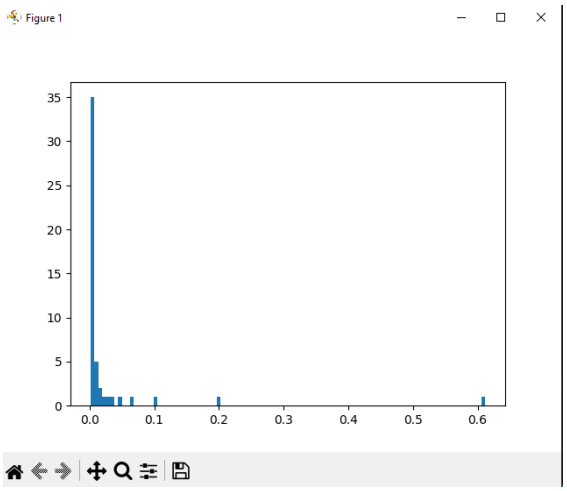
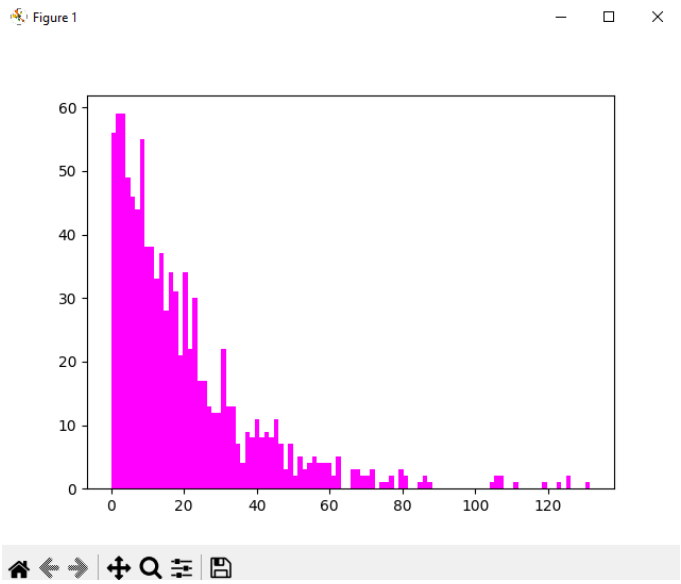


- Screen shot of the visualization of distribution of data if it was exponential



- Screen shot of the visualization of distribution of data if it was uniform

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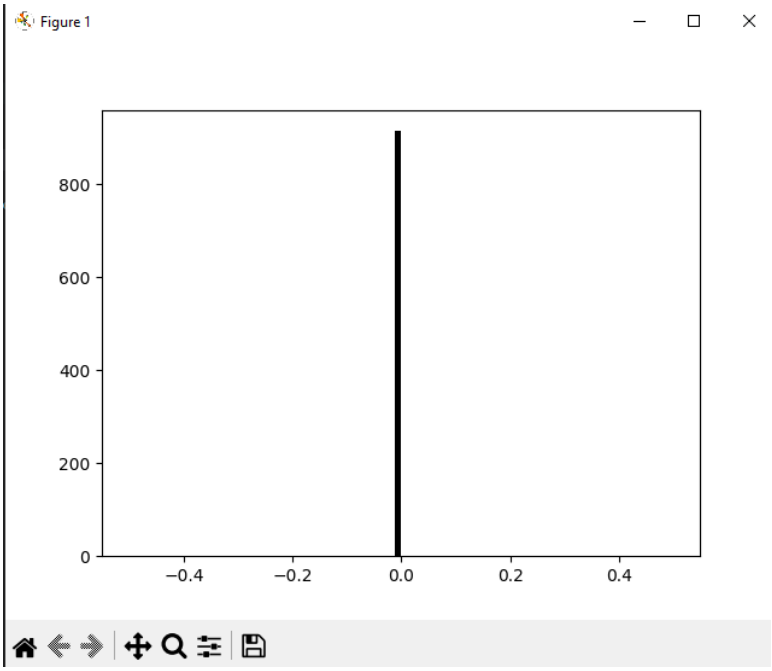
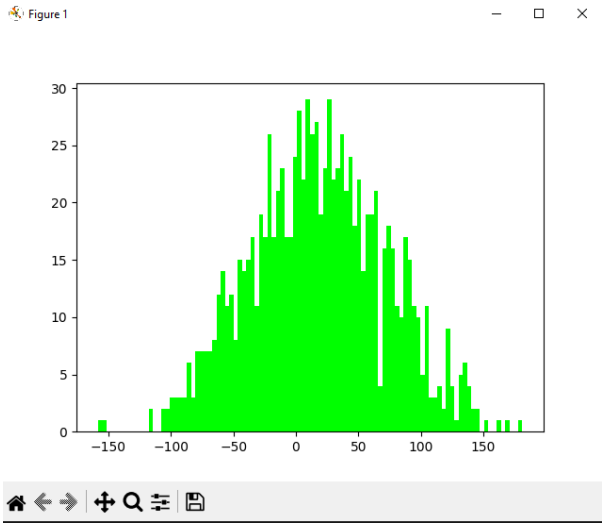


- Screen shot of the visualization of distribution of data if it was normal



- What is the distribution of data based on your observation? Discuss

The distribution of the data is based on power law theory as the actual graph of the data matched the hypothetical graph of the power law theory based on the data the most. However, Q-Q plot seems to show that the distribution follows uniform distribution the most.

Q-Q of Power Law Theory

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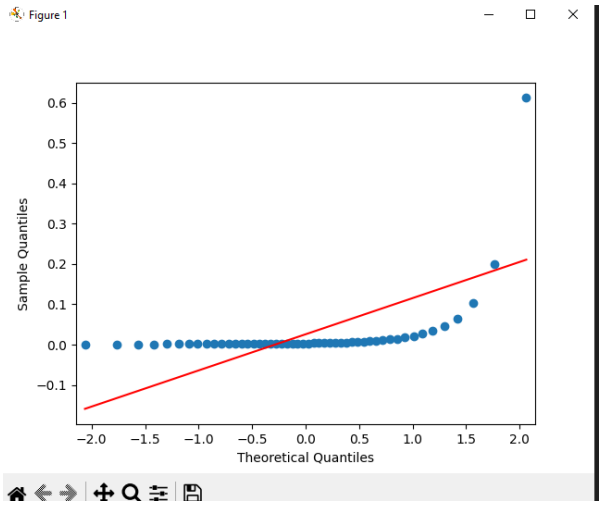
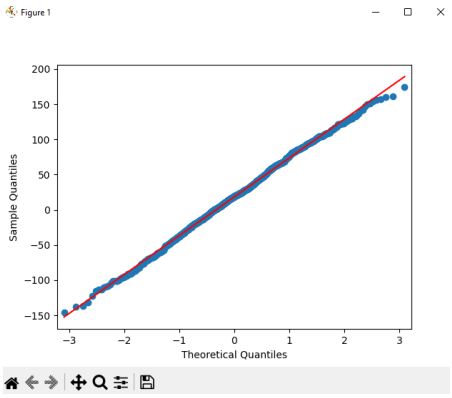
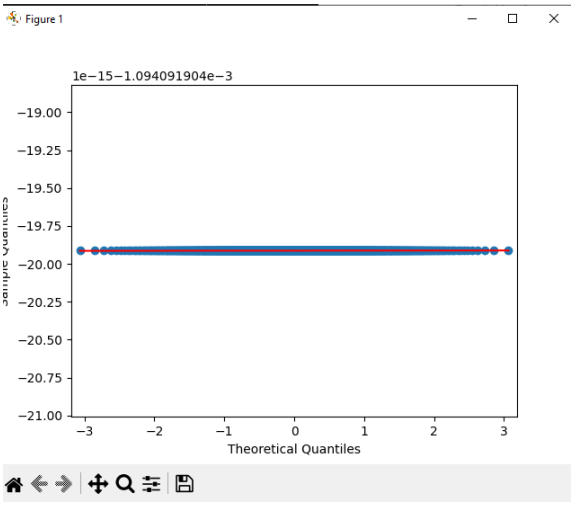


Q-Q plot of Normal Distribution



Q-Q plot of Uniform Distribution



Q-Q plot of Exponential Distribution

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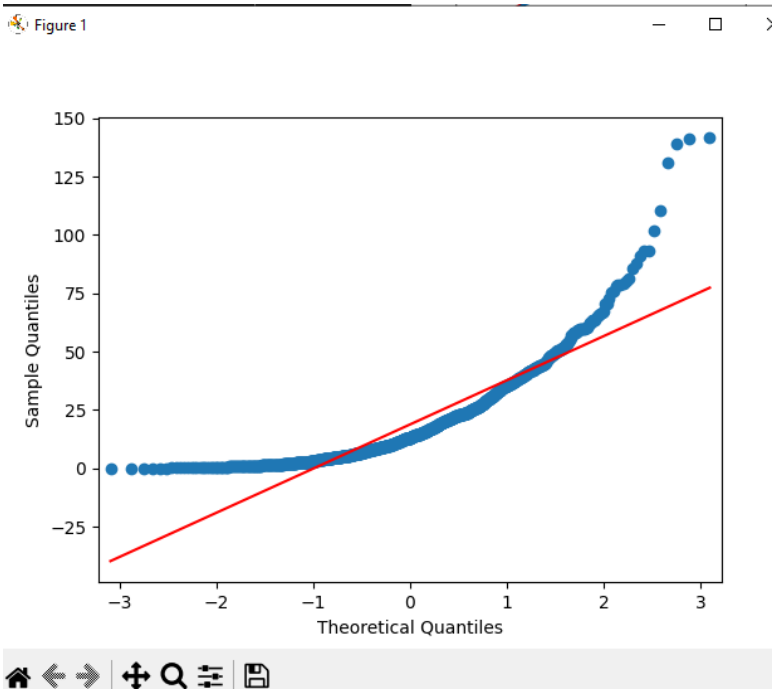

Movie Rating data:

- What is the α if the distribution is power law?
  1.850
- What is the λ if the distribution is exponential?
  0.161
- What is [a, b] if the distribution is uniform?
  [1.9, 8.5]
- What is μ and σ if the distribution is normal?
  μ = 6.227
  σ = 0.893
- Screen shot of the visualization of distribution of data

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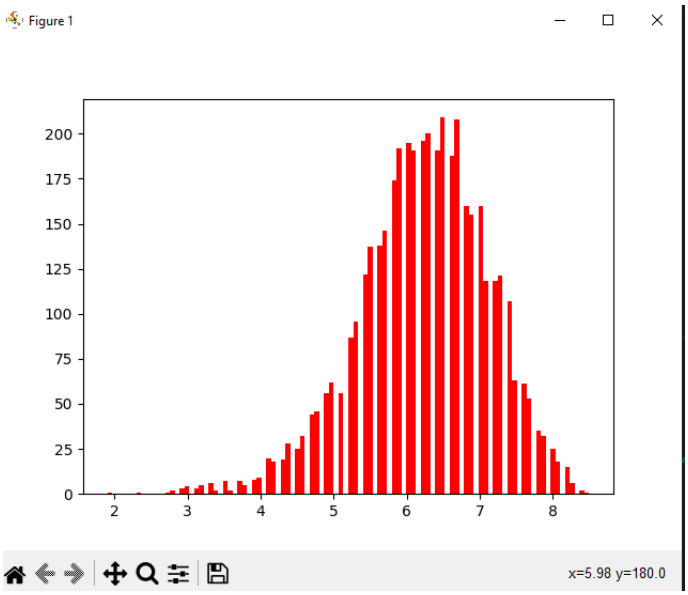
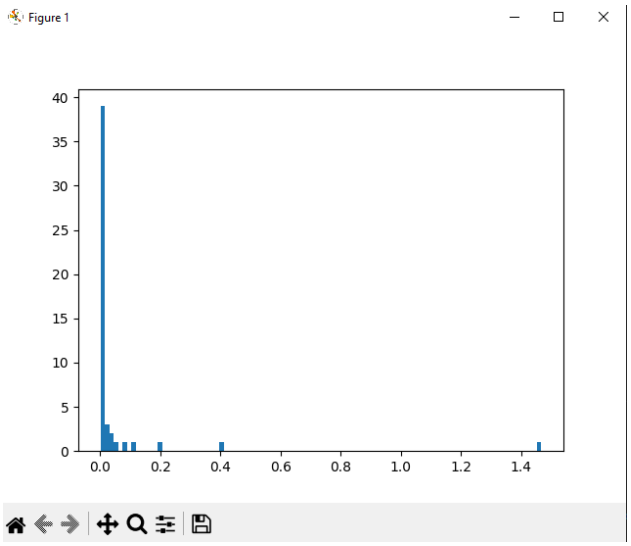


(These can be CDF, PDF, or QQplot)

- Screen shot of the visualization of distribution of data if it was power law



- Screen shot of the visualization of distribution of data if it was exponential

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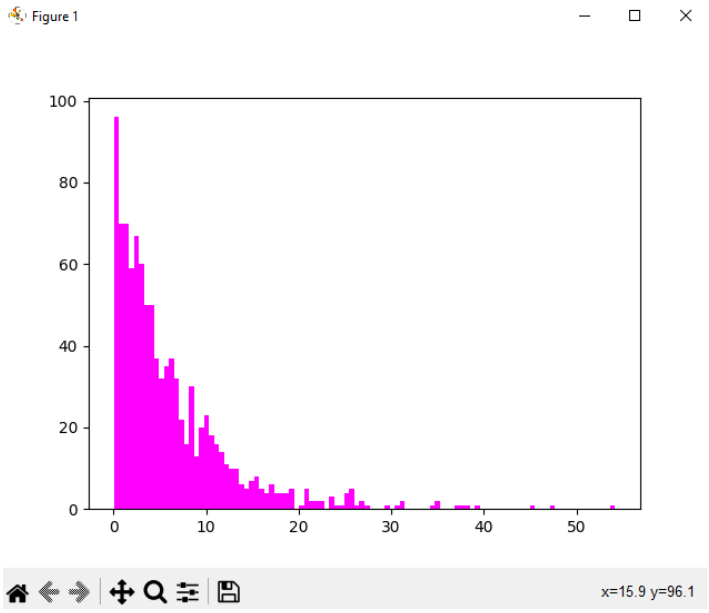
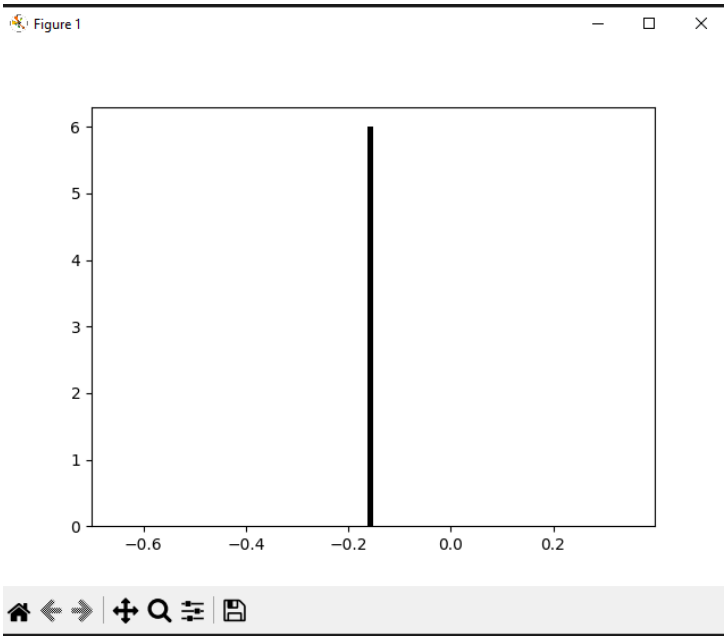


- Screen shot of the visualization of distribution of data if it was uniform



- Screen shot of the visualization of distribution of data if it was normal

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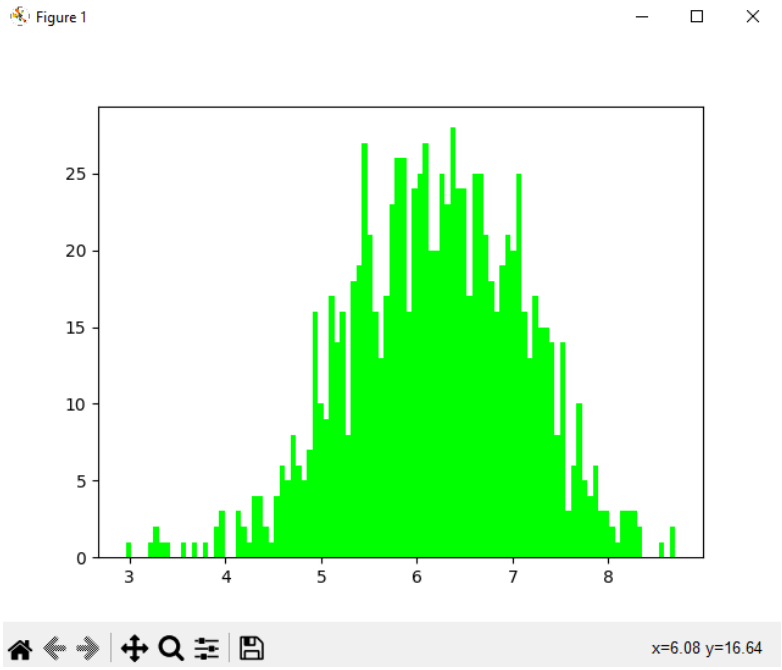

- What is the distribution of data based on your observation? Discuss

  The distribution of the data is normal since the graph of the hypothetical normal distribution based on the data matched the graph of the data the best. This can also be seen with the Q-Q plot of the normal distribution as if follows closely to the center line.

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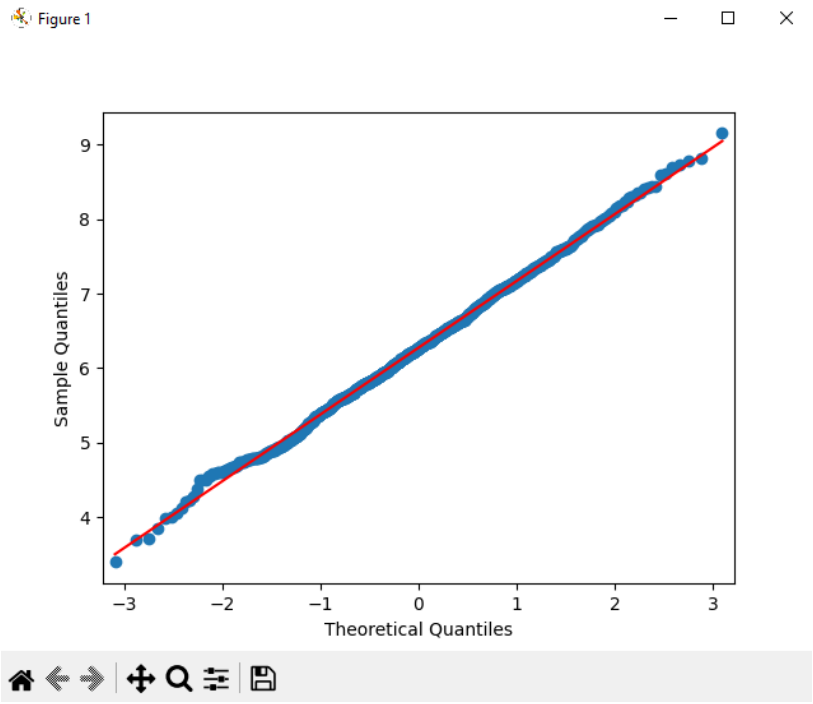
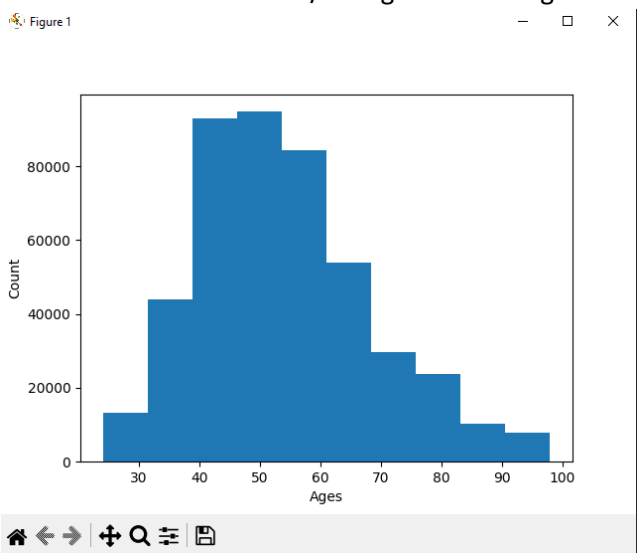
Q-Q plot of Normal Distribution



Problem 2.

- Screenshot of distribution/histogram of the age



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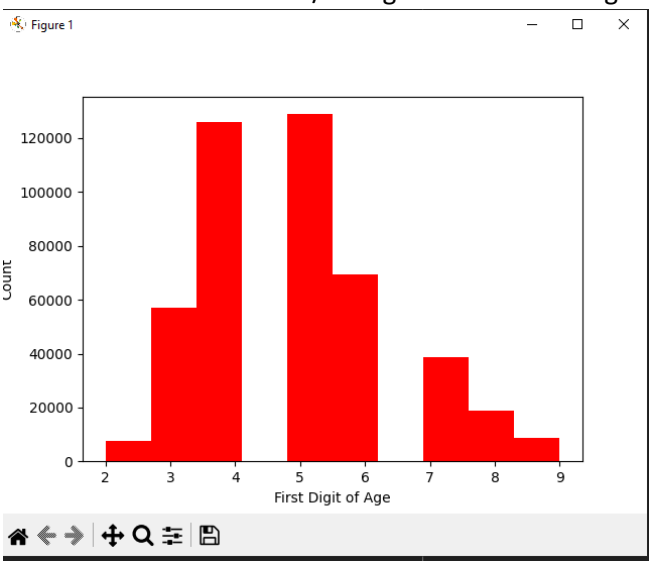
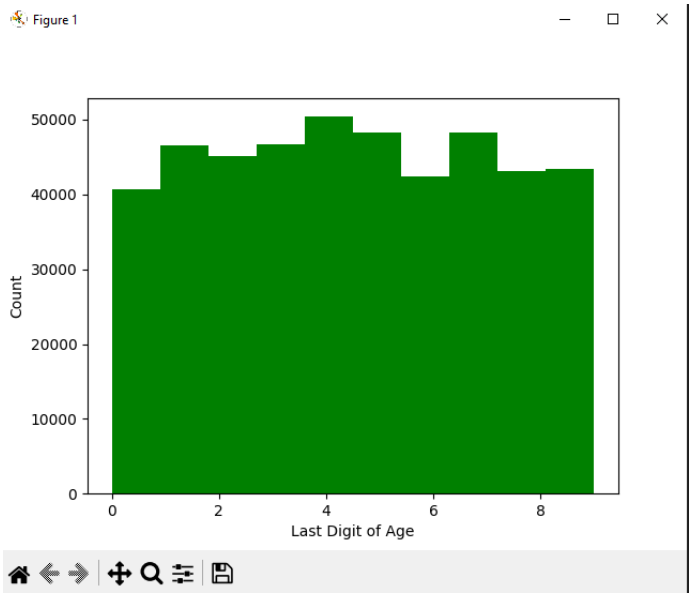
- Screenshot of distribution/histogram of the first digit of age



- Screenshot of distribution/histogram of the last digit of age



- Discussion (what are those distribution?) Why do you think it is like this?

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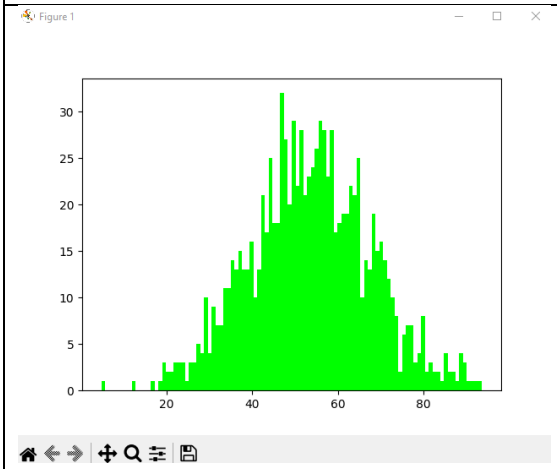
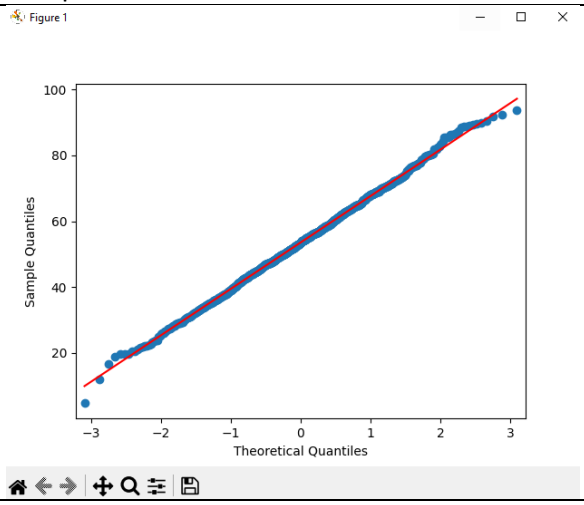
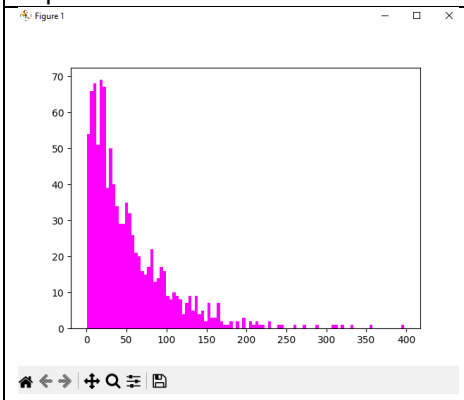
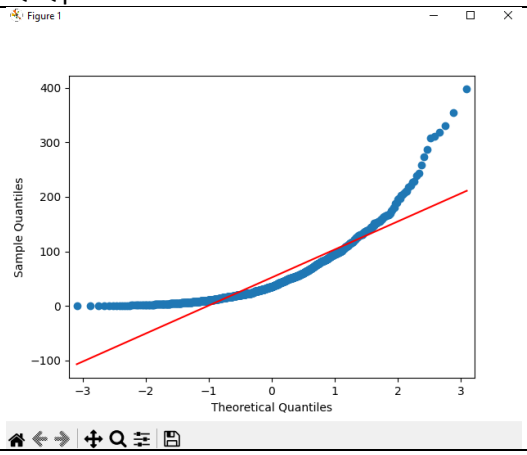
They all seem to follow the uniform distribution as seen by the plots of their data and Q-Q plots together.

Filtered Ages

Normal Distribution	Q-Q plot
	

Exponential Distribution	Q-Q plot
	

Uniform Distribution	Q-Q plot

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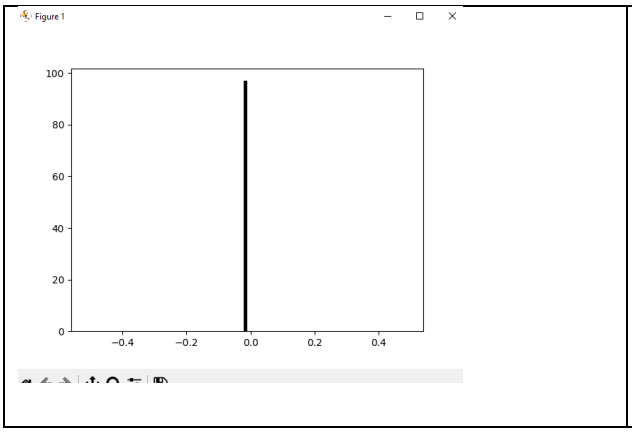
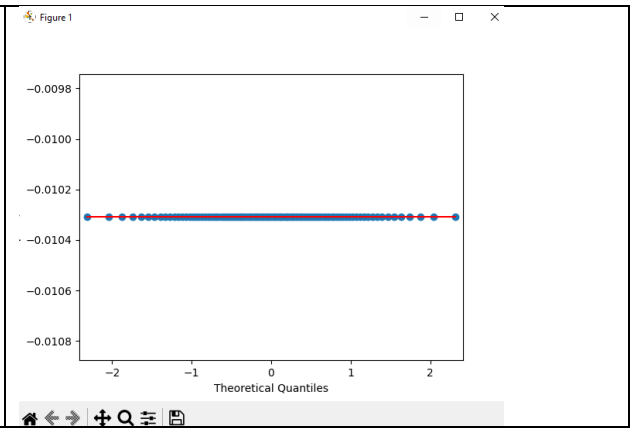
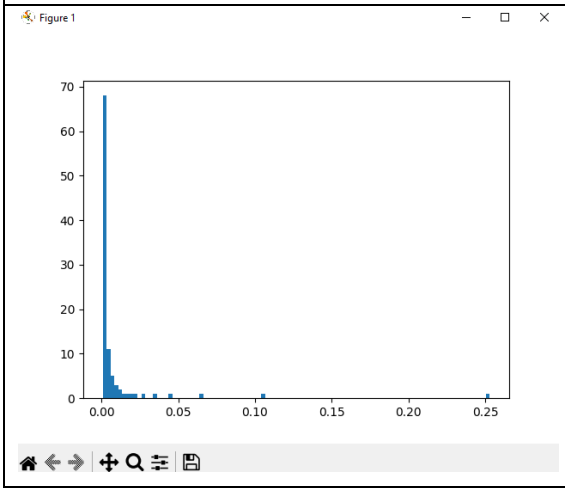
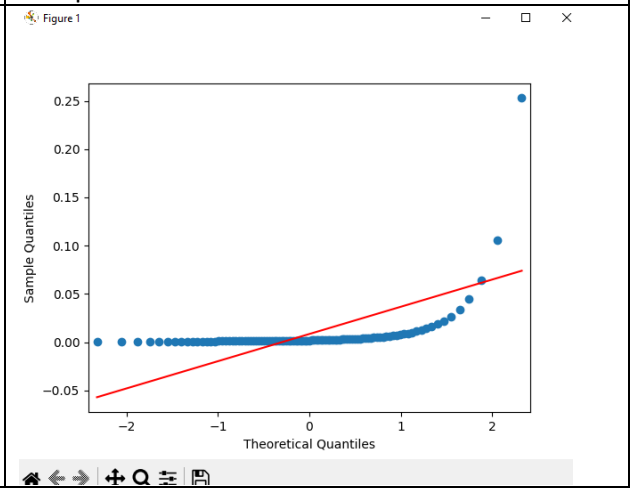




Power Law Distribution	Q-Q plot





First Digits

Normal Distribution	Q-Q plot

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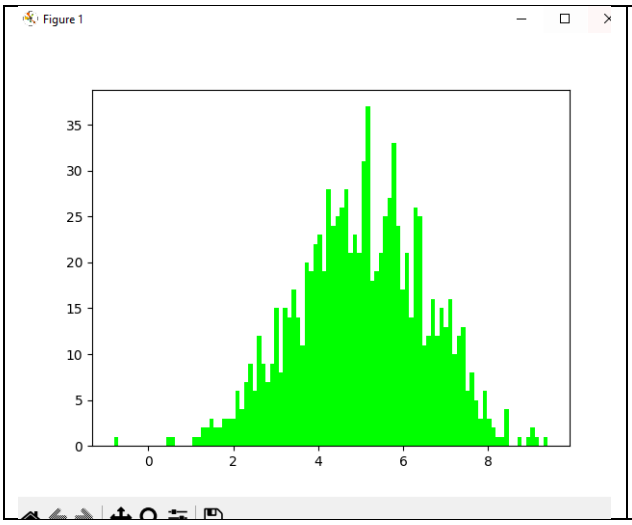
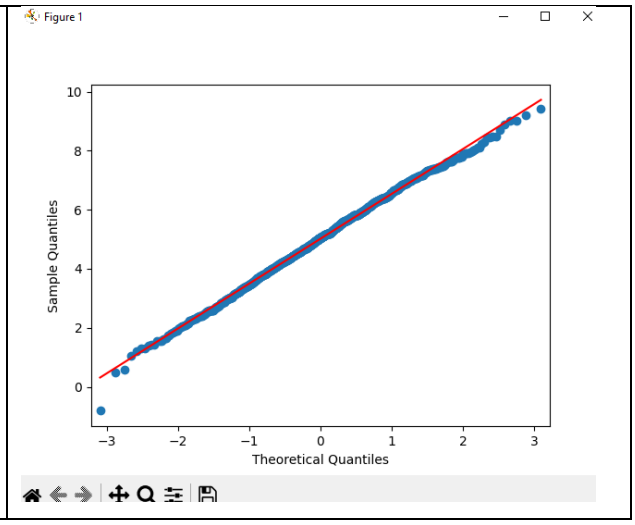
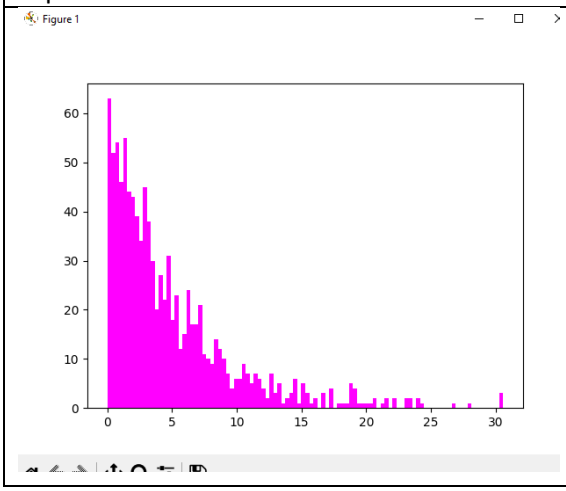
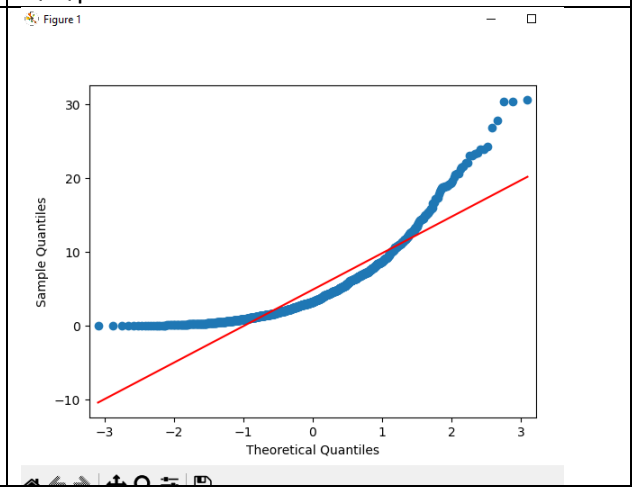




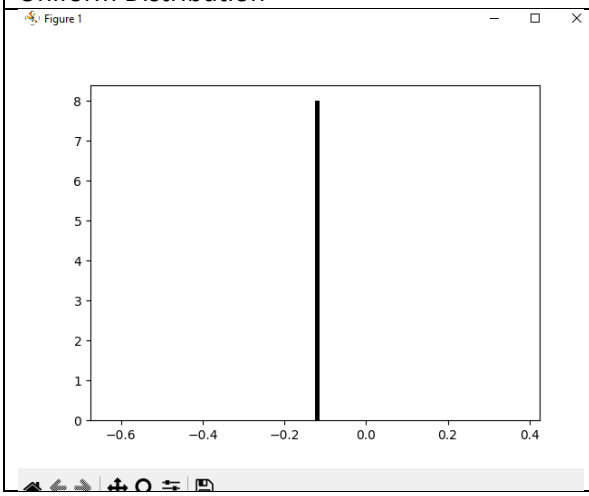
Exponential Distribution



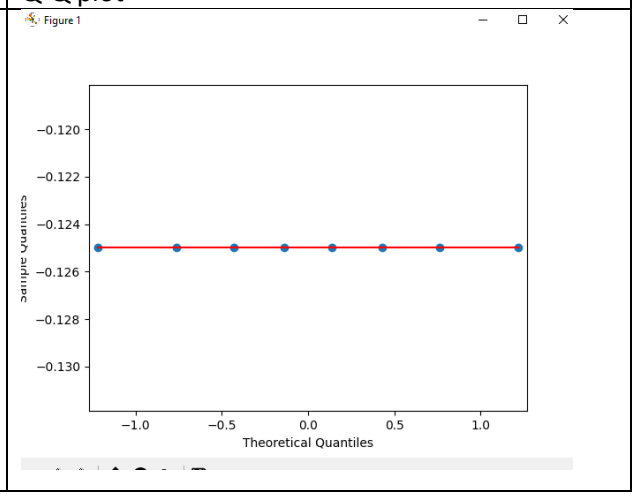
Q-Q plot



Uniform Distribution



Q-Q plot



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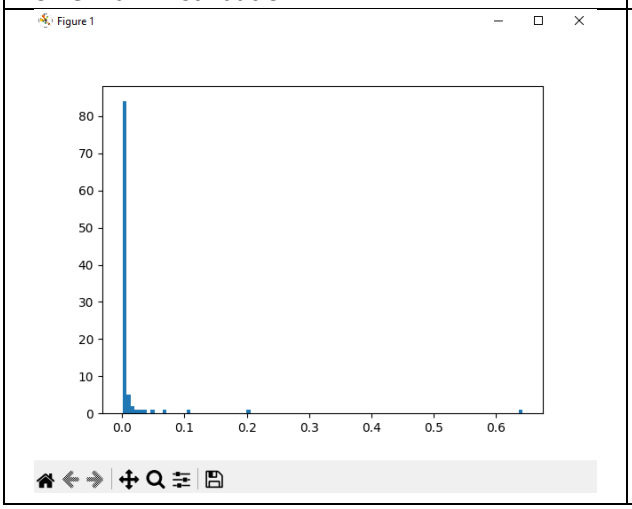
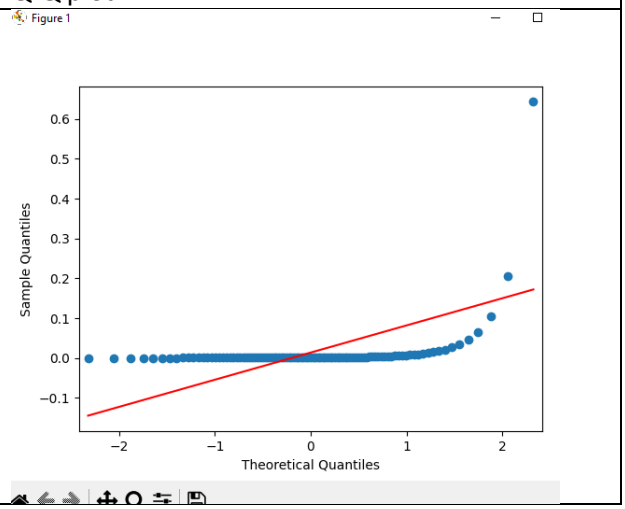
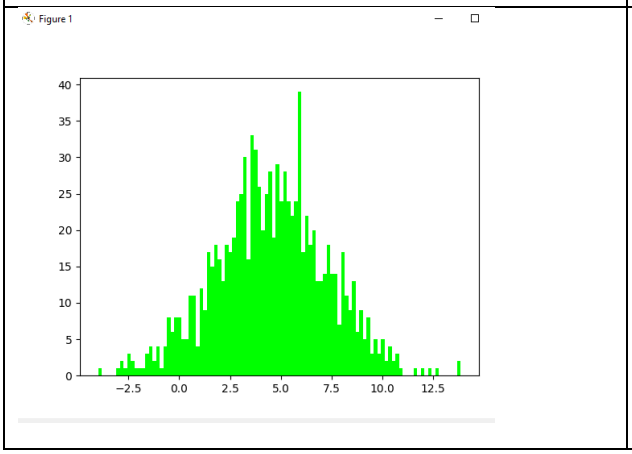
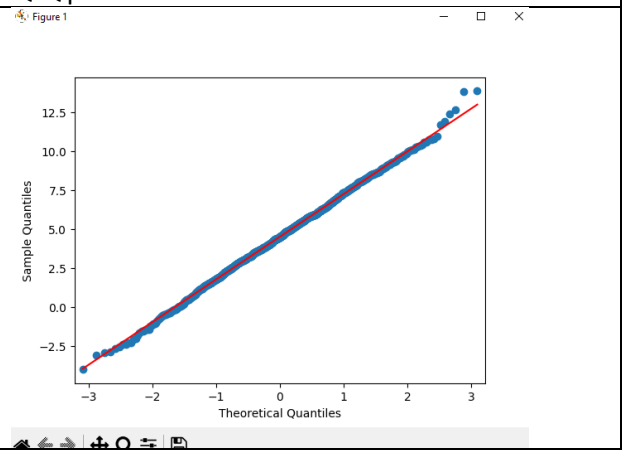
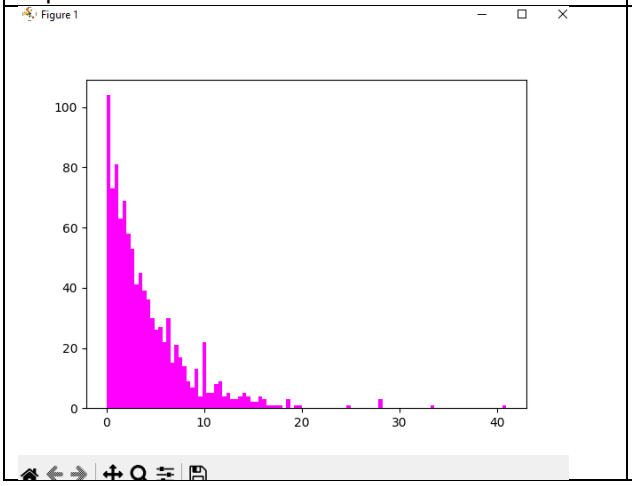
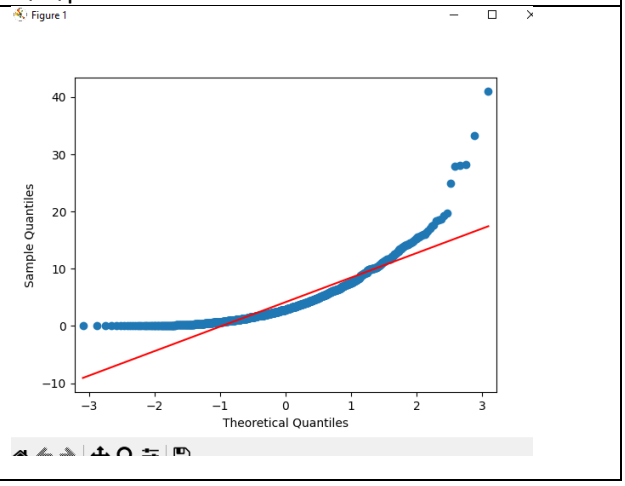
Power Law Distribution	Q-Q plot
	

Last Digits

Normal Distribution	Q-Q plot
	

Exponential Distribution	Q-Q plot
	

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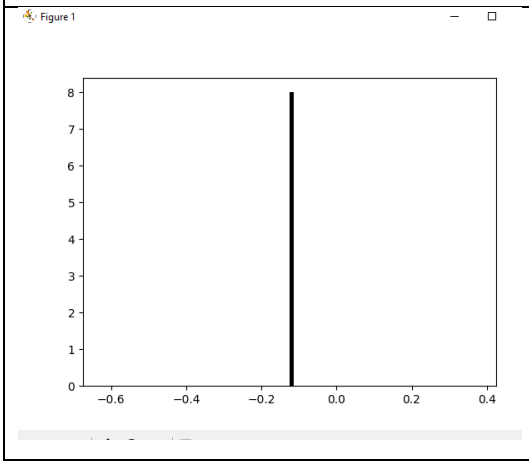
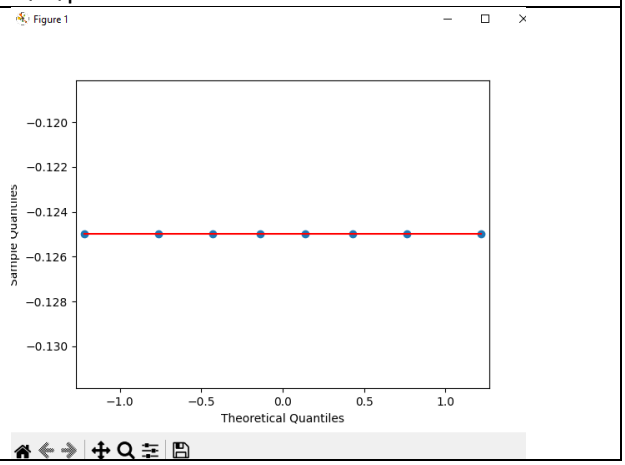
Uniform Distribution	Q-Q plot
	

Power Law Distribution	Q-Q plot