Project 2 of CSE 473/573

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# Task 1

# Task2

# Task3

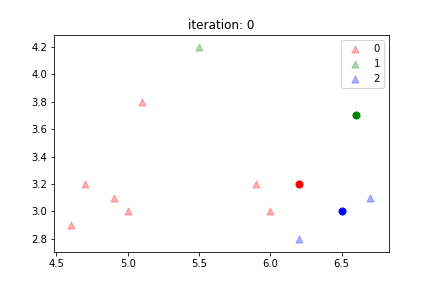
### Part a: K-means Clustering

There are total two iterations for the given data as shows below.

**Iteration 0:**

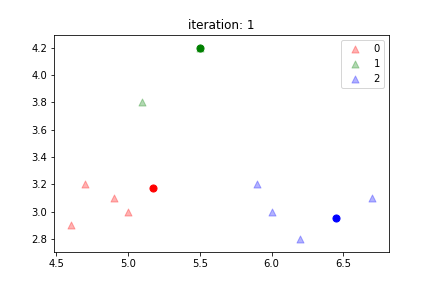
This shows the clusters’ center location which represents the mu in report.

[cluster: [6.2 3.2], cluster: [6.6 3.7], cluster: [6.5 3. ]]



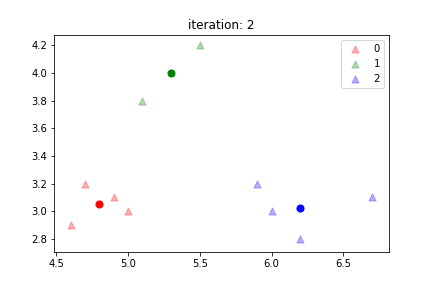
**Iteration 1:**

[cluster: [5.17142857 3.17142857], cluster: [5.5 4.2], cluster: [6.45 2.95]]



Iteration 2:

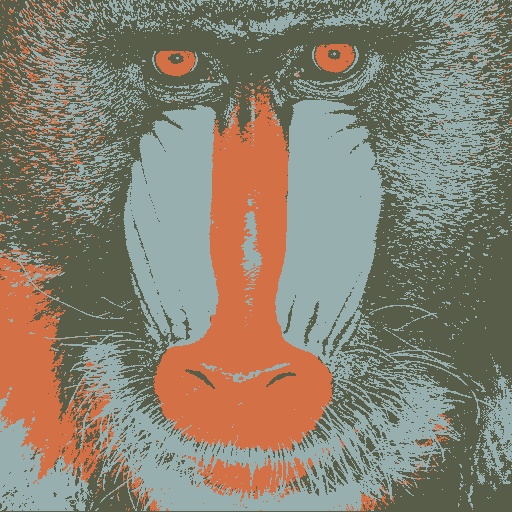
[cluster: [4.8 3.05], cluster: [5.3 4. ], cluster: [6.2 3.025]]



**Color Quantization(code saved in k\_mean\_img.py):**

For the purpose to save paper, I have resized the image in report. If you want to see the original image, please go to task3\_img folder. Thank you

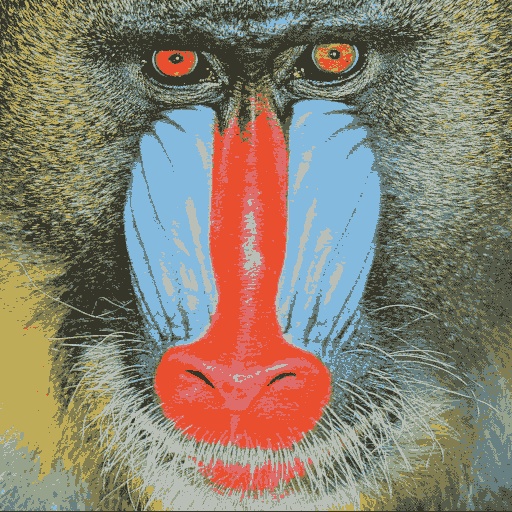
**K = 3:**

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**k = 5**

****

**k = 10**

****

**k=20**

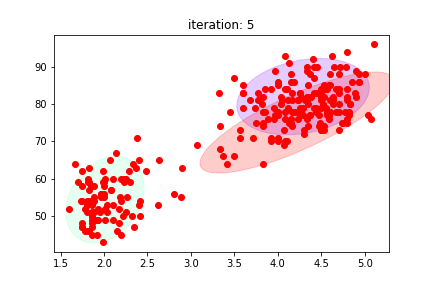
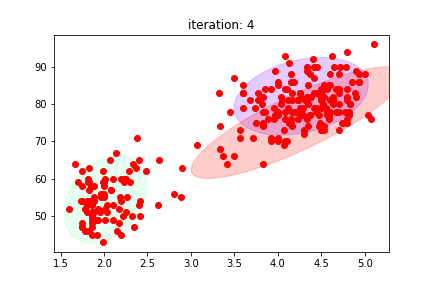
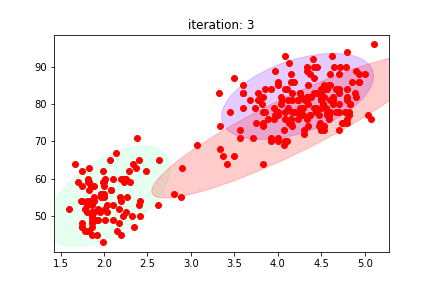
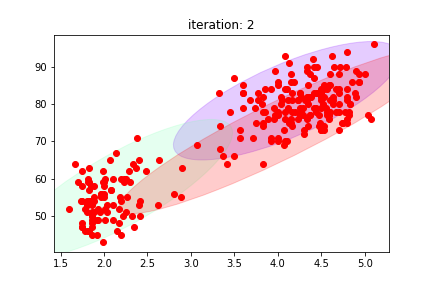
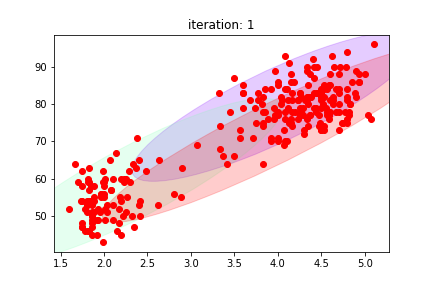
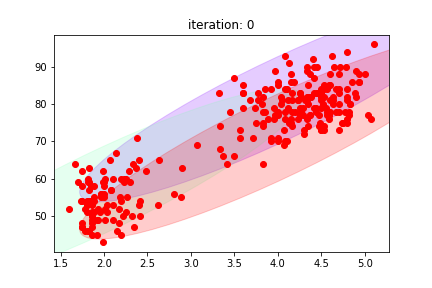
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### Part b: Gaussian Mixture Model

**Question a: what is the u\_i after the first iteration?**

[5.3165079 3.21527292] [5.61129795 3.38505311] [5.60443565 3.14420061]

**Question b: Include first five plots for faithful data.**



## Appendix, my library: mycv.py and mynumpy.py