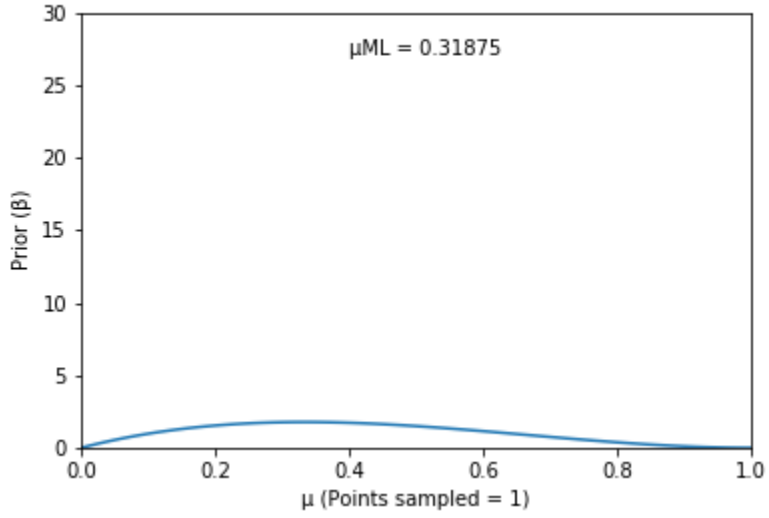
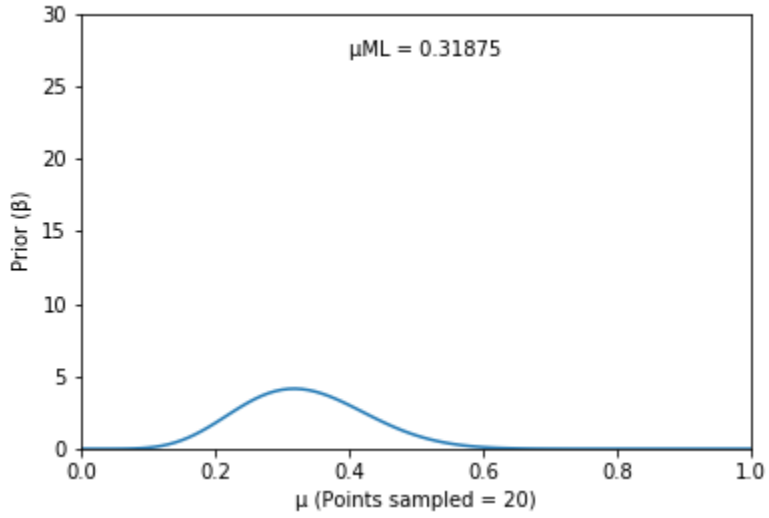
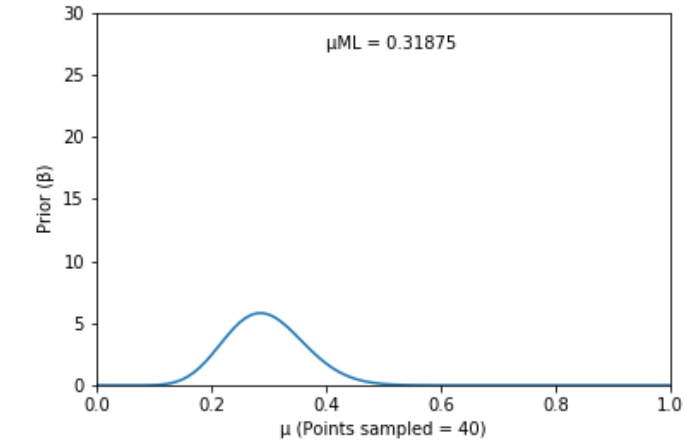
- The Dataset is generated such that $\mu_{ML} \in [0, 0.4) \cup (0.6, 1.0]$
- For the Prior (Beta Distribution): a = 2*k, b = 3*k, => Mean = 2/(2+3) = 0.4

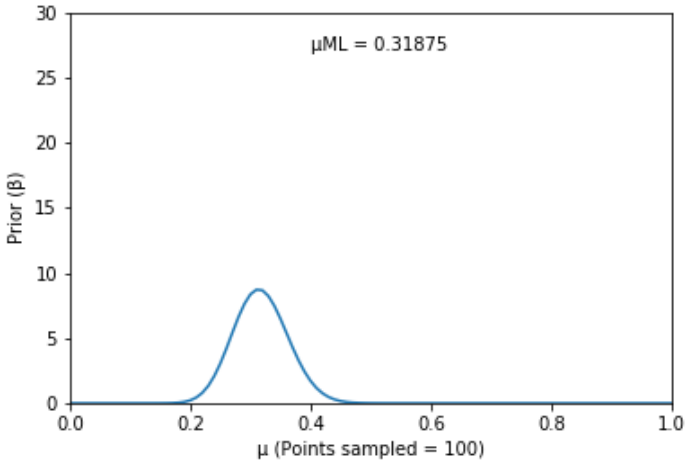
A- Sequential Learning:

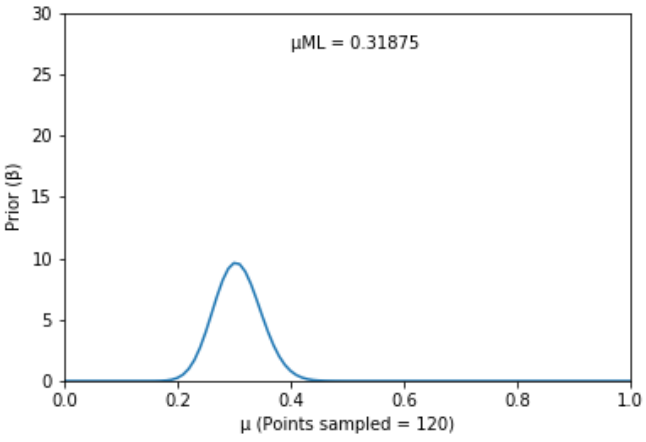
- 'Part_A_Code.py' generates plots of Prior vs μ for N = 160 data points and saves the data in the directory - 'Image Data'
- 'Part_A_GIF_Maker.py' combines the plots generated in the previous step into a GIF.

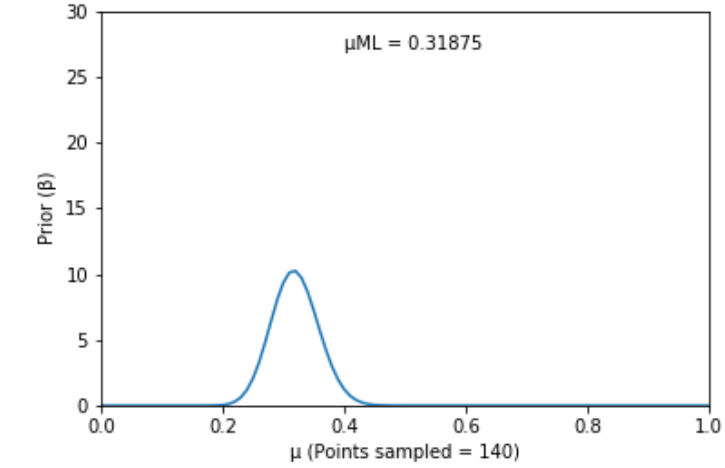


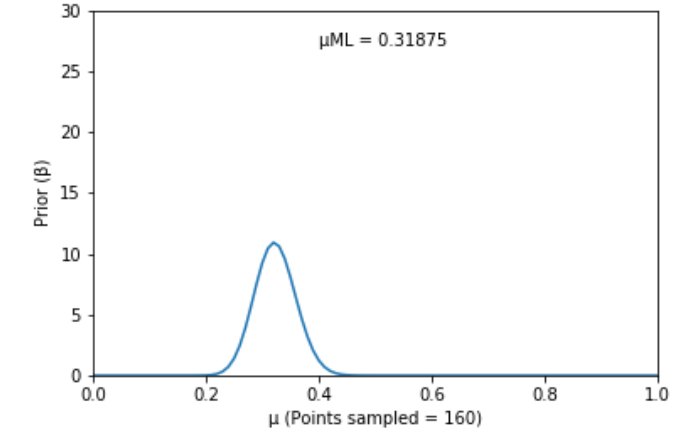



μML = 0.31875
Prior (β)
μ (Points sampled = 40)

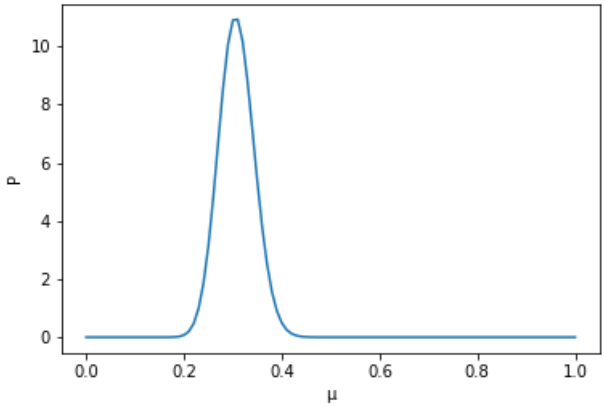

μML = 0.31875
Prior (β)
μ (Points sampled = 100)


μML = 0.31875
Prior (β)
μ (Points sampled = 120)


μML = 0.31875
Prior (β)
μ (Points sampled = 140)


μML = 0.31875
Prior (β)
μ (Points sampled = 160)

Part- B:


P
μ

Part- C:

- The formula used is:

$$p(\mu|m,l,a,b) = \frac{\Gamma(m+a+l+b)}{\Gamma(m+a)\Gamma(l+b)}\mu^{m+a-1}(1-\mu)^{l+b-1}$$

- At the end of sequential learning (Part-A): l + m = N. Therefore, the graphs for Part-A become identical to the graph of Part- B as number of points sampled → 160.
- As the value of N is increased above 160, the Gamma Function increases and makes the value of the entire function → ∞
- At μ_{ML} = 0.5, the following plot is obtained-