IoT Analytics

Project 5 – Hidden Markov Model (Extra Credit)

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The objective of this task is to vary the number of states and plot the Likelihood, AIC and BIC against the number of states.

In this task we varied the states and hence the parameters also increased and using these calculated observations we calculated the probability that is the likelihood, AIC and BIC of the states

We varied the states from 2 to 802 in the increments of 100 states each taking into consideration only 12 observations for each state and noted down the values which is shown below

The probability or the likelihood is given as below

```
[1.8176004575499974e-06, 1.205258860657087e-06, 2.222031740437012e-06, 2.6494952231632977e-06,
3.1141725638528515e-06, 2.2585348280734723e-06, 1.6016917687919363e-06, 3.0374269173961074e-06]
```

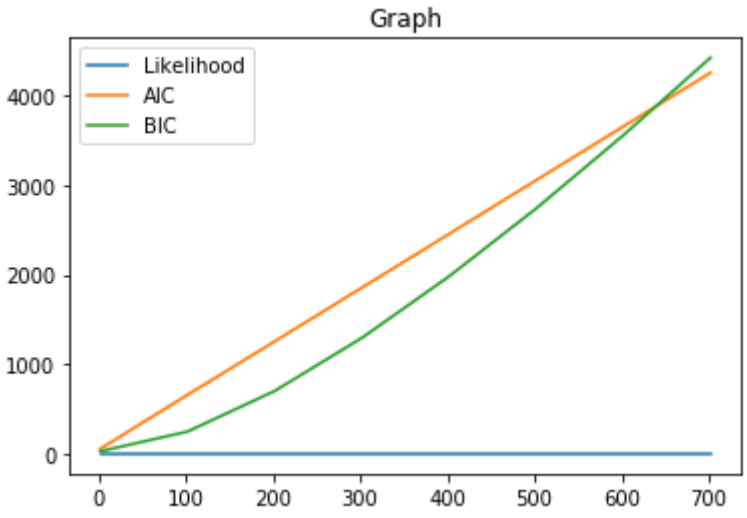
The AIC of the HMM is

```
[54.43598671337311, 655.2576323839411, 1254.0341771644476, 1853.6822828358706, 2453.359094141185,
3054.0015885221674, 3654.6889002636603, 4253.408999619407]
```

The BIC of the HMM is

```
[26.435986713373115, 244.90584707976393, 700.5821224066668, 1292.7553288994507, 1979.2167198361826,
2738.7254249334424, 3556.5699106499987, 4421.348418730579]
```

The graph between states and the Likelihood, AIC and BIC values can be seen below



From the graph we can see that the likelihood is too low for the considered set of observations and the lower value of AIC and BIC constitutes a good fit.