BT6270: Assignment - 1

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A1)

Threshold values obtained (I1, I2, I3):

- I1 = 0.023 A : No AP => AP
- I2 = 0.06 A : AP => Multiple AP's
- I3 = 0.45 A : Multiple AP's => No more AP's

These values were obtained by the following procedure:

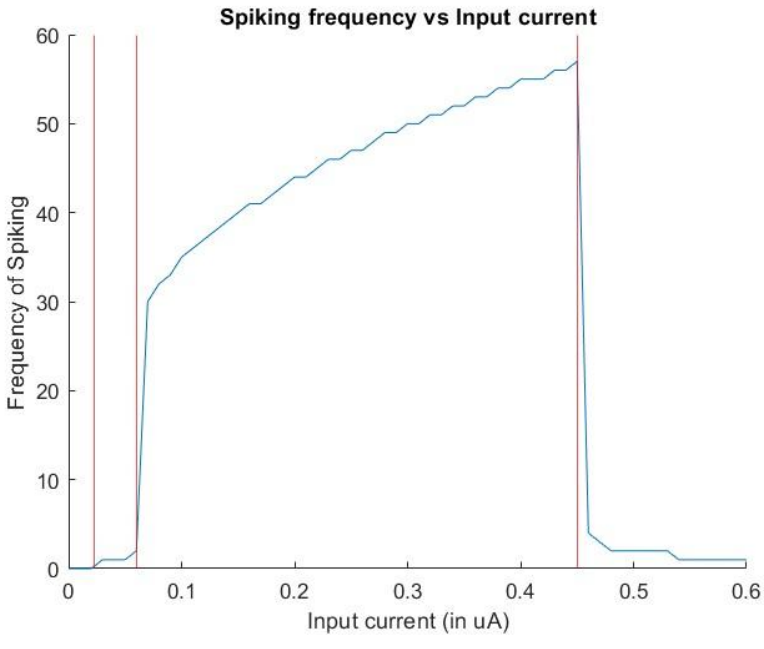
1. First, get approximate values of I1, I2, I3 from the modified code
2. Then, observing the plots around these values using the original code for more precision

Assumptions

1. The threshold voltage above which a peak is considered to be an action potential spike is taken as 10 mV.
2. The variable 'niter' ie: Number of iterations is taken as 50,000 for a finer plot with more accurate values
3. The y-axis of the plot below is taken as Number of spikes occurring. Since all the values are for the same time duration, the y-axis will simply be scaled uniformly in the case of spiking frequency

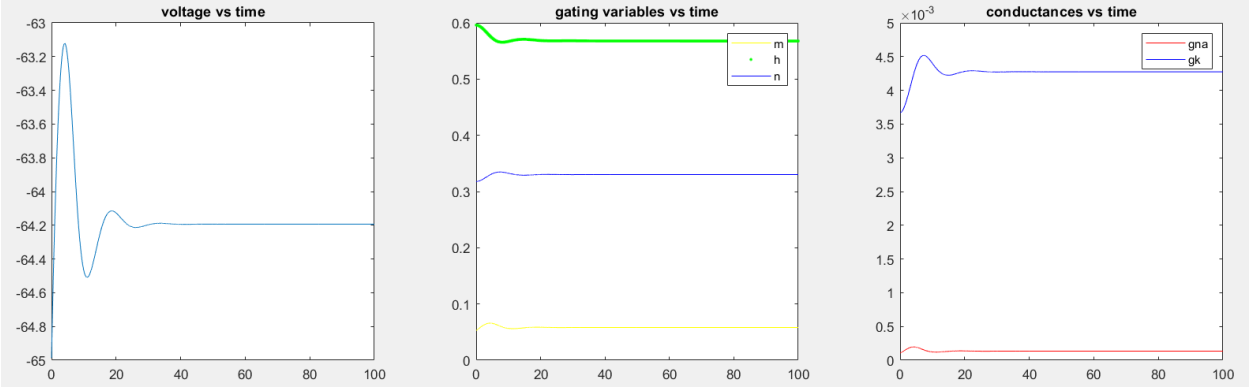
A2)

Spiking Frequency vs Input Current Plot:

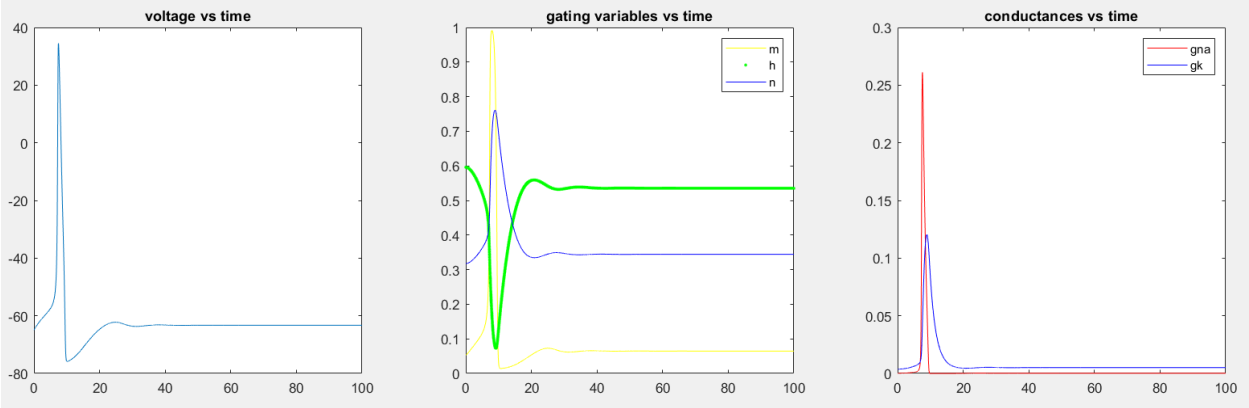


Plots (In all possible regions)

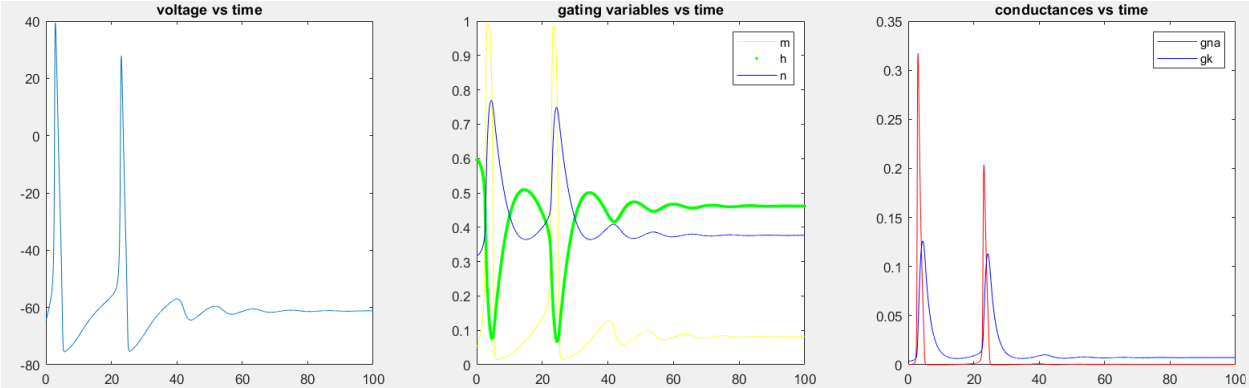
1. I_ext = 0.01A



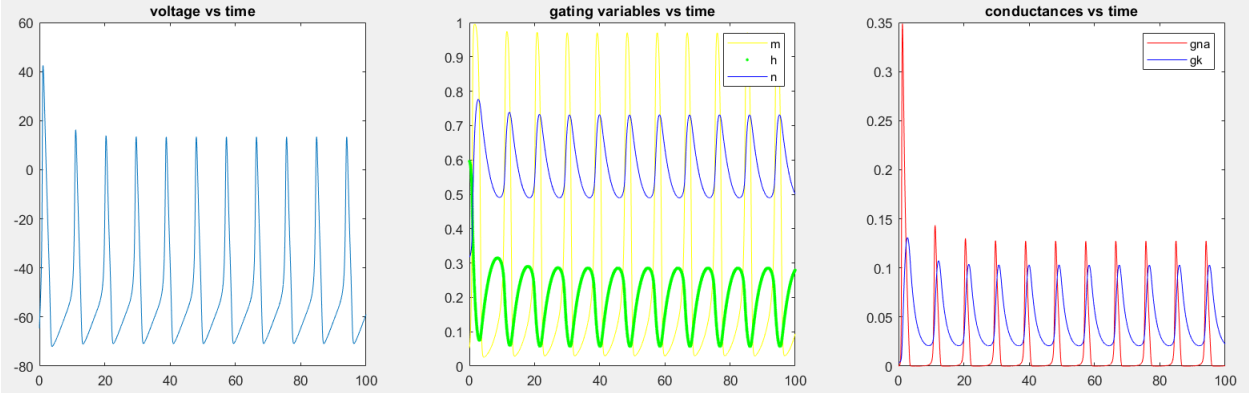
2. I_ext = 0.023A



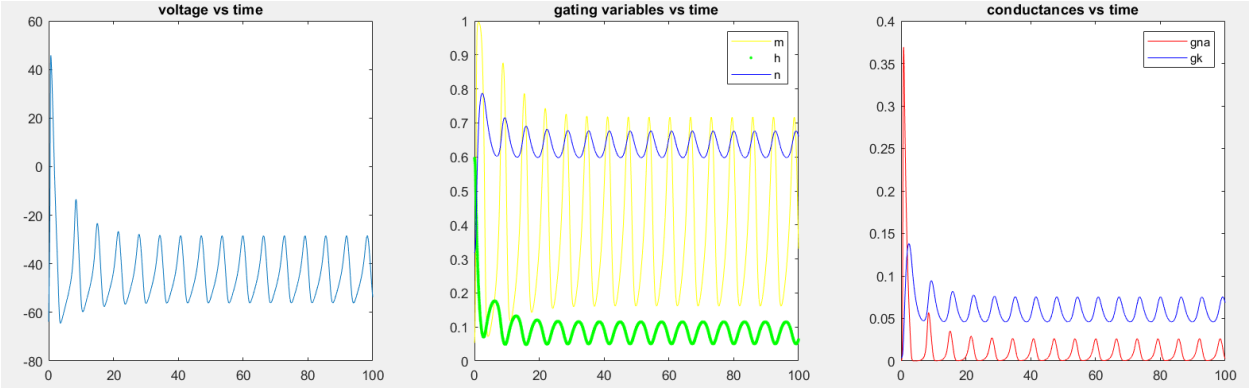
3. I_ext = 0.06A



4. I_ext = 0.4A



5. I_ext = 1.2A



6. I_ext = 2A