Coursework 3 - Integrate and Fire

Finn Hobson - `fh16413`

Question 1

Figure 1 shows the membrane potential of a neuron, spiking based on the leaky integrate-and-fire model. The firing rate is approximately 30Hz.

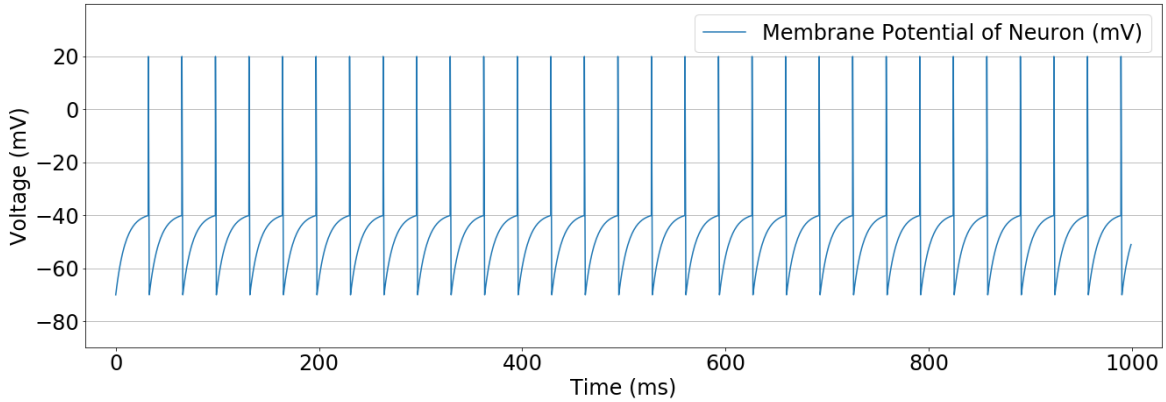

Figure 1

Question 2

Figure 2 shows the membrane potential of two neurons which have synaptic connections between each other. The synapses are excitatory so an action potential (spike) in the presynaptic neuron increases the probability of an action potential occurring in the postsynaptic neuron. Therefore, the spiking of the neurons becomes synchronised.

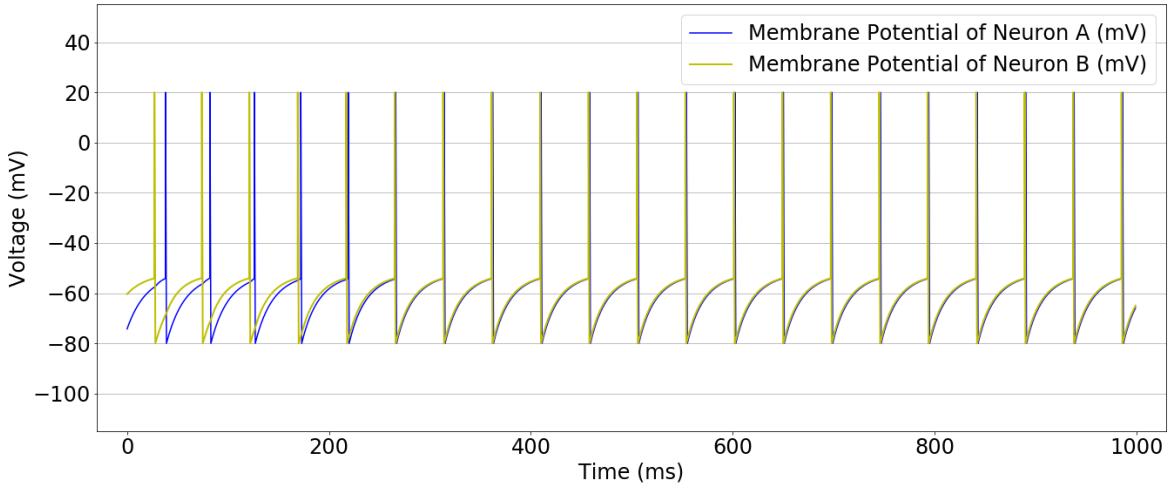

Figure 2

Figure 3 shows the membrane potential of two neurons which have synaptic connections between each other. The synapses are inhibitory so an action potential in the presynaptic neuron decreases the probability of an action potential occurring in the postsynaptic neuron. Therefore, the spiking of the neurons becomes out of sync.

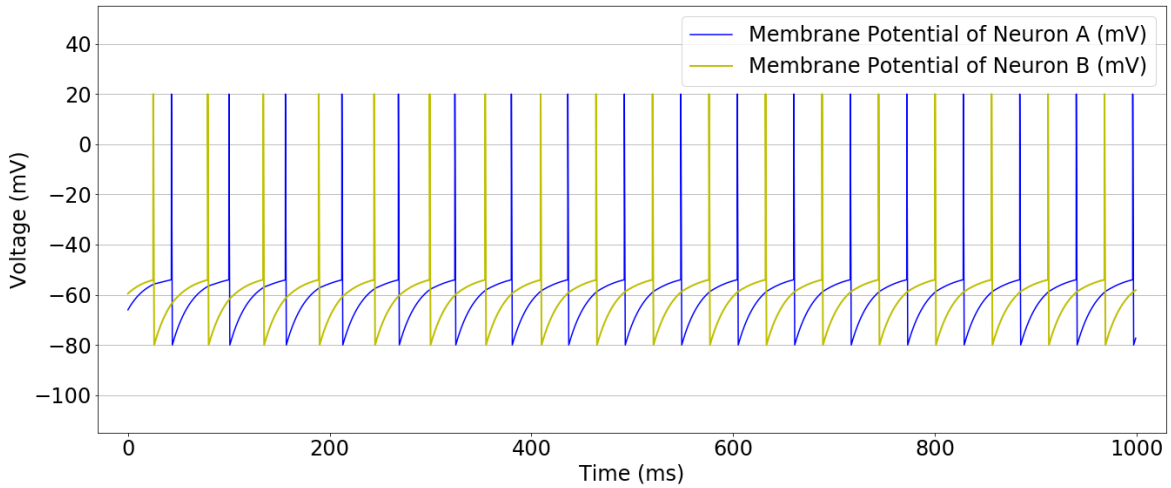

Figure 3