Lab # 3: Alexander Railton – 250848086

Problem #1:
As the excitatory potential ($v_e$) input increases the mean membrane potential is increasingly negative and as the inhibatory potential ($v_i$) increases the membrane potential becomes more positive. When the excitatory potential ($v_e$) reaches a certain level it overrides the inhibitory potential creating a more negative mean membrane potential. The standard deviations get increasingly small as the excitatory and inhibitory input rates increase. Along with the mean figure(1) we can see that as the membrane potential becomes increasingly negative with greater numbers of excitatory inputs the values of the standard deviation decrease giving a smaller range of values for the membrane potential.

Problem #2:
As the excitatory and inhibitory potential increases the membrane scaling leads to an increase of a negative potential. The increase in scaling of the excitatory to inhibitory potential will lead to more spikes per second until the potential reaches a peak and will decrease in the number of spikes per second as the ratio continues to grow. It eventually levels off as the scaling of ($v_e$) and ($v_i$) where the spikes per second level off. The membrane potential increases until a level that it peaks at which point the increase in negative potential of the scaling leads to a decrease in spikes per second and levels off as the scaling of the potentials as the membrane potential can no longer lead to more spikes per second.