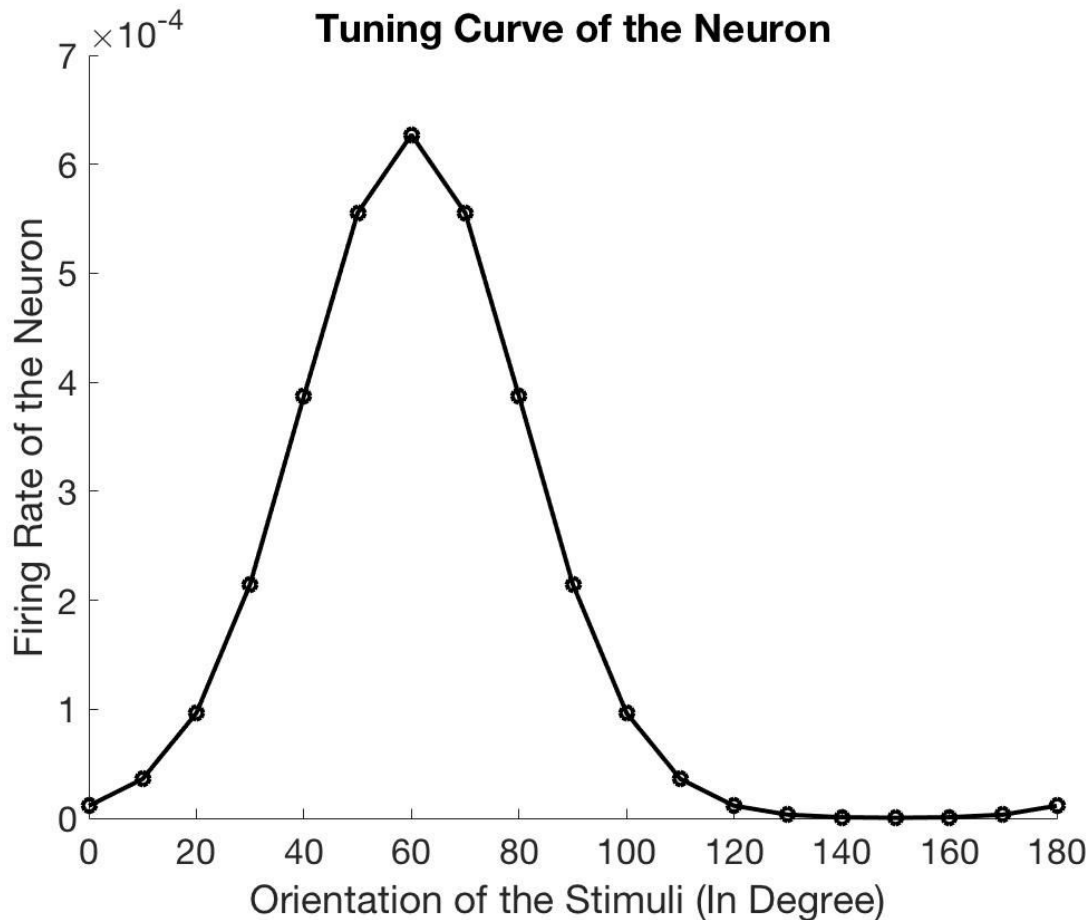


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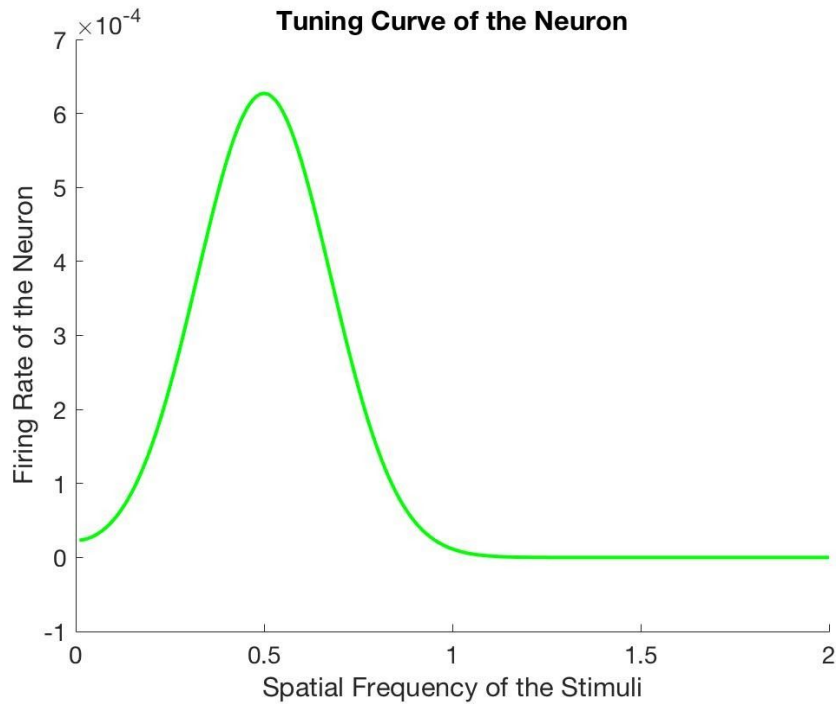
## Homework 2

b).



c). This graph makes sense to me. Since our V1 neuron has a preferred orientation of 60 degree, therefore its response is highest when the orientation of the stimuli (Gabor Image) has the same 60 degree. And the bell shape also corresponds to the neuron's response to other values, which is declining as the orientation of the stimuli departs from the preferred orientation.

d). Because the orientation of the stimuli will repeat all the values from  $0^\circ$  to  $180^\circ$ . For example, in cosine function,  $\cos(60^\circ)$  will essentially have the same value as  $\cos(300^\circ)$ , therefore the orientation of the Gabor image will be the same. It is not necessary to repeat all these orientations again.



e).

f). This graph also makes sense. The neuron will have the highest firing rate at a spatial frequency of 0.5, when the Gabor filter overlaps exactly with the Gabor image. And through changing the spatial frequency, the cell's response will decline further away from the desired spatial frequency.

g). Extra credit

