Computational Physics HW7

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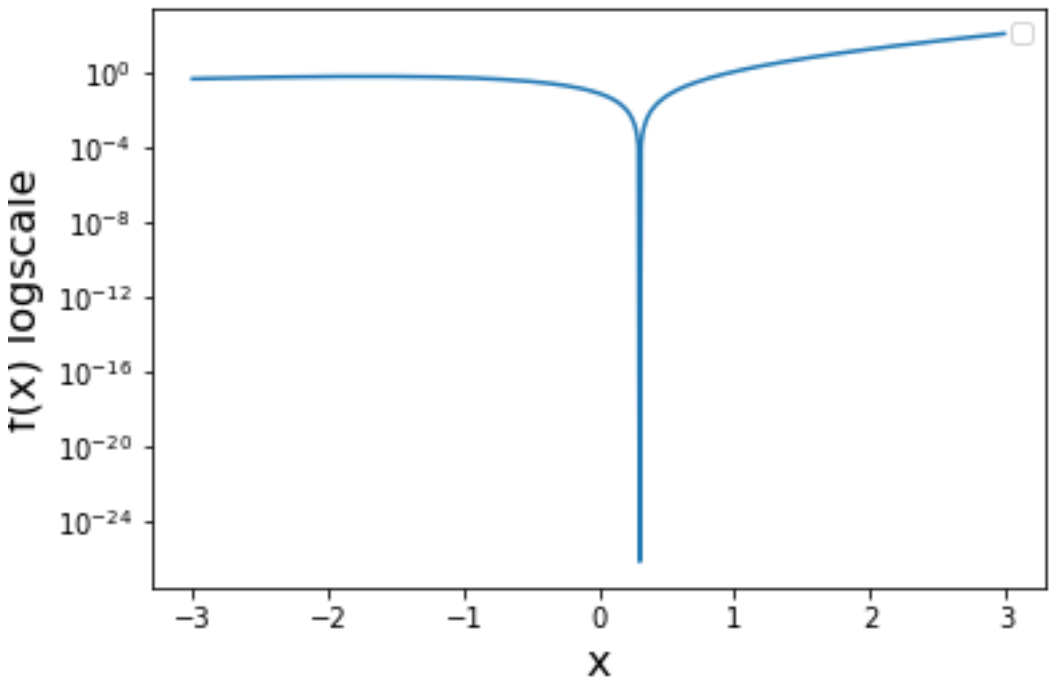

Figure 1: **P1: Plot of f(x) in log-scale on y-axis** To start our computation, we need to have an initial bracket that includes the extrema we want. We always want to plot the original function first. Looking at the plot, we can tell that the minimum is in [0,1], at least locally between -3 and 3. We then choose the initial bracket to be points (0,0.5,1). We get *Brent's: 0.3000000008740261* by Brent's method we implemented and *Scipy: 0.3000000000124971* by the build-in function of Scipy. They are pretty close and agree with the plot.

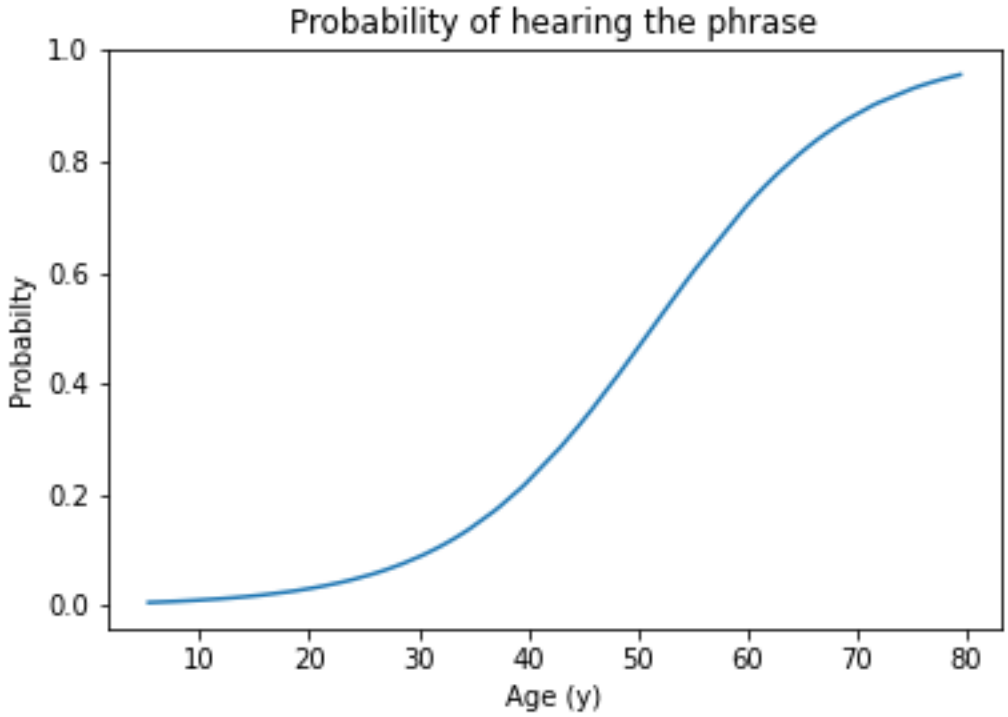

Figure 2: **P2: Probability by fitting the logistic regression to data** We start with some initial beta values and use minimization method to find the beta that maximize the log likelihood of the data. We use the parameter beta from minimization to get the logistic regression plot that fit to the probability of our data. This plot looks sensible as it agrees with our prediction that elder people are more probable of hearing the phrase.