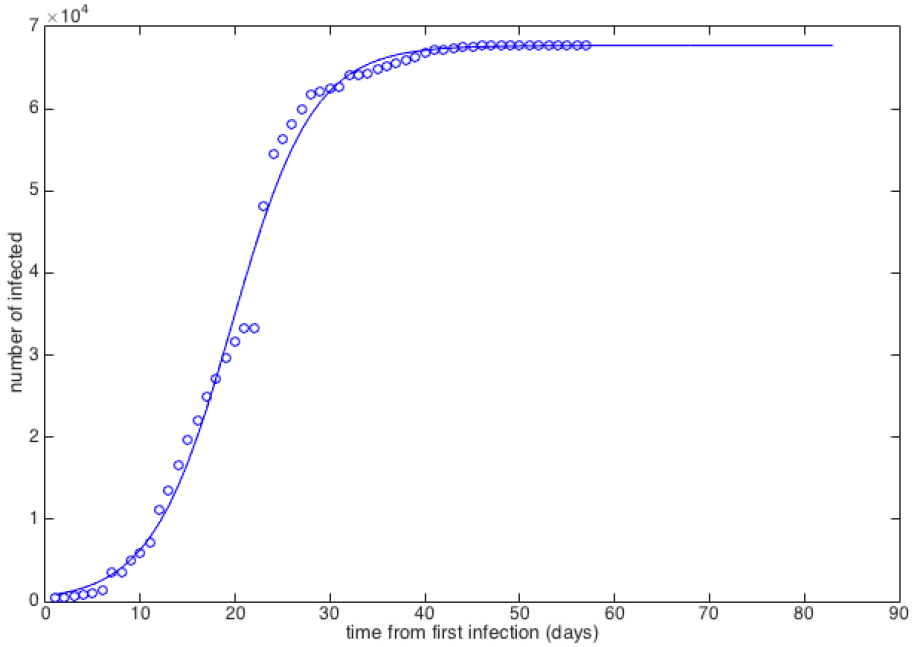
CS 136 Week 10 Quiz

Fitting a Logistic Model for Covid-19 Infection in the Provinces of China

Data: Daily (cumulative) number of Covid19 infection

1. Describe the logistic model $\frac{dy}{dt} = ky(C - y)$ for disease transmission and show that its solution can be written in the form $y(t) = \frac{A}{1+\exp\left(-\frac{t-\mu}{\sigma}\right)}$ where the parameters *A*, μ, $1/\sigma$ are the maximum number of infected, time of half the maximum infection, and infection rate respectively. For this reason, we can perform curve fitting with Covid19 data from places that resemble the logistic growth curve. (2 pts)

2. Fit the logistic equation to the infection data from Hubei province of China. You should get something like the following plot. (5 pts)



3. Perform the same with the Guangdong, Henan, and Hunan provinces of China and compare the infection rates in those provinces. (3 pts)