1 Assumption

motality: 3% infection period: 10days the rate of healthy person: 30%

Everyday a person meet f=(10) people in close 5hours in a day.Infection rate is 2%/h. Total population N is constant including the deceased.

2 Model

I made a this mathematical model of COVID-19.

$$\frac{dS}{dt} = -I * a * f \frac{S}{S + aI} * b * \frac{S + aI}{N} \tag{1}$$

$$\frac{dI}{dt} = I * a * f \frac{S}{S + aI} * b * \frac{S + aI}{N} - I(t - D) \tag{2}$$

$$\frac{dR}{dt} = I(t - D) \tag{3}$$

S:susceptible
I:infectious
R:removed
a:The infectious rate = 10%/day
f:close contact person = 10
b:the rate of asymptomatics(people without symptom)=30%
N:total population
D:infection period=10days

3 Result

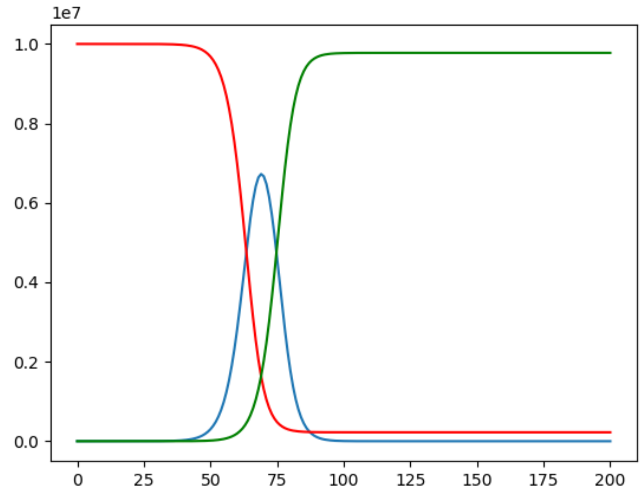

Figure 1: Susceptible Infectious Removed

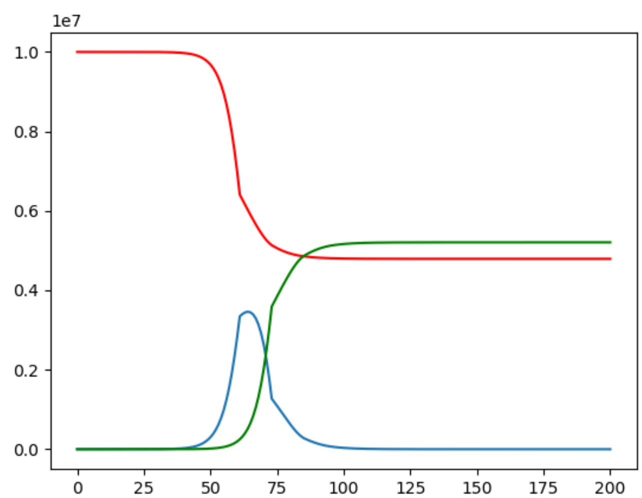

Figure 2: lockdown in 60days

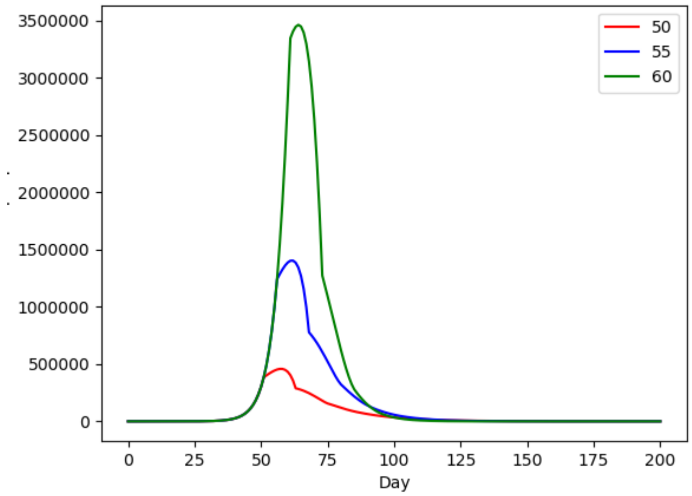

Figure 3: number of infectious (after lockdown)

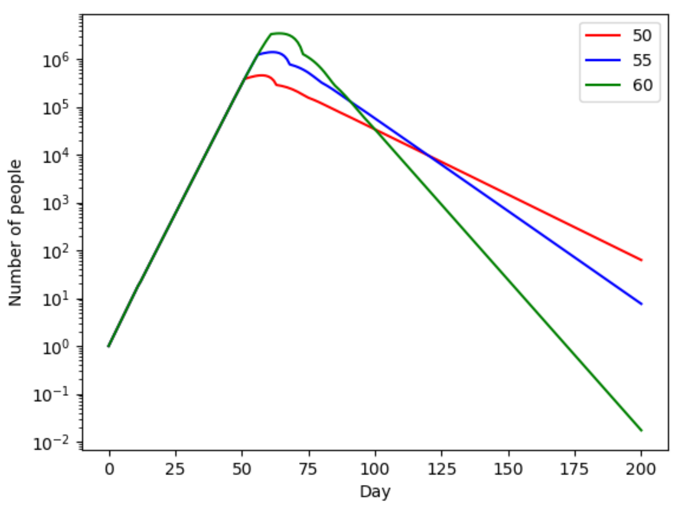

Figure 4: number of infecitous showed in logarithmic scale

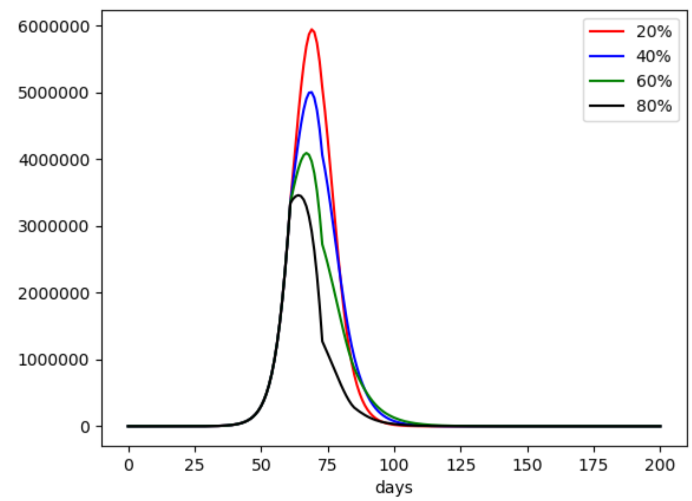

Figure 5: number of infectious with lockdown(20 80%)

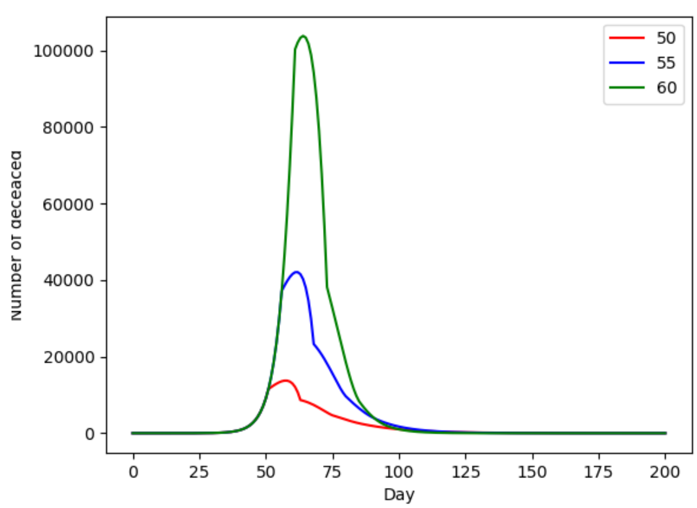

Figure 6: number of deceaced

4 Discussion

In this model,in figure1, 97.7%people is infected. It is too many infectious in comparision with reality, so this model cannot be an useful model for a real COVID-19 simulation.But the results showed in figure2,3,4 indicate locking down as soon as possible is very important for COVID-19(virus) measures.Concretely,in case of enforcing lock down after 60days, total infectious will be 52.0%, after 55days, these will be 25.2%, after 50days, these will be 9.9%.So only a 10days earlier measure bring about 42% decrease.