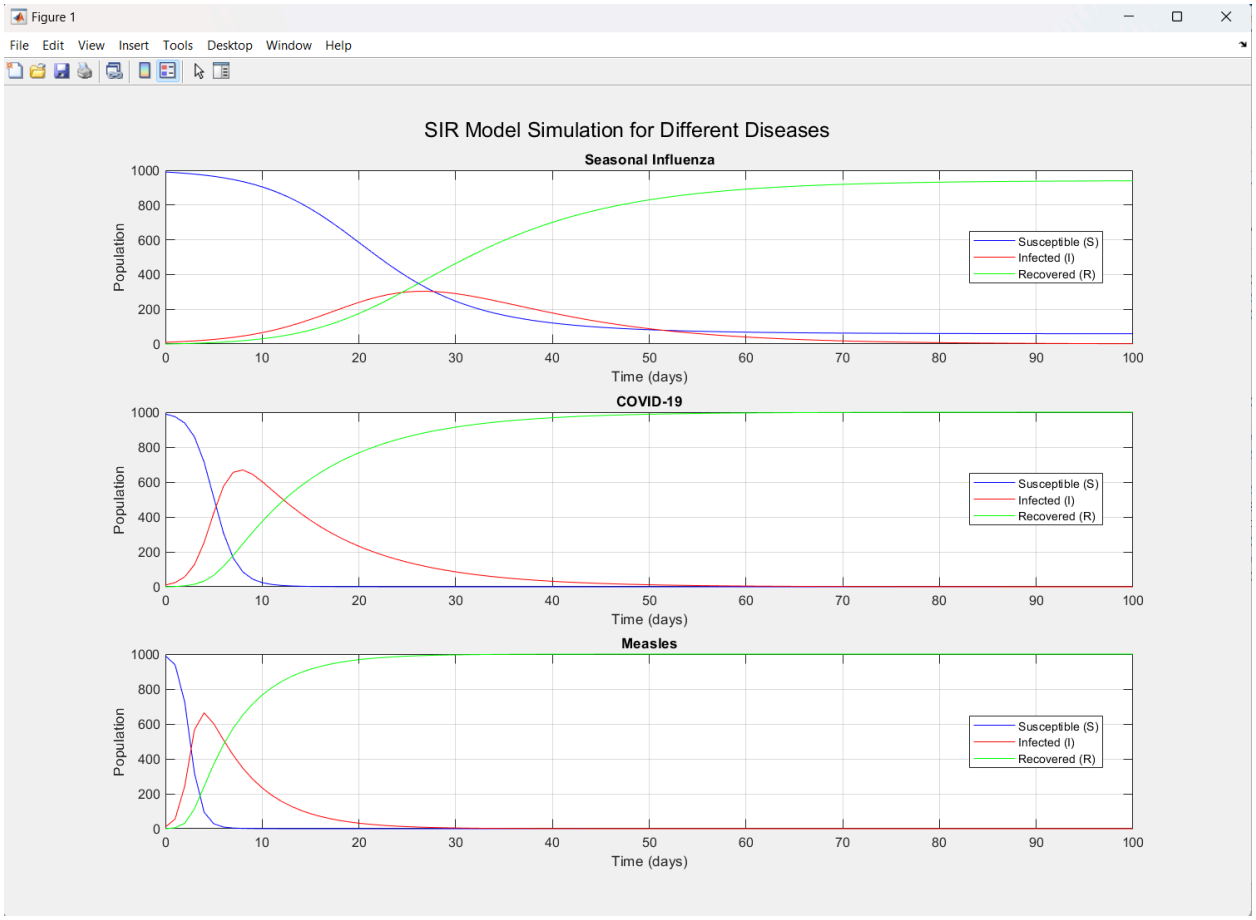

The values of β, the transmission rate, and γ , the recovery rate, significantly influence the dynamics of disease spread in the SIR model. Higher values of β lead to a faster, more intense outbreak, as seen with measles, where rapid transmission will cause a sharp peak in infections. Contrarily, lower value of β, seen in seasonal influenza, results in a slower spread and a prolonged epidemic. The recovery rate γ determines how quickly infected individuals recover; higher values of γ will shorten the outbreak duration, seen in measles, while lower values of γ, seen in COVID-19, will prolong the epidemic. The interplay between these parameters shapes the curves of S(t), I(t), and R(t), demonstrating that diseases with high values of β and low values of γ result in severe and long-lasting outbreaks, while higher values of γ mitigates the impact and resolves the disease more quickly. These results align intuitively with the patterns of real-world disease outbreaks.