Name: Udandarao Sai Sandeep

Roll Number: 180123063

Dept.: Mathematics and Computing
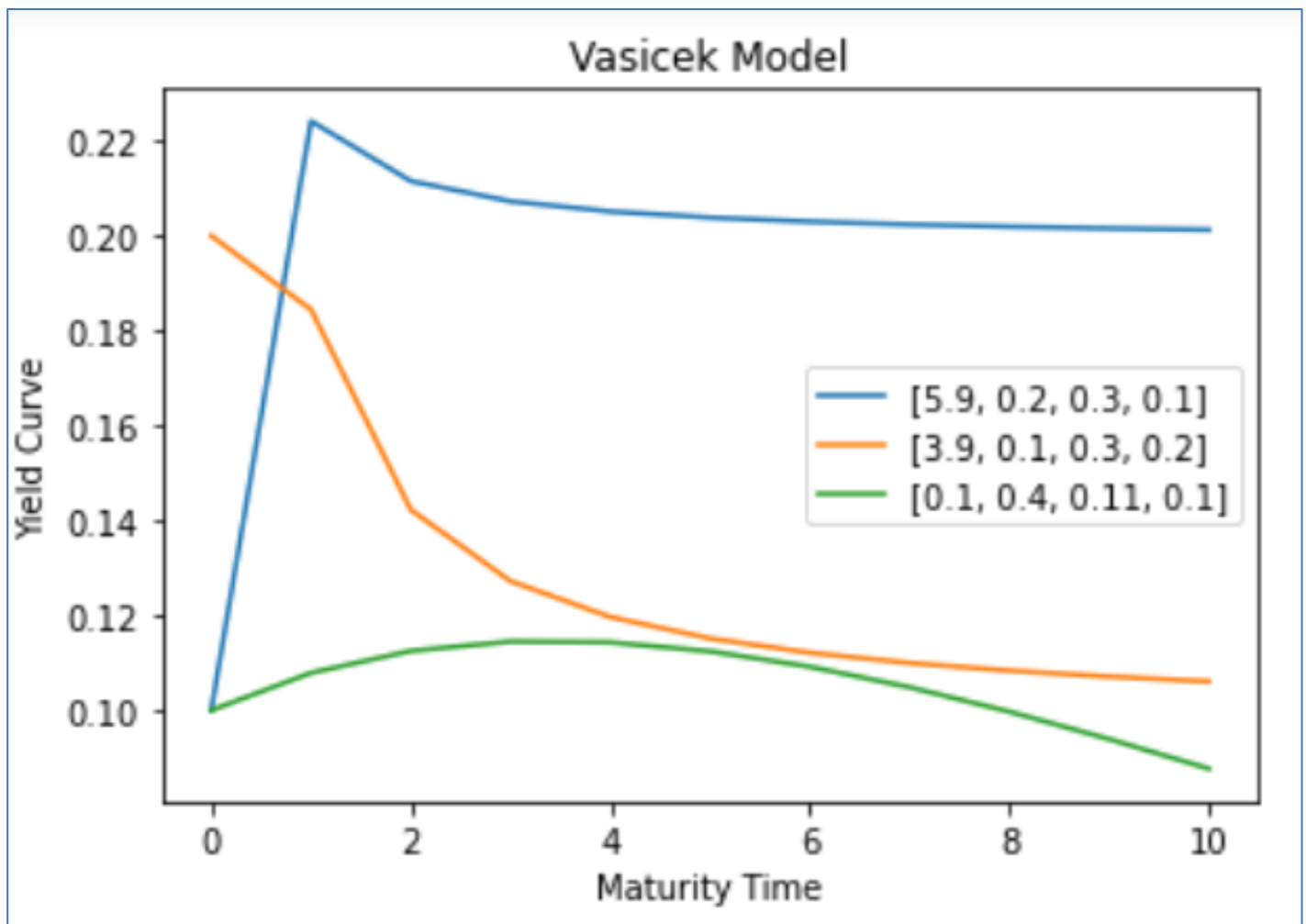
Q1.

The **Vasicek model** is as follows:

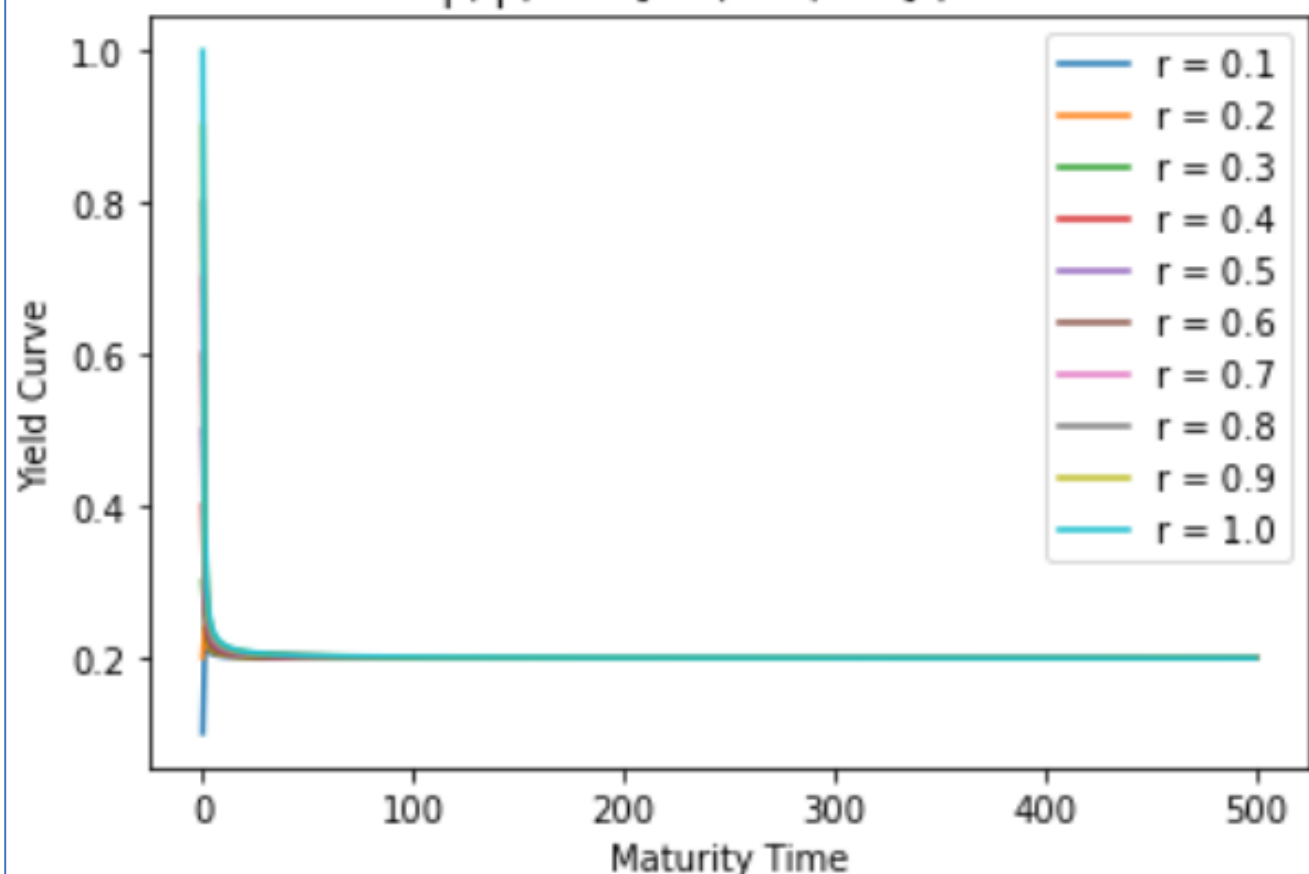$$dr = \beta(\mu - r)dt + \sigma dW^Q$$

Plot Yield vs Maturity Time for **3 parameter sets [5.9,0.2,0.3,0.1], [3.9,0.1,0.3,0.2]**, and **[0.1,0.4,0.11,0.1]**:
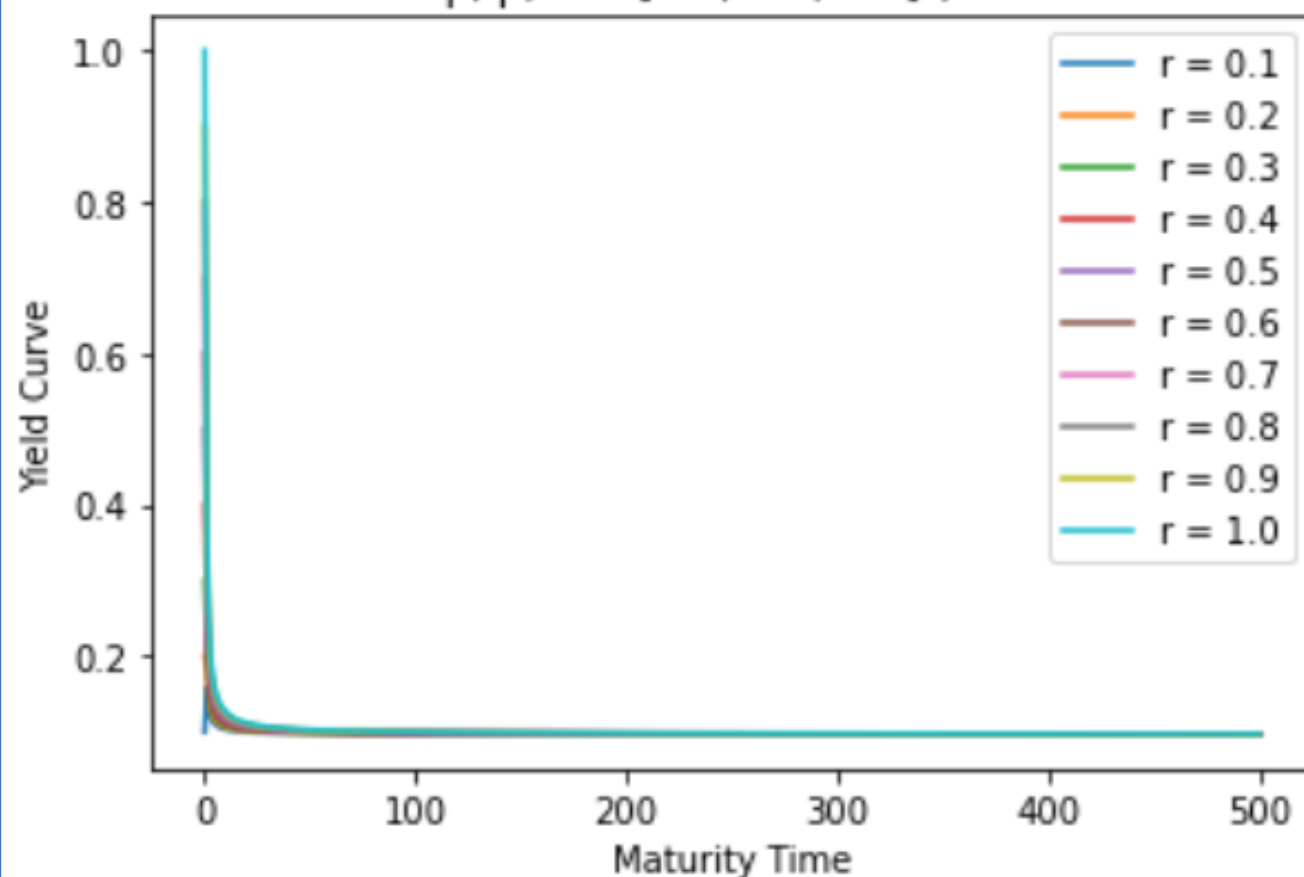
Term Structure:

Now, **10 different values of r (from 0.1 to 1)** were chosen. Then, the **Yield Curve vs Maturity Time** was plotted out for each of the parameter sets (with **500** units).
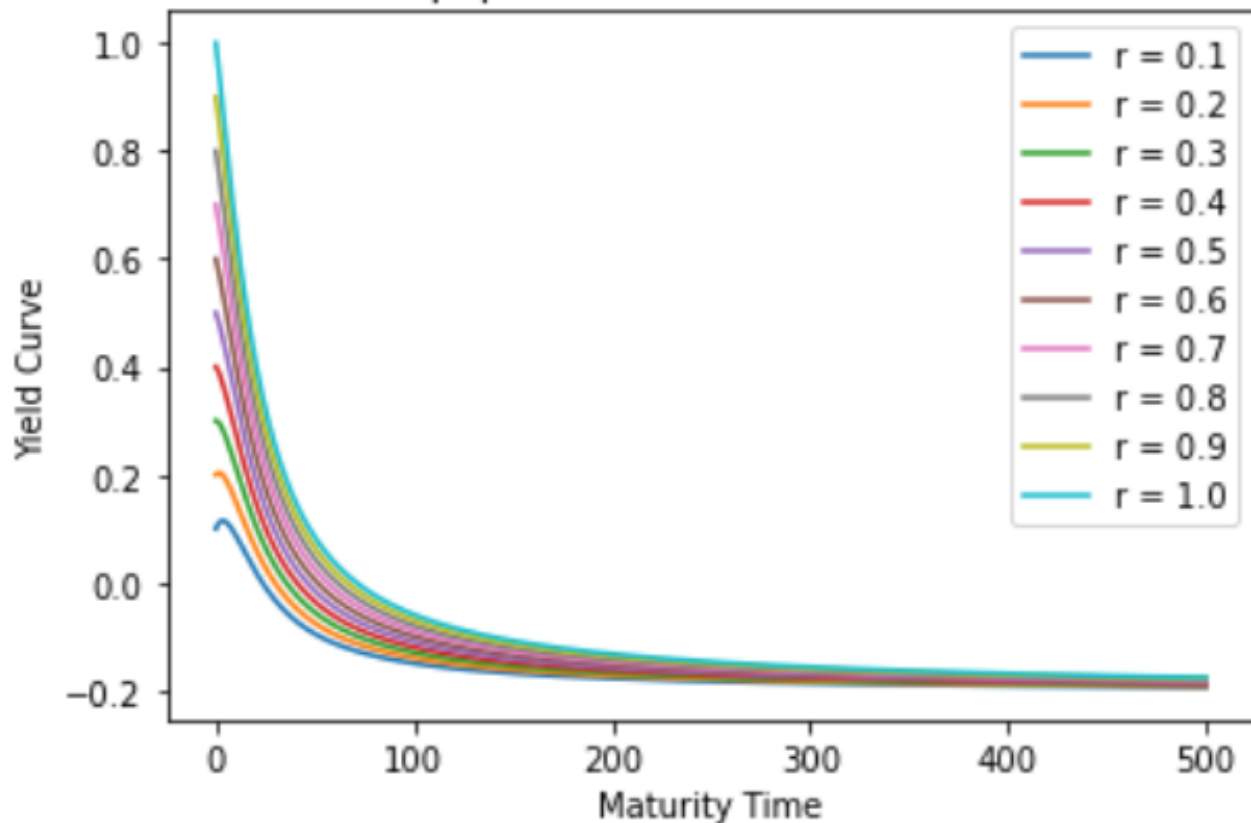
Vasicek Model with β, μ, σ = [5.9, 0.2, 0.3] (10 diffirent values of r)

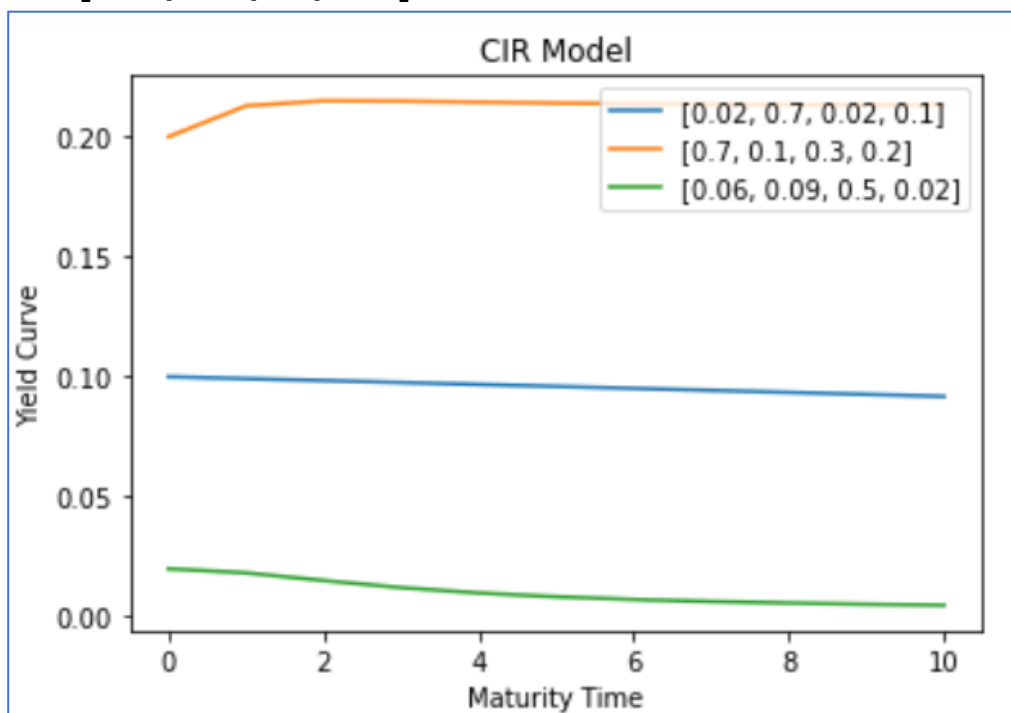Vasicek Model with β, μ, σ = [3.9, 0.1, 0.3] (10 diffirent values of r)

Vasicek Model with β, μ, σ = [0.1, 0.4, 0.11] (10 diffirent values of r)

Q2. The <u>CIR Model</u> is as follows:

$$dr = \beta(\mu - r)dt + \sigma\sqrt{r}dW^Q$$

Plot Yield vs Maturity Time for 3 parameter sets **[0.02,0.7,0.02,0.1], [0.7,0.1,0.3,0.2],** and **[0.06,0.09,0.5,0.02]:**

CIR Model

Now, **10 different values** of **r (from 0.1 to 1)** were chosen. Then, the **Yield Curve vs Maturity Time** was plotted out for the parameter set **[0.02,0.7,0.02, r]** (with **600** units).

CIR Model with β, μ, σ = [0.02, 0.7, 0.02] r = 0.1 to 1