**MA-374 Lab-11**

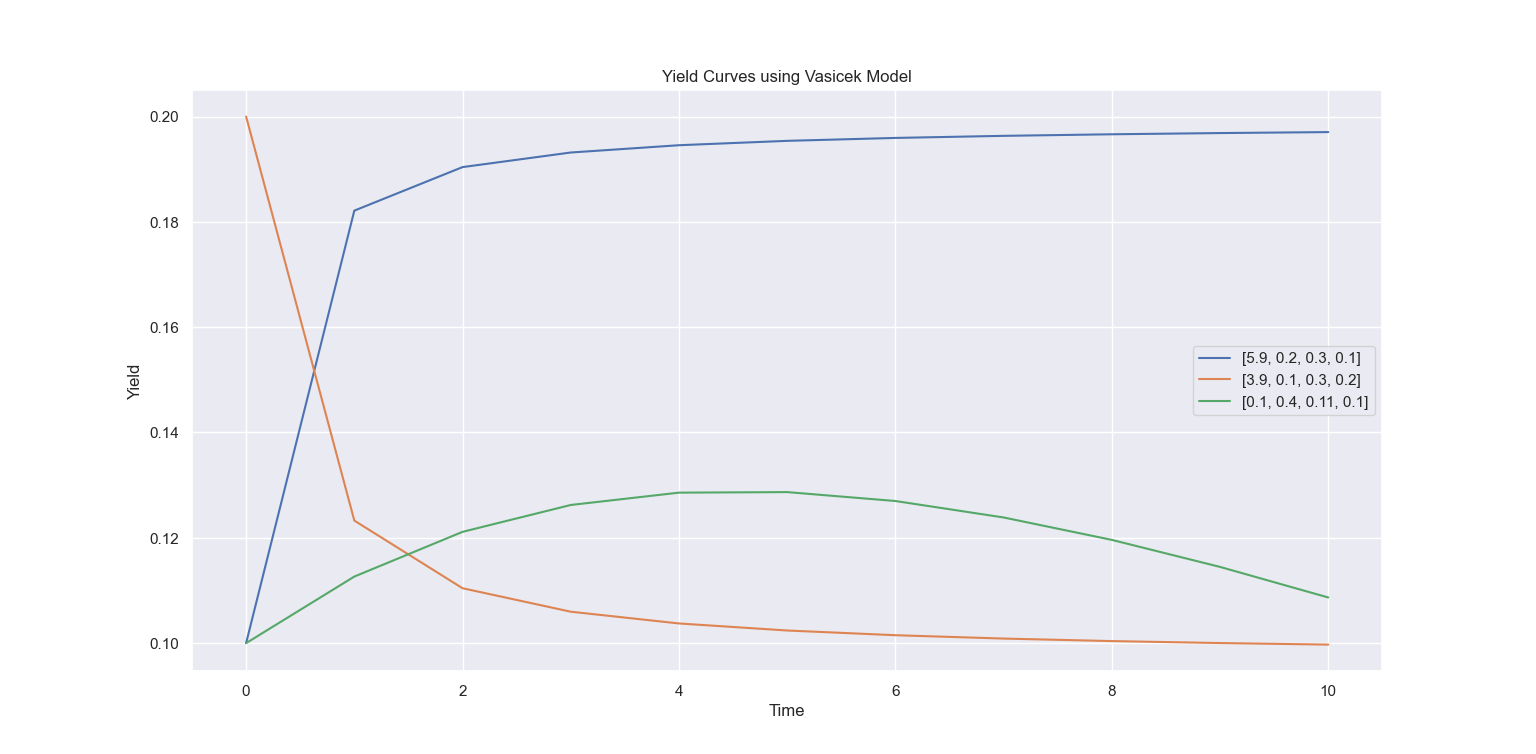
Name- Dev Sandip Shah

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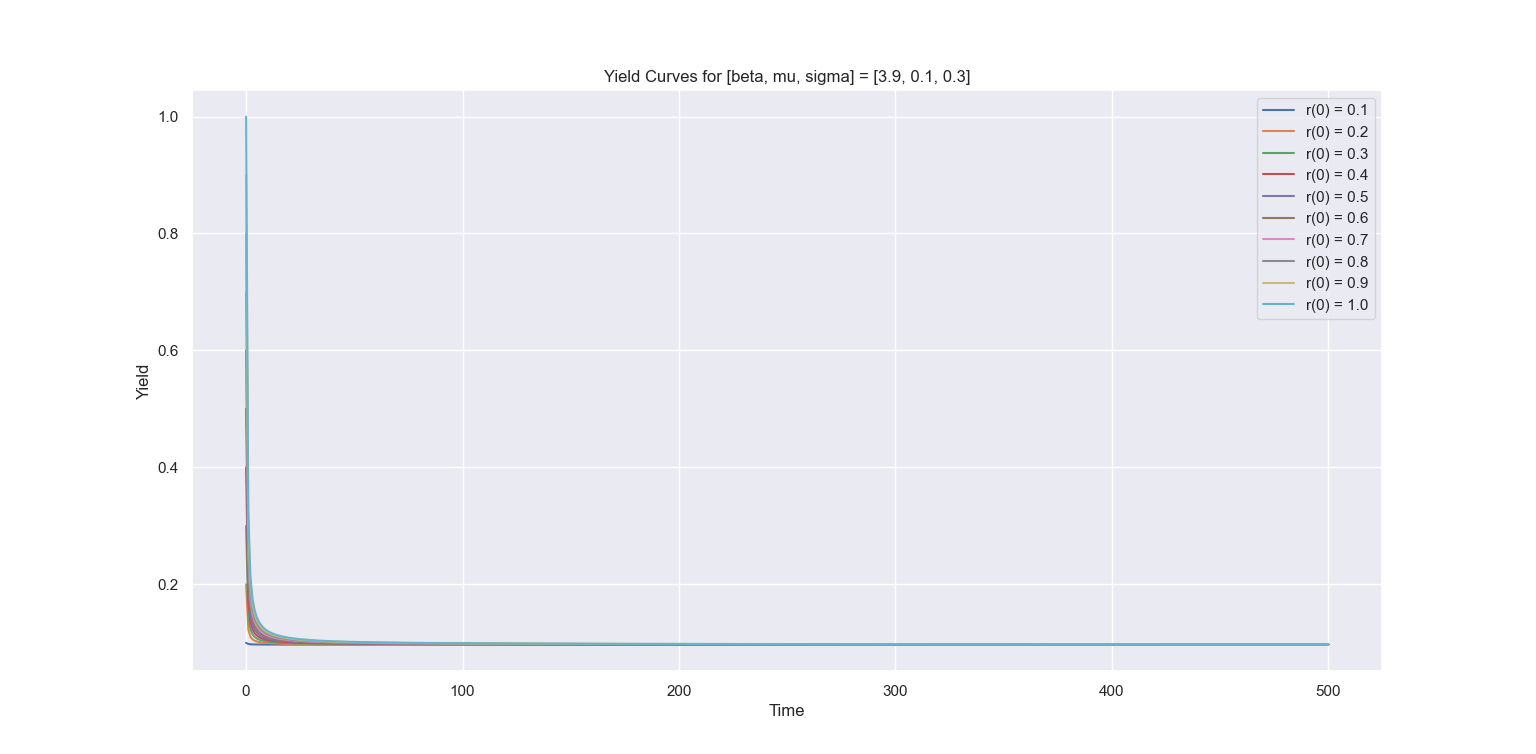
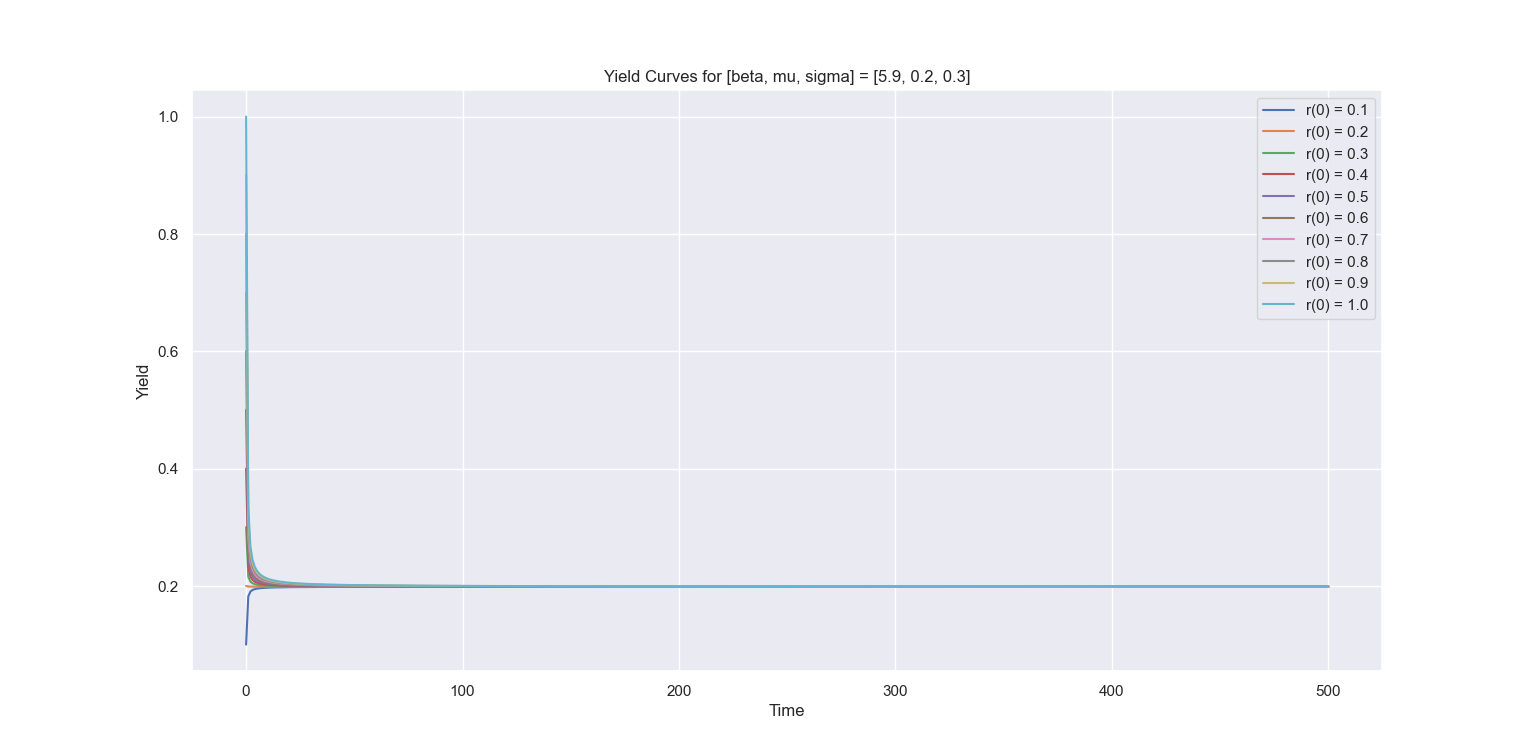
**Question 1:**

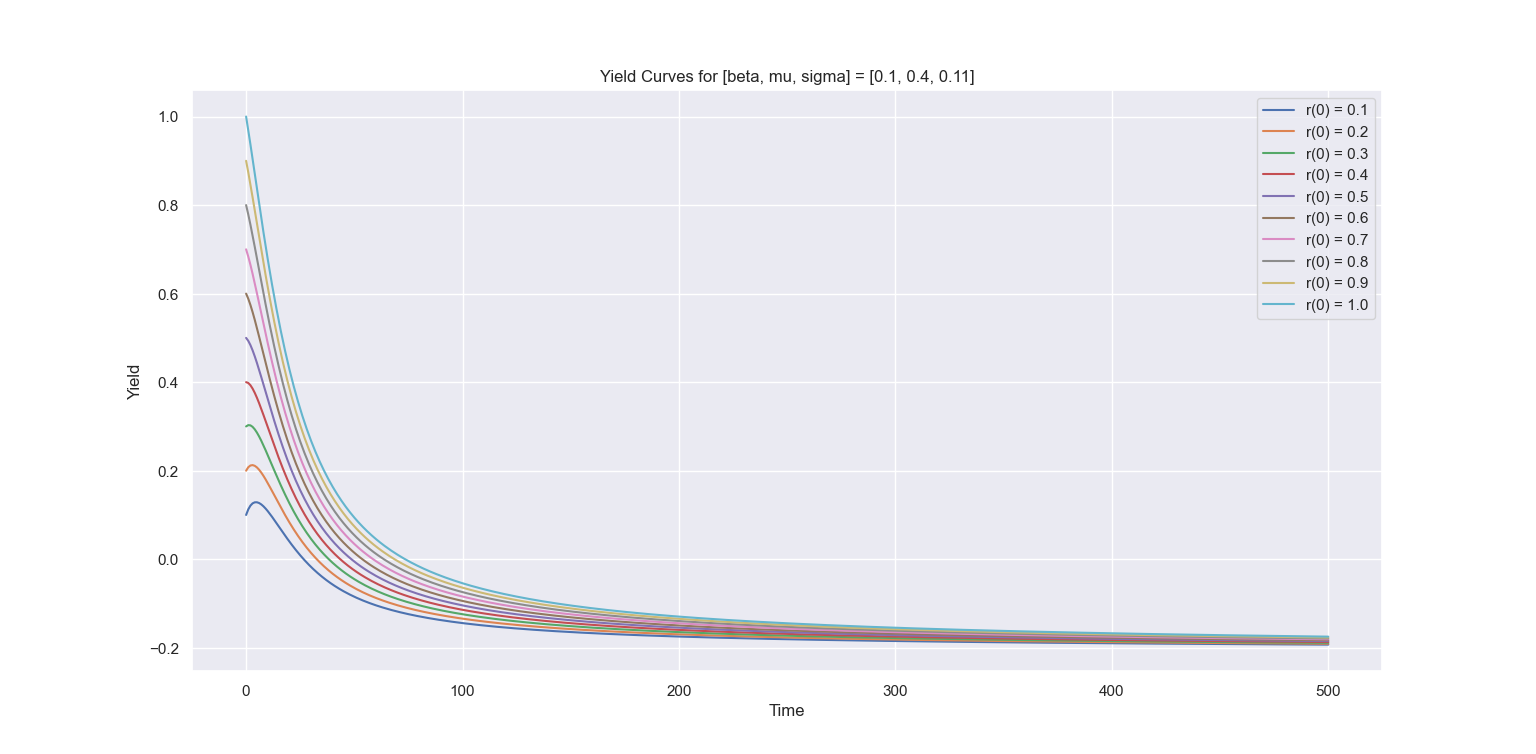
* In the Vasicek Model the risk neutral dynamics of r can be expressed as -
* On comparing with the model we get
* Price of the bond is calculated using following formulae -
* Yield can be calculated from the price using following formula–
* t = 0 in our case.

**Term structure for the given parameters is plotted using 10 time units.**

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**Now, yield curves versus maturity up to 500 time units for 10 different values of r(0) are plotted for all the three sets of parameters.**

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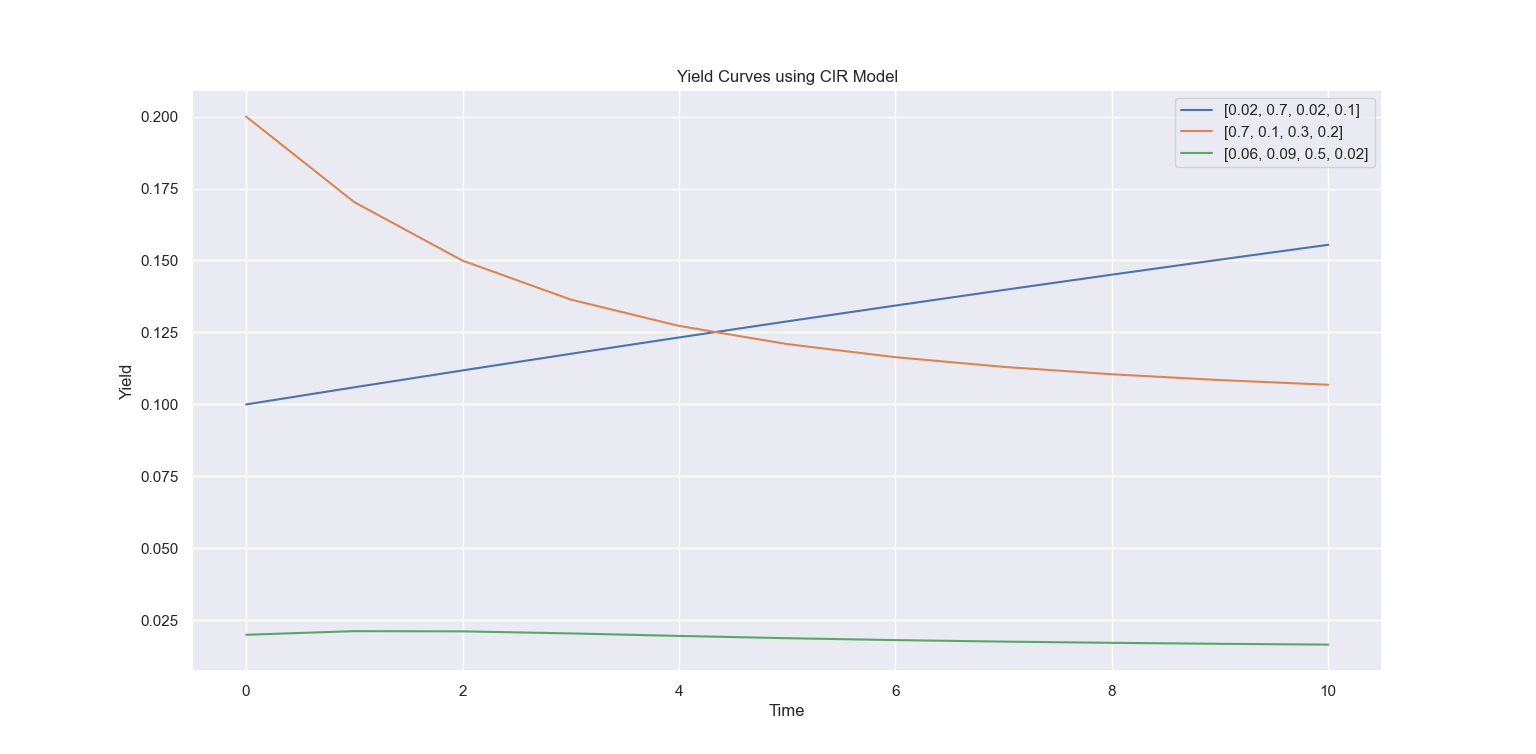
**Observations :**

* For higher r(0), yield is higher
* Yield converges to a limit for all the parameters.
* Yield can increase or decrease with time to maturity. It depends on the prediction made using the current parameters about the future interest rates.

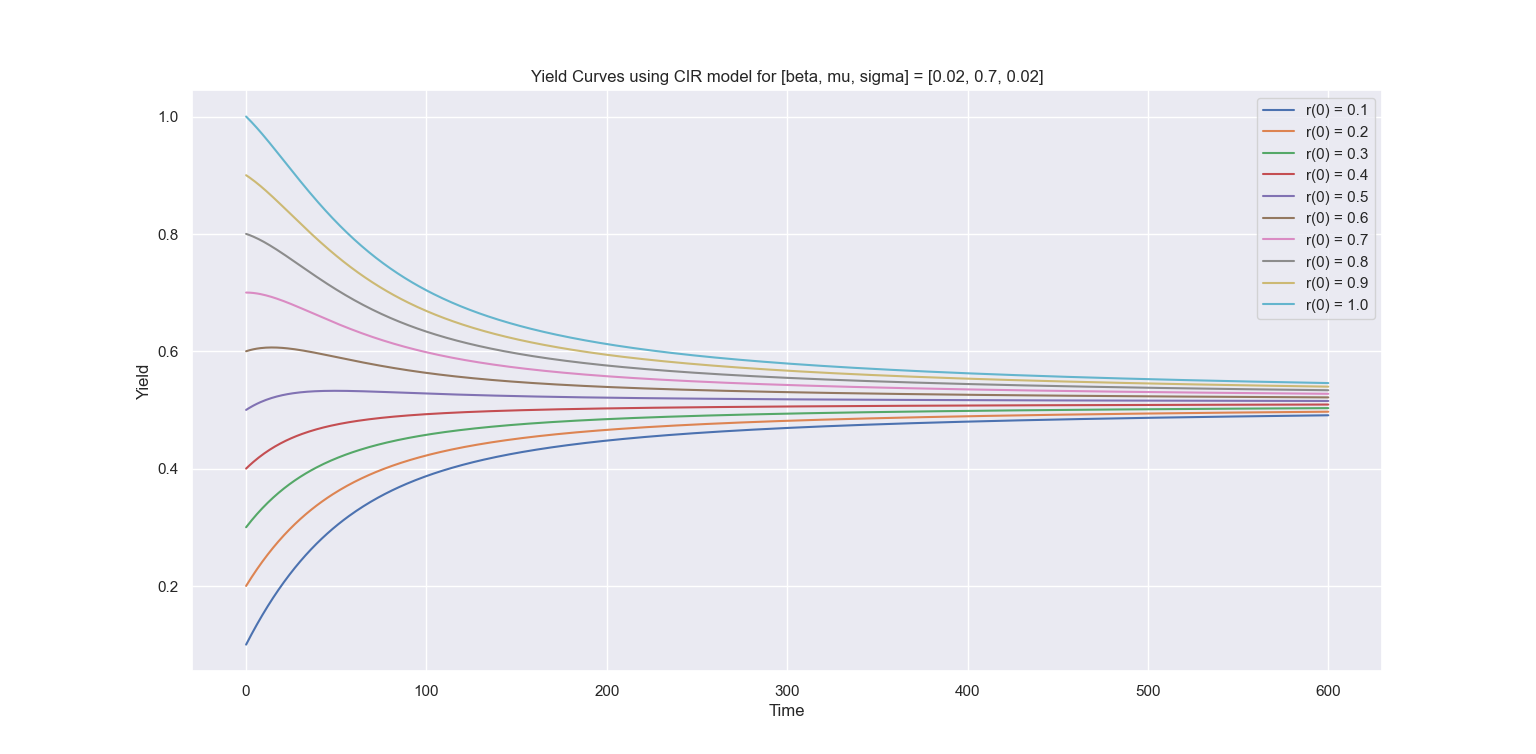
**Question 2:**

* In the CIR(Cox-Ingersoll-Ross) model the risk neutral dynamics of r can be expressed as –
* On comparing with the model we get a = β and b = μ.
* Price of the bond is calculated using following formulas –
* Yield can be calculated from the price using following formula –
* t = 0 in our case.

**Term structure for the given parameters is plotted using 10 time units.**

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**Now, yield curves versus maturity up to 600 time units for r(0) = 0.1:0.1:1 is plotted for [beta, mu, sigma] = [0.02, 0.7, 0.02].**



**Observations :**

* For higher r(0), yield is higher.
* Yield converges to a limit.
* Yield can increase or decrease with time to maturity. It depends on the prediction made using the current parameters about the future interest rates.