

Part-1

Theta 1 function:-

$$\ddot{\theta}_1 = \frac{(-g \sin \theta_1 - \eta L_2 \sin(\theta_1 - \theta_2) \dot{\theta}_2^2 + \eta L_2 \cos(\theta_1 - \theta_2) \ddot{\theta}_2)}{L_1}$$

$\theta_1 = u(1)$ $L_2 = u(4)$
 $\theta_2 = u(2)$ $L_1 = u(5)$ $\ddot{\theta} = u(7)$
 $\eta = u(3)$ $\dot{\theta}_2 = u(6)$

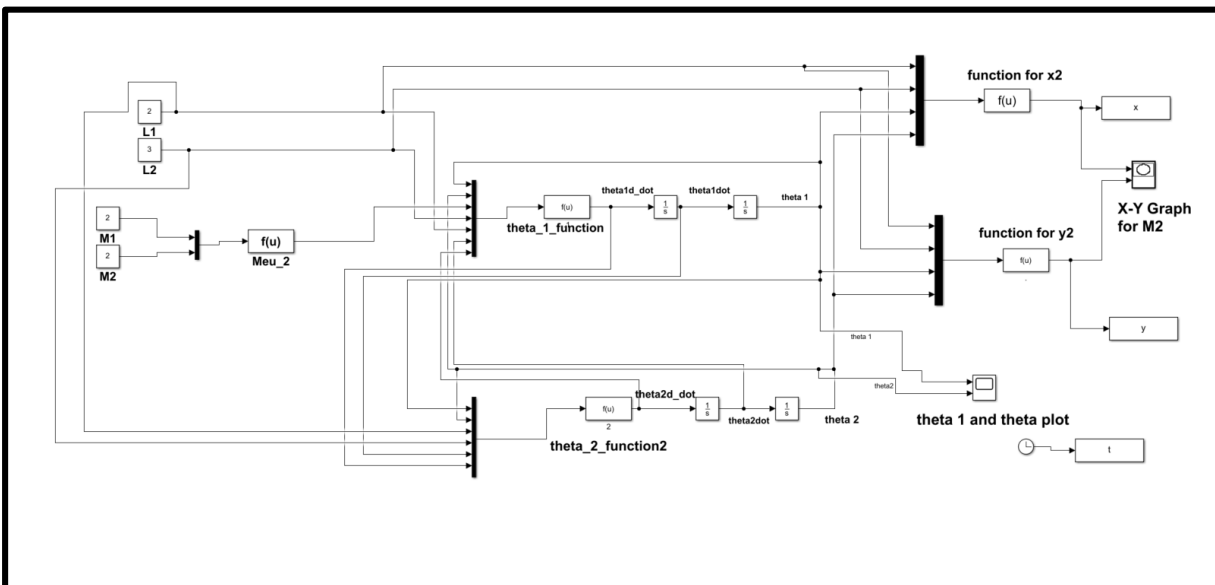
θ_1 function

Theta 2 - function:-

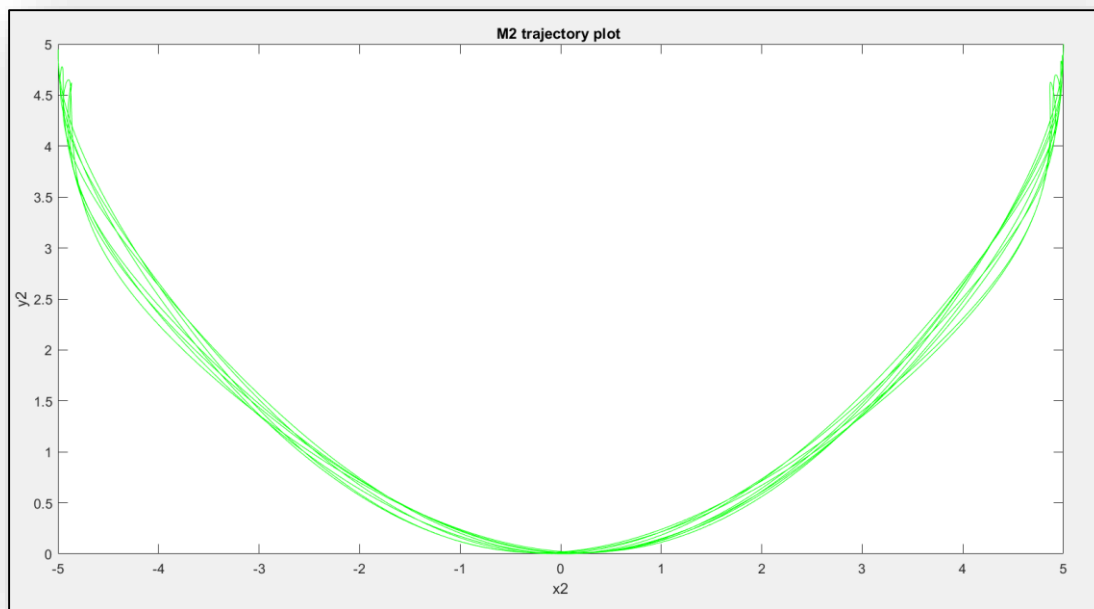
$$\ddot{\theta}_2 = \frac{-g \sin \theta_2 + L_1 \sin(\theta_1 - \theta_2) \dot{\theta}_1^2 - L_1 \cos(\theta_1 - \theta_2) \ddot{\theta}_1}{L_2}$$

$\theta_1 = u(1)$ $L_2 = u(4)$
 $\theta_2 = u(2)$ $\dot{\theta}_1 = u(5)$
 $L_1 = u(3)$ $\ddot{\theta}_1 = u(6)$

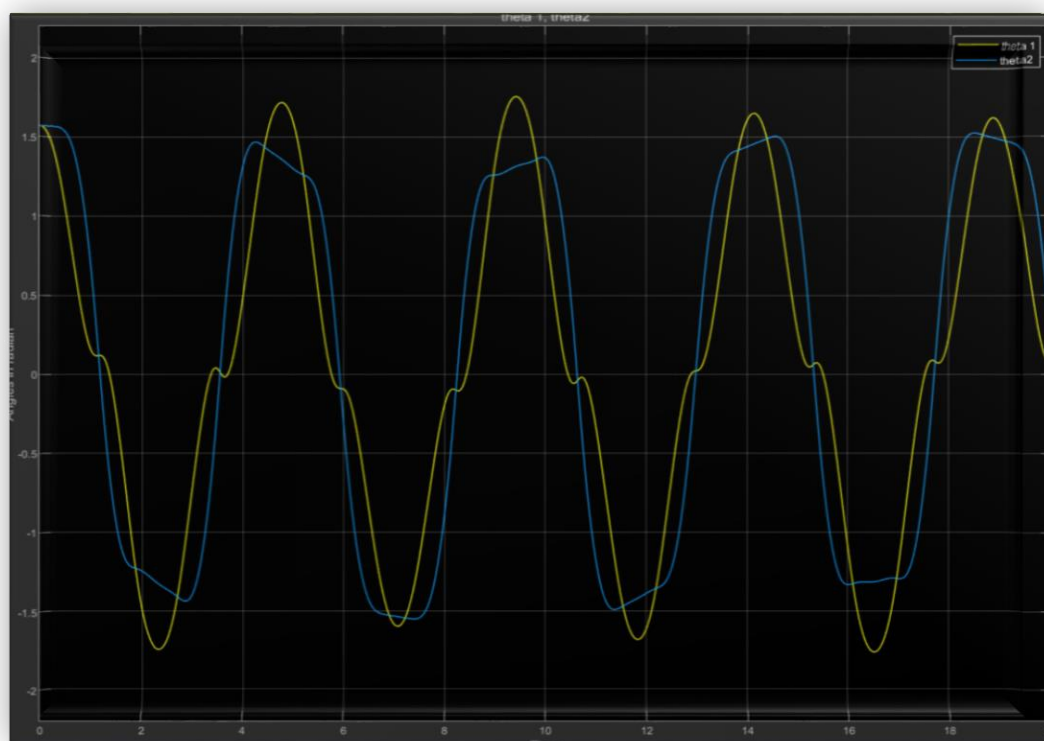
θ_2 function



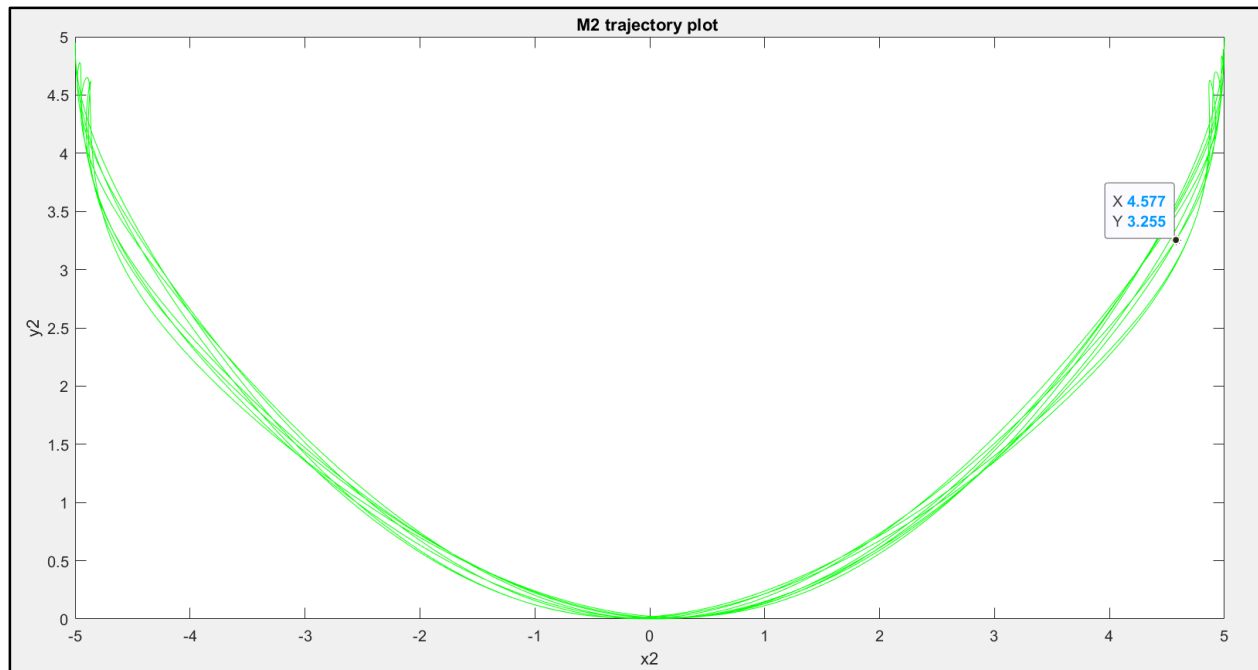
Simulink design



Show **m2** trajectory plot (x_2, y_2) with time



θ_1 and θ_2 plots with time on one figure

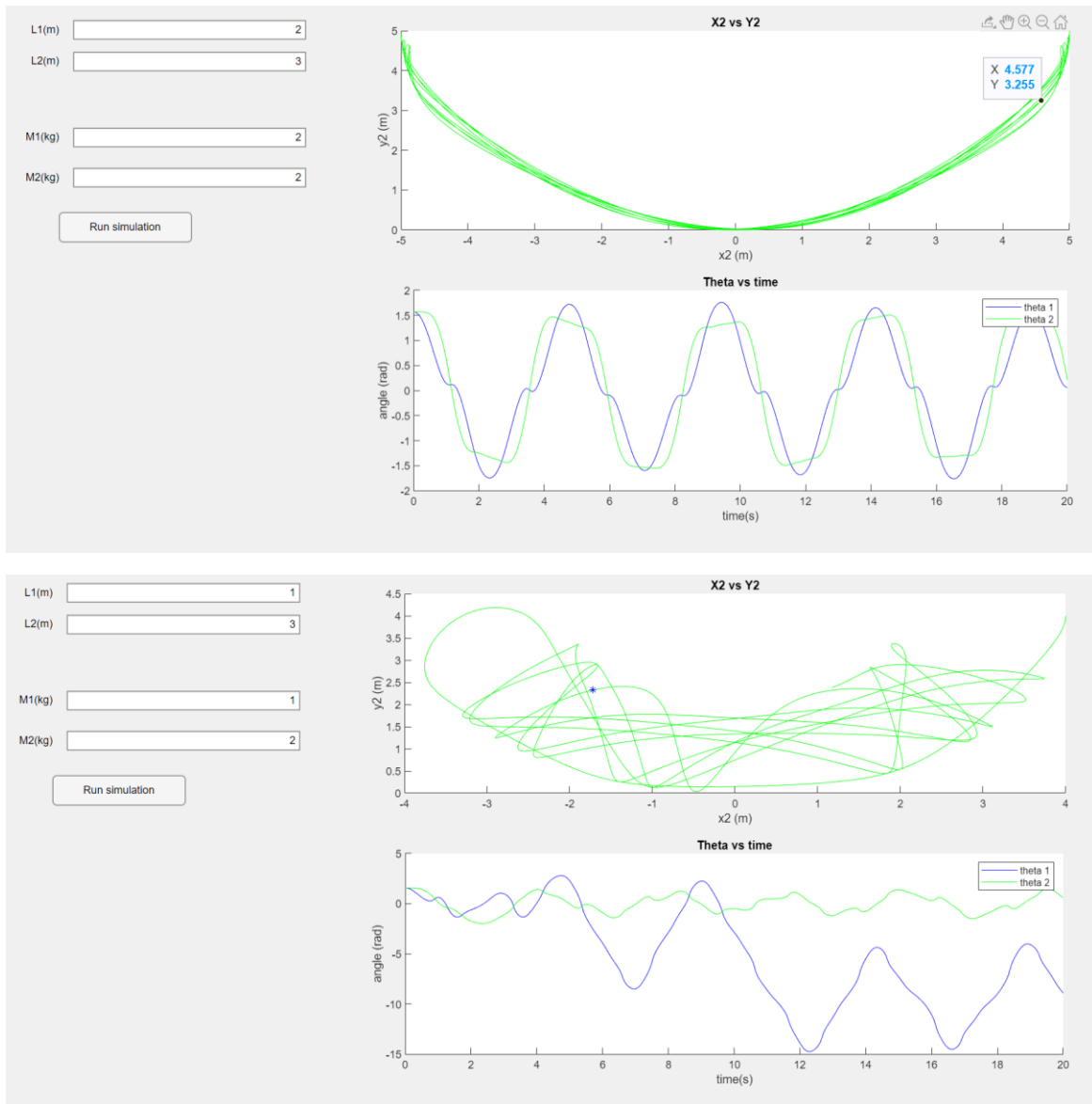


display **m2** location (X_2, Y_2) after 10 seconds

Read me:

1. Go to part 1 and open **model_part1** and **code_for_point_t_10**
2. Run **model_part1**
3. Get plot of trajectory of M2 from **XY graph for M2** in Simulink model
4. Get plot of θ_1 and θ_2 from **theta 1 and theta2 plot** in Simulink model
5. Run **code_for_point_t_10** to get the position of M2 after 10 sec

Part-2



Here is the app for trajectory of second mass.

The [star](#) show the position of **M2** after 10 second **x2 vs y2** plot.

Read me:

1. Go to part2 and open **app1.mlapp**
2. Run **app1.mlapp**
3. Enter the value of l_1 , l_2 m_1 and m_2
4. Run simulation