

Problem 1:

In the given [video](#), a red ball is thrown against a wall. Assuming that the trajectory of the ball follows the equation of a parabola:

1. Detect and plot the pixel coordinates of the center point of the ball in the video. **[10]**
(Hint: Read the video using OpenCV's inbuilt function. For each frame, filter the red channel)
2. Use Standard Least Squares to fit a curve to the extracted coordinates. For the estimated parabola you must,
 - a. Print the equation of the curve. **[5]**
 - b. Plot the data with your best fit curve. **[5]**
3. Assuming that the origin of the video is at the top-left of the frame as shown below, compute the x-coordinate of the ball's landing spot in pixels, if the y-coordinate of the landing spot is defined as 300 pixels greater than its first detected location. **[10]**

