Computer Vision
Assignment 3: Lane Detection
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Selecting white and yellow lanes by converting image to HSV:

In first step image is converted to HSV to select the yellow and white region of lanes and converting image into binary image. Important results in this step are:

- Accuracy of selecting yellow and white region increases if we applying separate thresholds for yellow and white regions.
- Areas other than lanes are also selected in this binary image but they are away from lanes.

Following are some samples images of this step. All detailed images are also reported in next section.
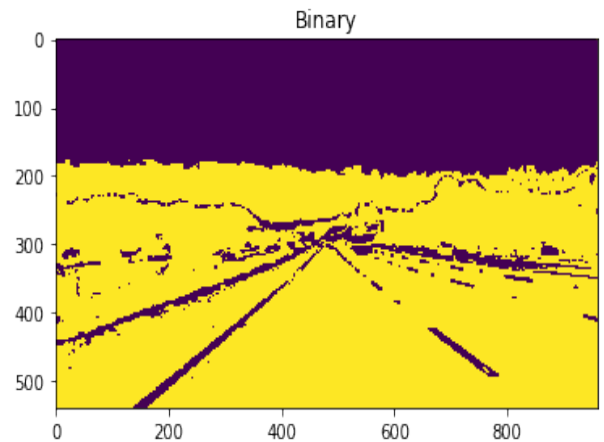
Canny Edge Detection:

Canny edge detection is used to detect the boundaries of the lanes.
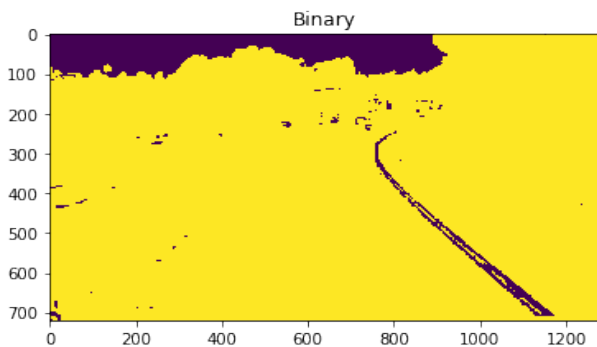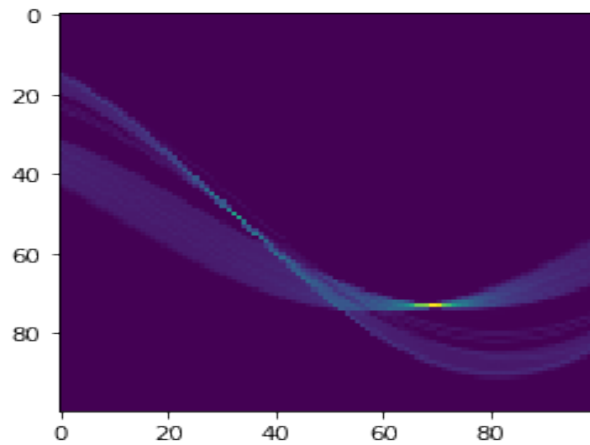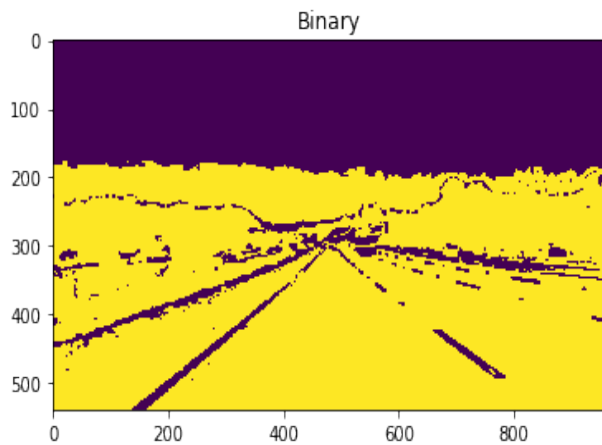Some results are
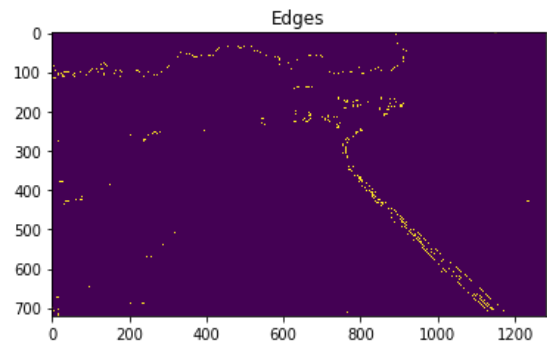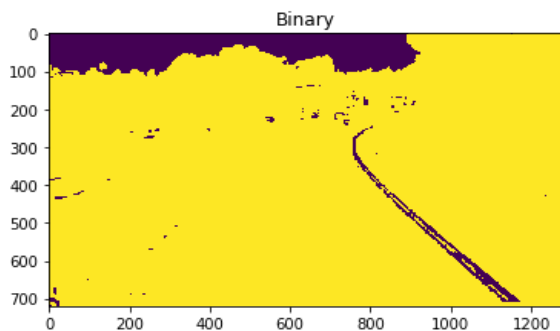
Hough Transform:

Hough Transform is implemented on the image we gwt in result of edge detection. Hough transform is implemented in the following steps:

- **Accumulator:**
  An array of arbitrary precision for angles and rhos is created and for each pixel votes are incremented.
 The Hough parameter space of some images are:
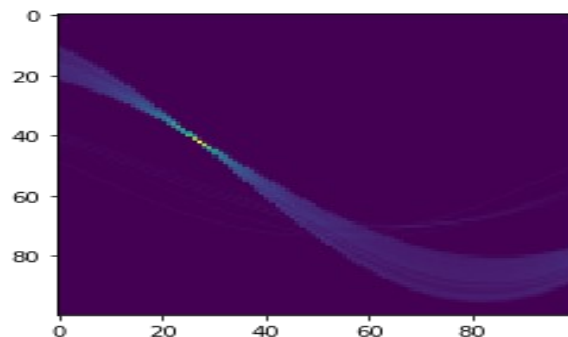
Processing of Hough Lines Thresholding :

In this step we perform following steps:
- Removing horizontal lines with slopes near zero
- Thresholding Accumulator to get the most voted lines
- Dividing lines into two left and right groups
- Accumulator returns polar parameters "theta" and "rho" for the lines these parameters are converted to Cartesian parameters slope and intercept.

Following are some results of this step:
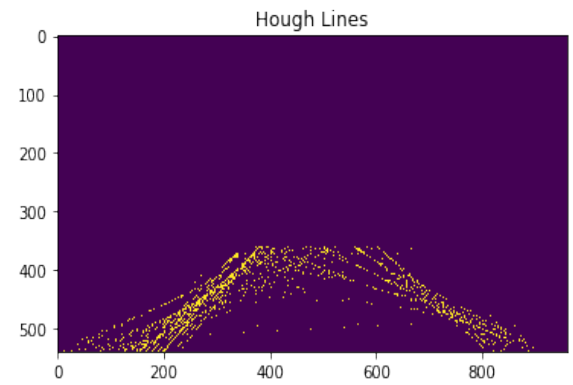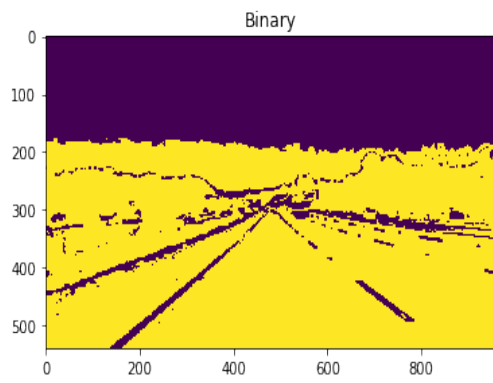
Linear Regression:

- Linear Regression is implemented in an interesting way, it returns two lines for the left region and two lines for the right region for highlighting lanes. Final results for few images are: