Lab 8 builds upon the line following code (so students must get that working first), and there's a number of parameters that must be adjusted and tweaked.

Most of the important parameters are found in `launch/lab8_localize.launch`. The most important is course_length, calculated by having Jet do several laps around the circular track and measuring how many encoder ticks it requires.

Admittedly, the description for lab 8 is a bit vague, so we have created attached graphic that shows the correct setup. The numbers on the graphic correspond to the numbers in the obstacle_map parameter in `launch/lab8_localize.launch`. While Jet is moving around the circle, when it detects an obstacle on the outside, it will increase its confidence that it's at one of the two regions on the "map" where there is an object (labeled with 1's). After sufficient revolutions, Jet should know where it is on the map at all times since it keeps detecting the obstacles during each revolution.

In summary, here are some quick tips for getting the lab to work:
1. Make sure Jet can follow a line on the ground well
2. Carefully measure the length of the circle in encoder ticks and update the course length parameter `launch/lab8_localize.launch`
3. Check to make sure Jet can reliably detect the objects surrounding the circle
4. Debug by printing out the weights and probabilities of the particle filter