1. **Potential Field Based Control.** Consider a point like robot in the workspace with the area \([0; 100] \times [0; 100]\). Represent the obstacles in the environment as circles with centers at \([40; 30]\) and \([70; 40]\) each with radius 5. Assume that the initial position of the robot is \(x_0 = [0; 0]\) and goal position is \(x_g = [100; 60]\).

Write down a function \(\text{GoToAvoid}(x, x_g, x_o)\), which takes as an input arbitrary goal position in the workspace and position of the obstacles and computes velocity vector control command. In this part the velocity vector should be computed as a sum of gradient vectors of the attractive and repulse potential function described in the slides. The additional constant parameters of the potential functions can be set as variables inside of \(\text{GoToAvoid}\). Show the working of this navigation behavior inside of \text{navigationField_script.m} where you fill in the missing code. The example of the script is available at [http://cs.gmu.edu/~kosecka/cs685/code/](http://cs.gmu.edu/~kosecka/cs685/code/).

Submit the Matlab code and plots demonstrating the capability of the robot to avoid obstacles and reach the goal.