Sensor Fusion

1] Changed to be made to the main.cpp:

- You must change the "*DATA_FILE_PATH*" variable at *line 20* in main. The value has to be absolute path to the data file.

2] Command to run the program:

- Command to run the Kalman filter:
  "./TelenavSensorFusion.exe kalman_filter"

- Command to run the Particle filter:
  "./TelenavSensorFusion.exe particle_filter"

3] Output of the program:

```
State vector =   x_value y_value
Lidar measurement =   lidar_measurement_x lidar_measurement_y
State vector =   x_value y_value
Radar measurement =   radar_measurement_x radar_measurement_y
 ============iteration number = 1============
…

…

…

State vector =   x_value y_value
Lidar measurement =   lidar_measurement_x lidar_measurement_y
State vector =   x_value y_value
Radar measurement =   radar_measurement_x radar_measurement_y
 ============iteration number = n============
```

4] Approach:

- Criteria used for selecting the Lidar and Radar measurement for each iteration is: min(Euclidean ($Lidar_i$, $Radar_j$)). We calculate the Euclidean distance of every Lidar and Radar combination in the txt file for every iteration.
- In the txt file I did not find any absolute delta y's to be 1 and hence I have not taken that as a criterion to find the sensor measurement for an iteration
- State vector used for Kalman filter is a 2d State Vector [x-pos, y-pos] where x is the x-coordinate and y is the y-coordiante
- Delta t used is 0.1
- Lidar Measurement Covariance is 0.02 meter.
- Radar Measurement Covariance is 0.1 meter.
- Assumption used is that I have not taken velocity into consideration and hence the velocity of the vehicle is constant
- For particle filter the number of particles used is 25
- For particle filter I have hardcode the landmark positions
  "*vector<vector<float>> land_mrks = {{-50, -25}, {50, 25}};*"
- These land marks position is used to update the weights of the particle