Udacity Term 1 Project 5 – Ma Ruiyuan

This write up is a small handbook on how to run the code.

Environment setup (most tedious part):

On a Windows system, use Ubuntu as operating system.

Modify C++ code in Notepad ++. Upload into GitHub, and clone into Ubuntu.

To run simulation with C++ code:

Step 1: If not the 1st time running Ubuntu on the computer, run below in root folder:

```
rm -R Project_5_Uda
```

Step 2: Clone the Project from GitHub:

```
git clone https://github.com/RuiyuanM/Project_5_Uda.git
```

Step 3: Navigate into project folder:

```
cd Project_5_Uda
```

Step 4: Create a folder 'build', and open it:

```
mkdir build && cd build
```

Step 5: Run Cmake and make

```
cmake .. && make
```

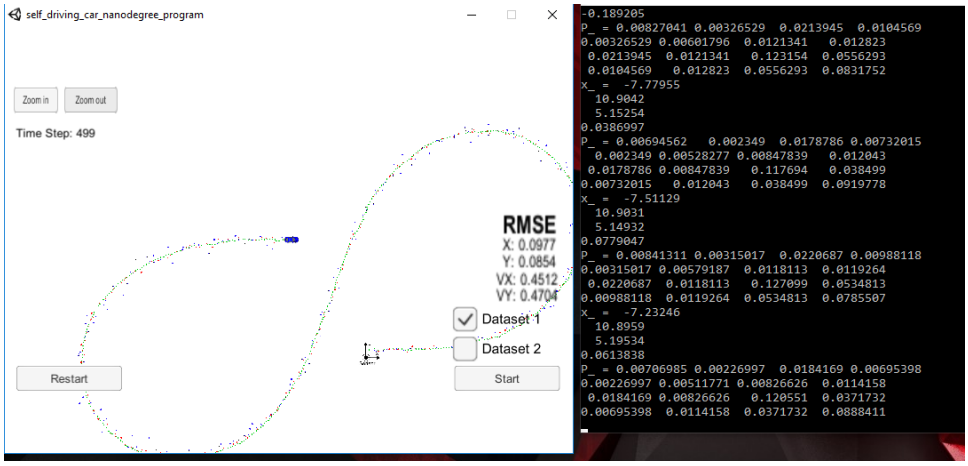
Step 6: Open the simulator on windows

Step 7: Connect with portion inside Ubuntu.

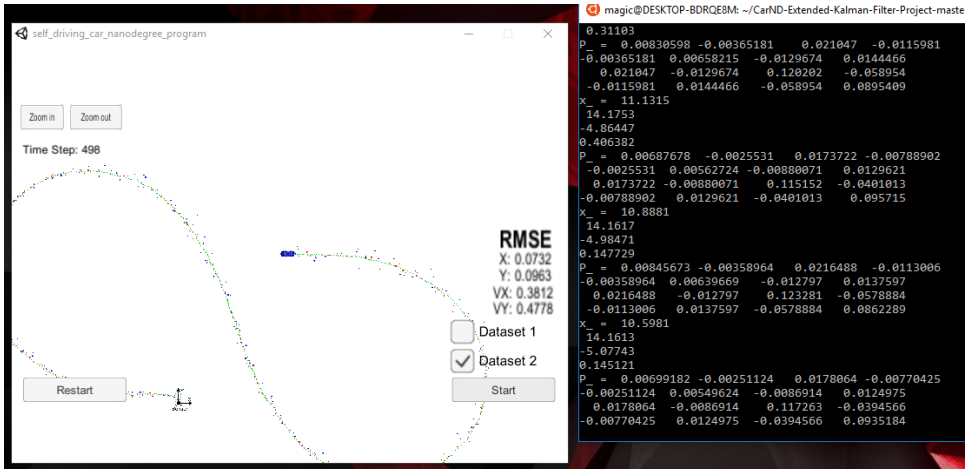
```
./ExtendedKF
```

Step 8: Select data set in simulator and start the simulation

Example: simulation on dataset A



Example: simulation on dataset B



4 main functions:

- main.cpp – reads in data, runs the Kalman filter and calculates RMSE values after each measurement.
- FusionEKF.cpp - initializes the filter, Predict function and Update function
- kalman_filter.cpp- Predict and Update function
- tools.cpp - calculates RMSE and the Jacobian matrix for further usage.

Result:

RMSE for 2 data set <= [.11, .11, 0.52, 0.52]:
A: [0.0977,0.0854,0.4512,0.4704]
B: [0.0732,0.0963,0.3812,0.4778]