LAB2_Sensors

Task1_Odom

the attached file (pose.csv) contain position and orientation for magni robot

- **launch magni robot in empty world.**
- **navigate in empty world using teleop_twist_keyboard node.**
- **reach to required position in csv file.**
- **subscribe from odom topic to get magni robot position**
- **compare robot position and csv position then try to achieve csv file position and orientation.**
- **tolerance in position x,y is 0.5m ,orientation is 5 degrees.**
- **when reach your goal in x,y,yaw read the next position and orientation from csv.**
- **when execute all position in csv file print “i execute all position and last one is <x>,<y>,<theta>”**

Task2_GPS

The attached csv file (GGA_GST.csv) contains real gps data around ITI. It has 2 nmea messages : GGA and GST.
Optional: see these documentation to know more details about values:
https://www.trimble.com/OEM_ReceiverHelp/V4.44/en/NMEA-0183messages_GGA.html
https://www.trimble.com/OEM_ReceiverHelp/V4.44/en/NMEA-0183messages_GST.html

Use these data to publish gps topic named fix in a frequency 5 Hz.
Important data in GGA message:
Latitude, Direction_of_latitude, Longitude, Direction_of_longitude, HDOP, altitude
Important data in GST message:
Lat_sigma_error(lat_std_dev), Long_sigma_error(lon_std_dev), Height_sigma_error(alt_std_dev)

Use these equations to calculate covariance using hdop, Lat_sigma_error, Long_sigma_error, Height_sigma_error
position_covariance[0] = (hdop * lon_std_dev) ** 2
position_covariance[4] = (hdop * lat_std_dev) ** 2
position_covariance[8] = (2 * hdop * alt_std_dev) ** 2

Use publish_gps_message.py as a starter code and check the TODOs.

Instructors repo Link:

1- https://github.com/ahmedgharieb1
2- https://github.com/M-abdeen

Material repo :
https://github.com/ahmedgharieb1/ITI_LSV_ROS2