BITS F327
Assignment 2

Due Date: 22/02/2023 Total marks 10

1. Use the Assignment 1 code: Take Robot circle dia (l_R) as the distance between two wheels of a differential drive robot and wheel dia d ($=l_R/2$).
   a. Find the wheel velocities from the robot motion, and plot ω_1 vs t and ω_2 vs t. [2]
   b. Take random 50 samples of a normal distribution (for every iteration), where mean μ is the wheel velocity (ω_i, i = 1,2) and standard deviation is $\sigma = l_R/10$ for one iteration. Plot the probability distribution of these 50 sample data for the first iteration. [1]
   c. Due to the randomness (normal distribution) of the wheel rotation all 50 instances will not reach at the same pose.
      Make a scatter plot all these instances after 10 iterations (Only dots for the position of the robot, circle and line are not necessary). Also, show the path for reference. [2]
   d. Generate a simulation of this scatter samples starting from the initial pose at t_0 and gradually moving along the given trajectory. [5]

Submission:
1. Doc file with the plots of 1a, 1b and 1c.
2. Python file with the complete code (If using Collab: import all the libraries used in the code. It will help us to check the code)
3. Video file generated for the simulation of 1d.