CSIP5202 - Lab 3 Handout

TASK 1:

Write an program which makes the robot drive (approximately) the path shown from the image below.

- In iRobot Create Simulator Toolbox, you can use the travelDist() and turnAngle() functions.
- In CoppeliaSim make use of setting the targetVelocity of each motor and timing how long it takes the robot to travel a distance, use for loops like the example code in 'simpleExample.m'.
- Your program should make use of iterative structures to minimise repetition in your code.
- When your program works run it five times, and note where the robot finished. What do you notice?
- How would you measure the accuracy of the robot following this path?
    - In iRobot Create Simulator Toolbox use Matlab's functions and visualisation tools to plot the paths your robot followed, from the data saved. Select the "Save data" selector to keep track of your robot's movement in each run/
    - In CoppeliaSim you can see the position data using built in graphs then export the data as a csv:
        - Right click on the Pioneer object in the scene hierarchy and choose Add/Graph
        - Double click on the newly created Graph icon
        - Add a new data stream to record
        - Select data stream type Object:Absolute x-position and Object /items to record: Pioneer_p3dx then click ok, rename Data [pioneer_p3dx] by x
        - Repeat step 4 selecting Object:absolute y-position renamed by y and Object:absolute z-position renamed by z
        - Click on Edit 3D curve
        - Click add new curve and associate X- , Y-, Z-value respectively by x, y, z then click ok
        - After you stop the simulation, if you select the Graph and go to File/Export/Selected Graphs as CVS, you'll be able to save the points coordinates in a text file.
    - Measure the position deviation range of the end point. You can have 2 measurements of error:
        - Error between runs (repeatability relative to itself)
        - Error against the desired end point (accuracy relative to the ideal result