Task 1.2 - Problem Statement

In this task you have to program the robot that can scan the color of the Nuts, pick it from PICK-UP ZONE and place it in the correct DEPOSIT ZONES. The DEPOSIT ZONES are at different locations on the arena marked as D1 and D2 in Figure 1.

- Arena for the problem statement is given in Task folder - Task_1.2.ttt file.
- It is made up of circular, curved and straight paths with a START position. You can Refer to Figure 1.
- **Nuts** are of two types - Red colored and Green colored Nuts, at start of run they will be randomly placed in PICK-UP ZONE. There will be two nuts of each color.
- Upto three **Obstacles** will be randomly placed on the arena as shown in Figure 2. The robot has to avoid these obstacles and follow the optimal path. You can use any path-planning algorithms to do so.
- You have to program a robot which will start from START position, follows the line, picks the Nuts and deposits them at DEPOSIT ZONES as per the configuration Table 1.
- After completion of task, robot has to return to START position to signify end of run.
- Points awarded will depend upon the total time required to finish the run.
- Points will be deducted for any collisions or incorrect placements.
- Team can change the Nuts, Obstacles and DEPOSIT ZONES position to check the code.

Table 1: Nuts Deposit Zone

DEPOSIT ZONE	COLOR	CAPACITY
D1	RED	2
D2	GREEN	2

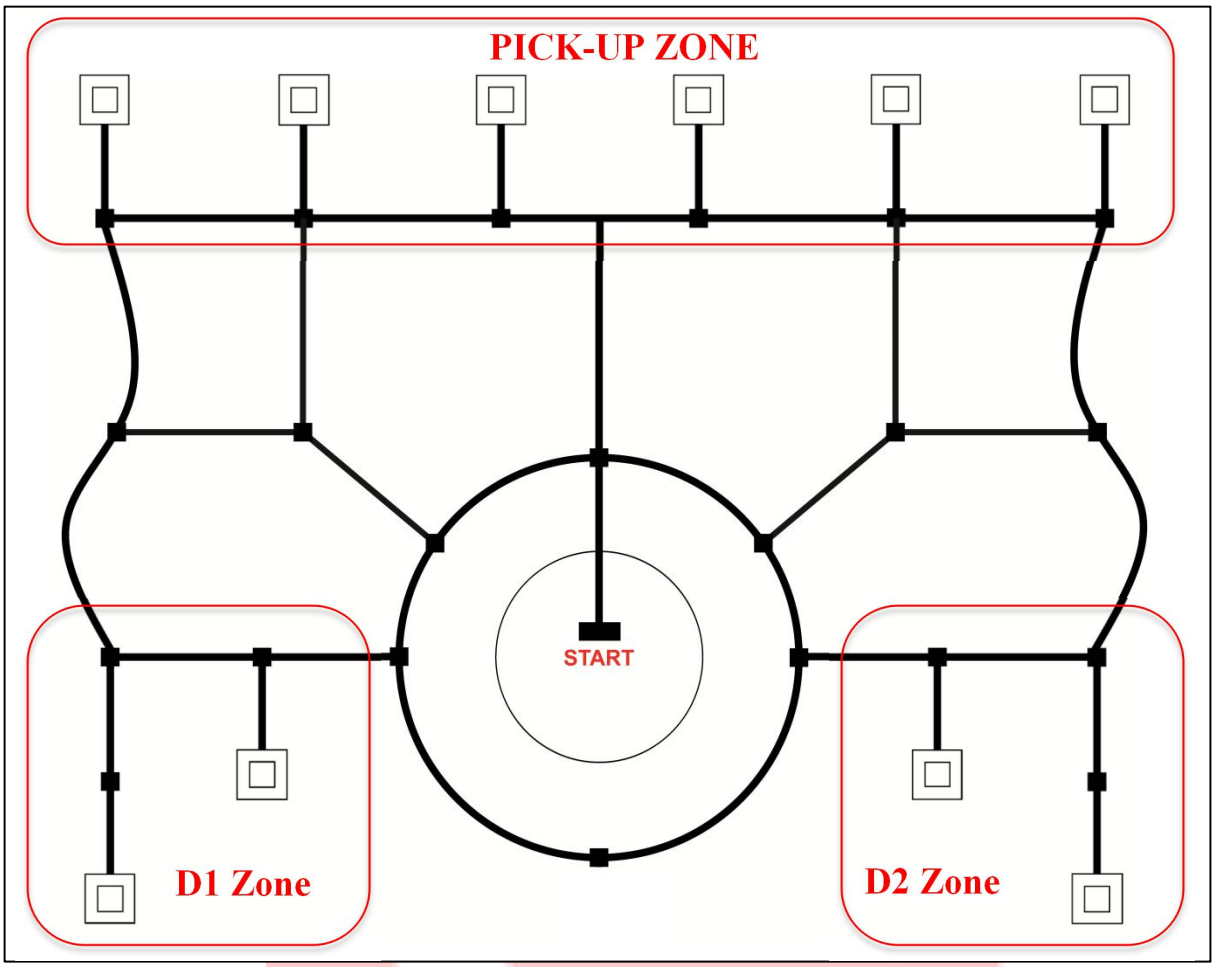

Figure 1: Arena for the Shape

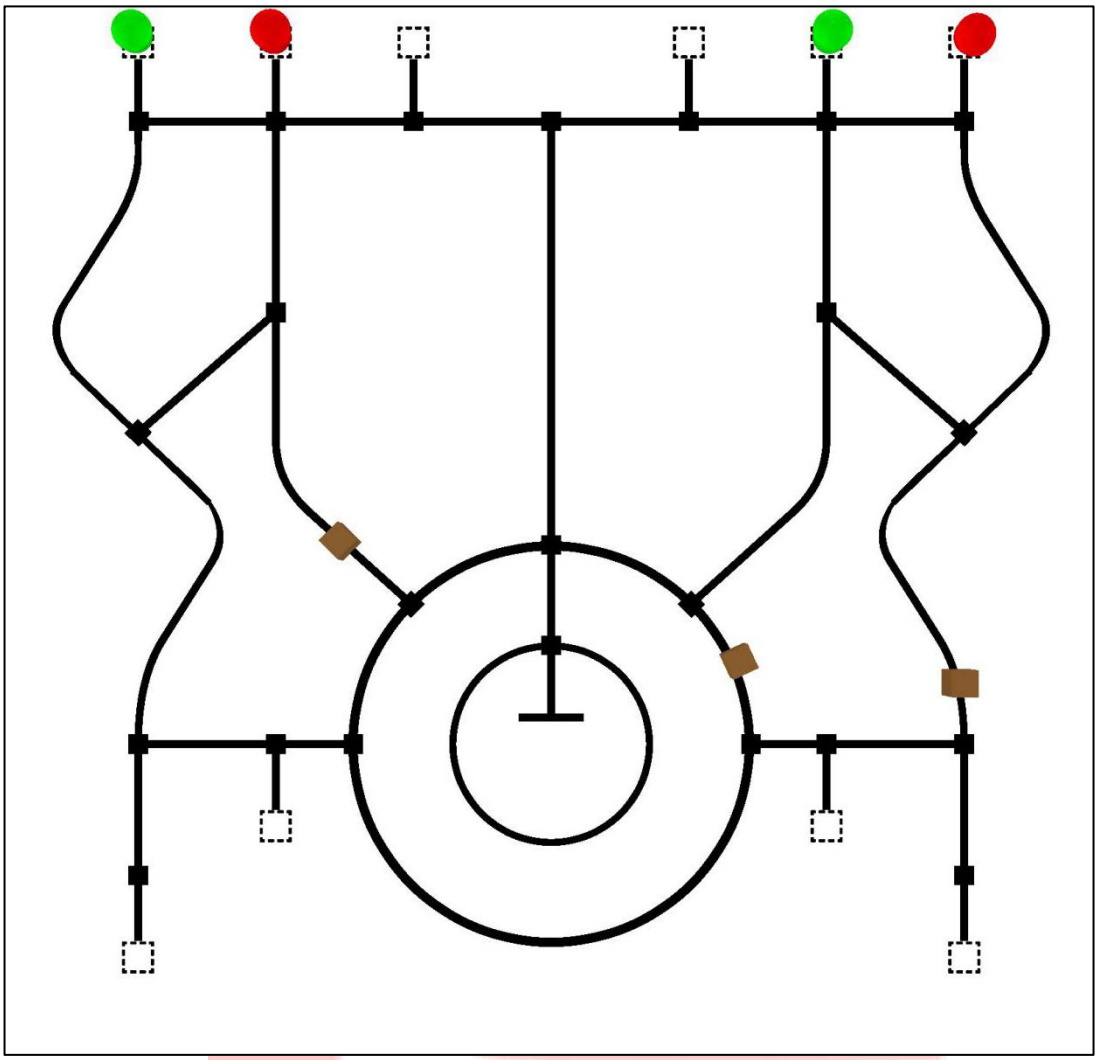

Figure 2: Obstacle placement example

Rules for the Task:

- You have to strictly implement a line-following algorithm. Submissions in which the robot goes off the line will not be evaluated.
- Nuts should be placed within the dotted square in DEPOSIT ZONES.
- The robot should return to the START position to end the run.
- Obstacles will not be in DEPOSIT and PICK-UP ZONES.
- Do not delete any components from the scene.

Programming Instructions:

- For this task you will make changes and further additions to your NS_Task_1_Sandbox.cpp file and NS_Task_1_Sandbox.h
- You may declare new functions and global variables.
- You are not permitted to modify files apart from NS_Task_1_Sandbox.cpp and NS_Task_1_Sandbox.h file.
- The only exception to this is the NS_Task_1.cpp file which contains the main function.
- In the main function, you should uncomment the function "Task_1_2", and your entire Task Logic should be called from this function.
- During evaluation, any other modifications to your main function will not be considered.