

**REGULATIONS:**  
**MAZE LINE FOLLOWING COMPETITION**

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## 1. Introduction

1. The Maze Line Following challenge is a variation of the well-known Maze Solving challenge, except that the maze is bounded by various forms of black lines that the robot must interpret, avoid the various dead-ends that may exist, in order to follow the correct path to reach the destination in the minimum possible time.

## 2. Objective

1. In this challenge, the mission of the autonomous robot is to drive through a labyrinth, a maze, from specified corner to a specified ending point in the shortest possible time.

## 3. The Team - Eligibility of Participation

1. The competition accepts participation of teams and not individuals.
2. The team consists of two (2) – five (5) persons.
3. **Only one player** of category X is eligible to participate in a team of the immediate higher category. That is:
  - A player of category «4th – 6th Grade Primary» is allowed to participate in a team of category «Gymnasium»
  - A player of category «Gymnasium» is allowed to participate in a team of category «Lyceum»
  - A player of category «Lyceum» is allowed to participate in a team of category «Adults».
  - The opposite of the rule 3.3 above does not apply. That is, one player of category X is not allowed to participate in a team of any lower category. For example, a player that belongs in category «Lyceum» is not allowed to participate in a team of category «Gymnasium» or «Primary 4<sup>th</sup> – 6<sup>th</sup>»; a player in the «Adults» category is not allowed to participate in the category «Lyceum» or «Gymnasium» etc.
4. The coach of the team is not allowed to participate in the same competition with his/her team.
5. The team defines one of its members as a leader who will be responsible for the communication with the Organizing Committee and the judges, for the technical control process and for operating the robot during the competition.

## **4. The Robot**

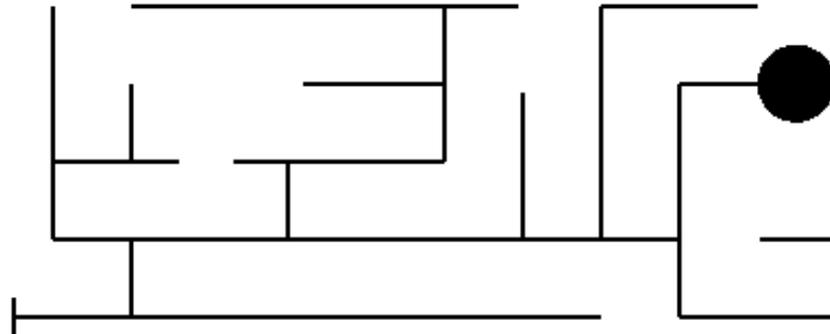
1. The robot shall be autonomous and self-contained (no remote controls).
2. The robot shall not leave any part of its body behind while negotiating the maze.
3. The robot shall not scratch, cut, burn, mark, damage, or destroy the field of the maze.
4. The maximum dimensions of the robot are (16 centimetres length X 16 centimetres width).
5. If a robot changes its geometry during the competition, its dimensions must still be at the maximum dimensions indicated above.
6. There is no restriction on the height of the robot.
7. Any violation of the above rules will constitute immediate disqualification of the robot from the competition.

## **5. The Maze**

For the competition the following apply:

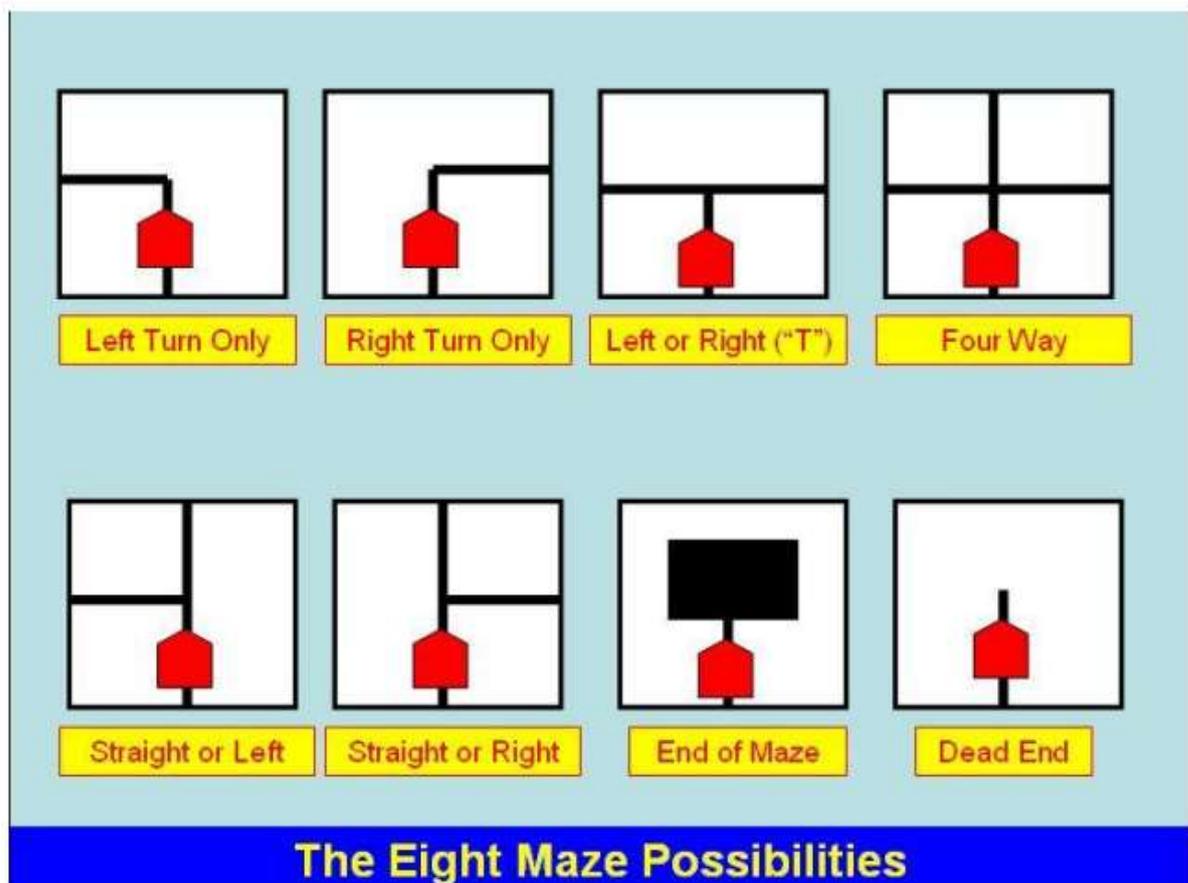
1. The maze field consists of a black line, 2 cm thick, printed on a white background.
2. The field consists of horizontal and vertical lines that are interrupted and parallel to each other. The maximum number of lines is 18 horizontal and 18 vertical lines, in accordance with the standard track provided.
3. The parallel lines of the maze are at least 16 cm apart.
4. The starting point of the maze is located at one of the four corners of the track and is a "T" shaped line.
5. The destination is the centre or any other point in the maze which is an area of solid black square, measuring at least 20 cm x 20 cm (or a circle of diameter 20 cm).
6. The robot should be able to detect the destination square and stop once it has passed its entrance.
7. The destination has only one entrance.
8. The maze of the competition remains secret until the competition day. Participants are expected to take into consideration the details above and develop a generic code that can perform successfully on any maze.

## 5.1 Indicative Field



## 5.2 Typical Lines of the Maze

The following images indicate situations that the robot may reach and must be able to resolve in order to proceed in order to reach the termination point of the maze.



## 6. Robotic Platforms, Categories & Levels

- The competition is organized separately for the robotic platforms, categories and levels indicated in the table below:

**Table 1: Platforms, Categories & Levels for LINE MAZE Competitions**

Challenge	Robot Platforms	Primary 4 <sup>th</sup> – 6 <sup>th</sup>	Gymnasium	Lyceum	Adults
LINE MAZE SOLVING	ARDUINO, KYPRUINO, MAKEBLOCK, MICRO:BIT RASPERRY Pi, ARM, ESP, SELF-DEVELOPED ROBOT			√	
LEGO LINE MAZE SOLVING	LEGO EV3, LEGO SPIKE PRIME			√	

## 7. The Competition

1. Each competing robot is allocated a total of five (5) minutes of access the maze.
2. The robot can attempt the maze as many times as required during the available time of five (5) minutes.
3. Any time used to adjust a robot between runs is included in the five (5) minutes.
4. The run timer will start when front edge of the robot crosses the start line and stops when the front edge of the robot crosses the finish line
5. Each run shall be made from the starting square. The operator may abort a run at any time.
6. If the leader/operator touches the robot during the route, the attempt is considered void and the robot has to return to the starting point.
7. The leader of the team is allowed to:
  - change switch positions;
  - adjust sensors;
  - make repairs in case the robot breaks down.
8. Every time the robot reaches the destination square successfully, its time is recorded in the system.
9. The minimum time amongst the attempts of the robot will be the official time for the robot.
10. If the robot does not reach the destination at all, then the robot's distance from the destination is recorded and taken into account.
11. The distance is defined as the number of successive squares from the destination.

## 8. Declaring the Winning Team

1. Upon completion of the process robots will be ranked based on their category, minimum time and the minimum distance from the destination.
2. The winner per category/level is the robot with the minimum official time.
3. In case that no robots reach the destination (and thus they have no official time), the winner is the robot closest to the destination square, i.e the robot with the smallest number of consecutive squares from the destination.
4. In the event of a tie, either on time or on the distance, an extra match is made amongst the robots in tie.
5. Based on this race, the winner is decided for the first round, per robot platform and category/level.
6. The winner robots per category/level will be promoted to the final round (best-of-the-best round).
7. In the final round robots will have the field available for five (5) minutes and the procedure described in paragraph «**7. The Competition**» will be repeated.
8. Upon completion of the final round, a ranking will be made to declare winner robot.

## **9. Terms and Conditions of Participation**

1. Participation in ROBOTEX CYPRUS assumes and requires acceptance of all terms and conditions for participation by competitors, the coaches and the organizations they represent.
2. In case of any difference in the competition rules between the English and the Greek versions, the English version is considered as correct.
3. The robot must be registered before the competition. The registration process includes technical inspection of the robot, marking the robot with a number sticker, and the order in which it will compete which is generated by an algorithm in the information system supporting the ROBOTEX CYPRUS organization.
4. In this challenge, there are two (2) judges. An additional head judge may also be present to supervise the whole process.
5. All questions and issues that may arise during the competitions must be reported to the judges.
6. The final decision about objections will be taken by the judges in cooperation with the Scientific Committee.
7. Judges' decisions on any objections are considered final and can't be challenged by participants, the coaches or the organizations they represent.
8. In the case of a deliberate alteration or change of marking of the unique number of robots, the coach and his team will be automatically expelled from the event. As a result, they will not be able to take part in any other challenge they may have enrolled. The coach and his team will leave the venue immediately. The coach also loses the right to take part in the next ROBOTEX CYPRUS event and is automatically excluded from participating in ROBOTEX INTERNATIONAL in case one of his/her teams has won a ROBOTEX CYPRUS competition. The Organizing Committee reserves the right to publicly announce the coach, the team and its members.
9. It is expected that both the coaches and the members of the teams will exhibit a spirit of noble rivalry and will behave with mutual respect, decency and esteem both to themselves and to the organizers, judges and volunteers. The behaviour of all coaches and team members should promote "fair play". Therefore, the Organizing Committee reserves the right to expel anyone from the venue of the event who violates the above principles of good practice.

## 10. Robot Technical Control

1. An initial technical control of the robot technical control will take place on the day of the competition at an area and on time specified by the organizers.
2. Technical control takes place before each phase of the competition (preliminary, qualifying, final) in which the team may participate.
3. Failure of a team to come in time for a robot's technical check leads to the team being excluded from the event.
4. The leader of the team only is responsible to take the team's robot for technical control.
5. Technical control includes the control of the robot based on the above and the section «4. **The Robot**». If the robot does not meet the requirements it will not be accepted to compete and will automatically be disqualified from the event.

## 11. Changes and Cancellation of Rules

1. Any changes and/or cancellations in the rules of the competition are decided by the Cyprus Computer Society in consultation with the Organizing Committee of ROBOTEX CYPRUS. You may address comments and suggestions to the Organizers at [robotex@ccs.org.cy](mailto:robotex@ccs.org.cy).