



REPUBLIC OF TURKIYE
MINISTRY OF NATIONAL EDUCATION
The General Directorate
of Technical and Vocational Education

15th INTERNATIONAL MoNE ROBOT CONTEST

MASTER OF LABYRINTH RULES

INTERNATIONAL
MoNE
ROBOT
CONTEST



RULES

1) Objective

The aim of this competition is that an autonomous robot moves from start point should solve the labyrinth and arrive exit in shortest time with minimum penalty.

2) Format

Only robots that meet the requirements stated in the application manual will be able to participate in the competitions.

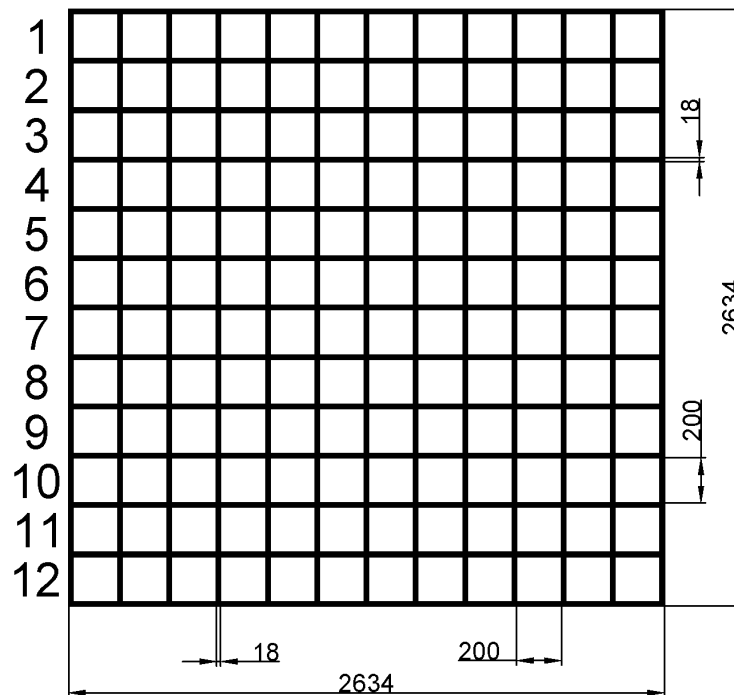
In this competition, robots will move from starting point and find exit inside labyrinth which made white walls and black ground as soon as possible. Completing the game is essential.

The competition consists of three rounds. The order of competition in each round is determined by lot. In the 1st round, the registered robots compete. After the completion of the competitions in the first round, the track is organised and the 2nd round is started. The first 40 robots, whose time to complete the track and penalty times are calculated in the first round, pass to the 2nd round. In the 2nd round, which starts by organising the walls, the first 20 robots, whose time to complete the track and penalty times are calculated, pass to the final round. In the final round, the results are announced by ranking the robots with the best times among the robots whose time to complete the track and penalty times are calculated. In the event that less than 40 robots complete the track in the first round and less than 20 robots complete the track in the second round, the ranking and other details are explained under the heading "**6) Competition Rules and Execution of the Competition**".

3) Specification of Competition Track

- The height of the walls of the labyrinth will be 10 cm, thickness 18 mm white coloured wood.
- The floor is made of black matt wood and the walls are made of white glossy wood.
- The labyrinth matrix consists of 12 x 12 squares and the size of each unit square is 20 cm x 20 cm.
- The start and end points are 20 cm x 20 cm and are inside the track matrix. The start point can be located in row 1 of the matrix, the end point in row 12 of the matrix and in any cell. The end point has a white area of 20 cm x 20 cm.
- The margin of error for the specified dimensions is 5%.
- The maze may contain dead ends, closed cells that robots cannot enter.
- In the 2nd and final stage of the competition, changes will be made to the track walls. There may be unevenness on the track floor and walls caused by paint, tape, etc. and such factors.

DIMENSIONS



4) Robot Specifications

- Robot will be autonomous. It is restricted to control robot via wired or wireless connection. It is not allowed that robot has any communication modules / internal-external equipments (include ones using for uploading program by wireless connection.) on its body even if they are disabled in software/hardware. In every stage of competition (even if it is winner), if any violation against to this rule is determined, robot will be disqualified and organisation committee will be informed for other sanctions.
- There is no restriction (partially) about robot dimensions. Competitors should design their robots by considering game board specifications. Detailed information given at sections "**6) Competition Rules and Execution of the Competition**" and "**3) Game Board Specification**"
- There is no restriction for sensors using to sense ground and walls.

5) Competition rules

- Any time for break or maintenance will not be given.
- It is forbidden to fix, test or uploading program at the moment of game. In other case, robot will be disqualified.
- It is not allowed to put any sign or mark permanently on the game board or to damage it. Robots which damage labyrinth will be disqualified. Judges are authorized to decide cleaning or fixing labyrinth.
- Game board dimensions can be changed slightly if it is necessary.



- Any objection related with lighting , camera ,led boards or noise of hall will be refused.
- Robots can use an energy source such as battery or battery pack. Flammable or liquid type energy sources are forbidden.
- Competition organisation committee has rights to make all kinds of modifications about the rules of contest in case of necessities.

6) Competition rules and executing

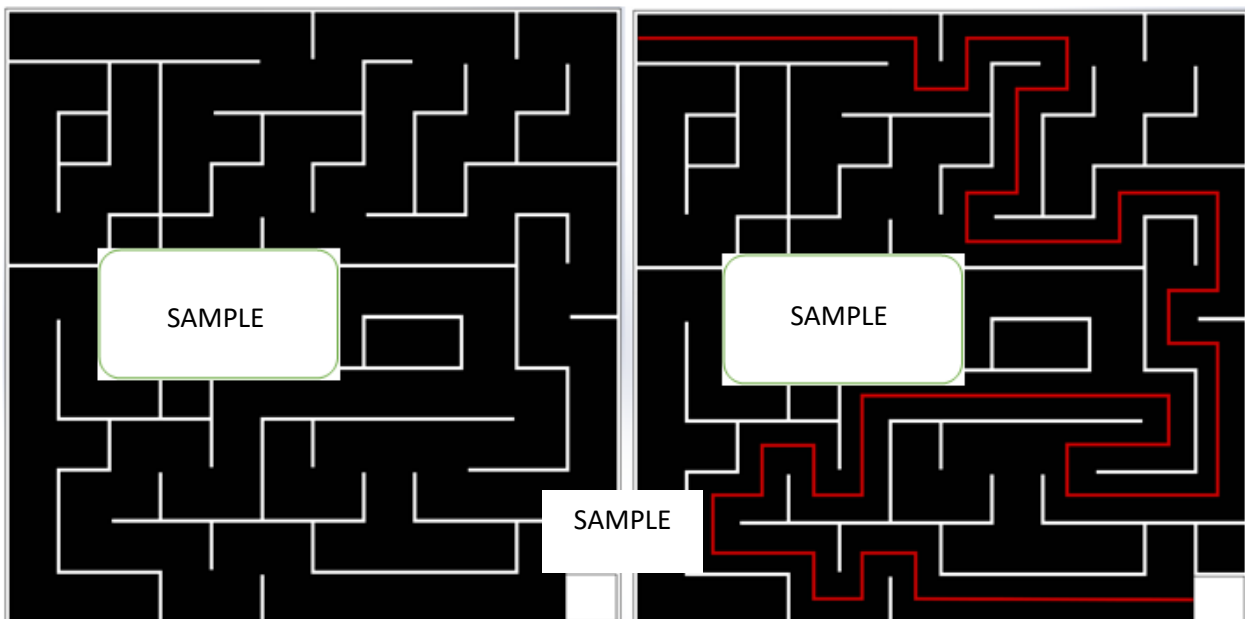
- Competitor will bring robot without battery to registration desk. After the registration, the robot will be placed in the transparent, lidded and hole-free box brought by the competitor without the battery installed. The box with a transparent lid will be closed with the methods determined by the technical advisors of the competition to be opened only under the supervision of the referee at the time of the competition and will be delivered to the competitor. Competitor will keep box without opening until game. Competitor can take some precautions to stop movement of robot inside box. Tranparent box has 35cmx45cm dimensions. Competitors must bring their own box. Robots that come to packaging without a box will not be processed and will not compete. If box is damaged, teared or opened etc, robot will be disqualified. Competitors who do not pack their robots from the 1st round and the final round will definitely not compete even if they register, all responsibility belongs to the competitors.
- The 40 robots that qualify to compete in the 2nd round will not be called for packaging and safety precautions. After the robots passing to the final round are announced, an announcement will be made and the robots will be called for the final round and the same security measures will be applied again. Security measures to be applied in the final round It is the competitor's responsibility to follow the calls. In the 1st round and the final round, the referees are authorised to decide whether the safety precautions are complied with or not.
- At first level, one or two same labyrinth (game board) will be built depends on number of partipations. Practice is not allowed before game. At the second level, one or two same labyrinth (game board) will be built depends on number of partipations. Practice is not allowed before game. At the final level, only one labyrinth (game board) will be built and practice is not allowed before game.
- Competition order list is determined by draw lot and it is announced.
- Start and finish points are located in different places on labyrinth. All robots starts from same start points and finish same points.
- After finishing first level, game board is modified for second level games.
- After finishing second level, game board is modified for final games.
- Time is started both judge and chronometer connected to sensors placed on game board. Chronometer doesn't stop after start.
- Total game time cannot exceeded 150 sec in first level, 120sec in second level,150sec in final game.



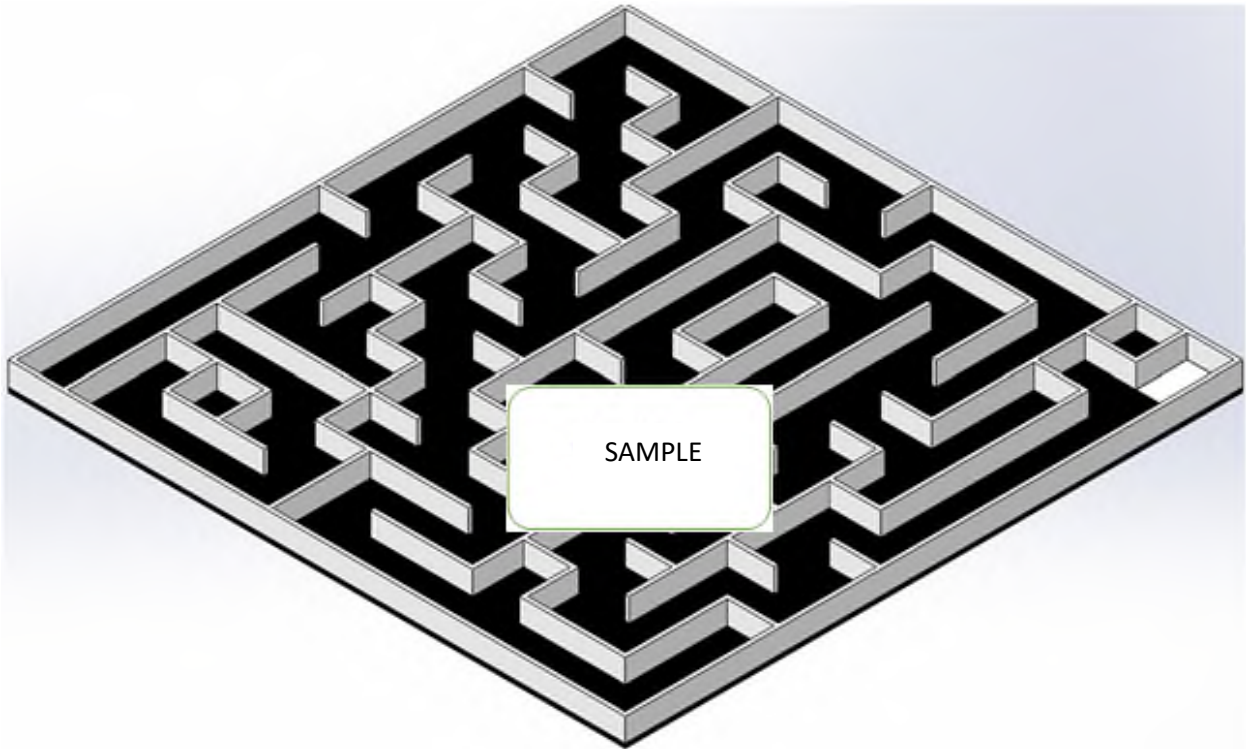
- The competitor who comes to the competition area for the 1st round and the final round gives the box containing the robot to the referee for examination. When it is understood that the safety measures are not damaged, the box is opened and the battery is installed after opening the box. The robot is weighed to determine the ranking if necessary, the weight of the robot is noted by the referee.
- The stopwatch start sensor is located in the cell after the start. The stopwatch end sensor is located near the entrance of the end cell. Sensors can be located on the left or right wall. The sensor may protrude on the side walls, causing thickness. The sensor assembly may include reflective tape placed on the walls. The sensor may emit light.
- The robot is placed where the competitor wants in the starting cell indicated by the referee. The front side of the robot will be placed straight towards the direction of movement. If the robot does not move after the robot is placed on the track, the robot is taken from the track by the competitor with the request of the competitor and the approval of the referee and / or with the request of the referee, the robot is taken from the track by the competitor and checked and put back to the starting point, the robot is given a 10 second time penalty. Competitors can intervene a maximum of 3 times to robots that cannot start (10 seconds time penalty is taken for each intervention). The robot that cannot start the competition despite the interventions is eliminated. When the robot moves to the 2nd cell and the time starts, the competitor cannot interfere with the robot. The time starts when the robot enters the 2nd cell. If the robot passes to the 2nd cell due to a problem that may occur in the stopwatch and the time does not start, the time is kept by the referee, it is the authority of the referee to decide whether the robot has passed to the 2nd cell or not.
- If the robot stops from the 2nd cell, remains motionless, gets stuck in dead-end streets, remains unmanoeuvred on a wall and the robot cannot provide the appropriate movement, the robot cannot be intervened. 150 seconds in the 1st round, 120 seconds in the 2nd round and 150 seconds in the final round are expected to expire, the line number in the farthest cell that the robot reaches from the starting point is determined and noted by the referee. The referee is authorised to decide the line at the end of the competition.
- Robots will stop by detecting the white area at the end point. The competition ends when the sensor in the end area detects the robot. In the finish cell, the robot must wait without moving for 5 seconds. During this time, the robot is not taken from the track. The robot that takes the robot without the referee's approval or leaves the finish cell within 5 seconds will be penalised 10 seconds.
- The time score calculation principles are as follows.
 - a. The total time of the robots completing the track is found by totalling the time of the penalties and the stopwatch time at the end of the competition. The robot with the lower time is ranked higher. In case of equality of the time of the robots completing the track, the lightest robot will be ranked higher than the heavier robot.
 - b. In robots that can start but cannot complete the track, the row number of the cell at the end of the competition is checked. Total time is found by the formula " $200+(12-\text{row number})\times 10+\text{time penalty}$ ". The robot with the lower time is ranked higher in the ranking. In case of time equality of the robots completing the track, the lightest robot will be ranked higher than the heavier robot.

- c. Robots that cannot start take place in the ranking with 400 seconds. It cannot move to the next round.
- d. Robots that register and do not participate in the competition take place in the ranking with 500 seconds. Cannot pass to the next round.
- e. Robots that disrupt the functioning of the competition and damage the security measures are ranked with 1000 seconds. They cannot pass to the next round.
- In case the robots for the 2nd round and the final round are below the specified number, the number of robots that will go to the upper round is completed by looking at the duration of the robots that can start but cannot complete the track.
- The principles of calculating the competition time in the 2nd and final round, which is started by making arrangements on the track, are the same as the first round.
- After the 1st round competitions are completed and the first 40 robots are announced, the 2nd round track will be published on robot.meb.gov.tr. For the 2nd round, robots will not be packaged, the competitor will be able to make his robot ready by using the method he wishes according to the published track. 2nd round races will also be held according to the above rules. In the 2nd round, robots will be weighed before the competition. In case of time equality in the rankings, the lighter robot will be ranked higher. With the ranking in this round, 20 competitors will proceed to the final round.
- After the 2nd round rankings are announced, the final 20 robots will be called for security measures and security packaging will be done. The competition will be held according to the above rules and the ranking will be determined and announced.

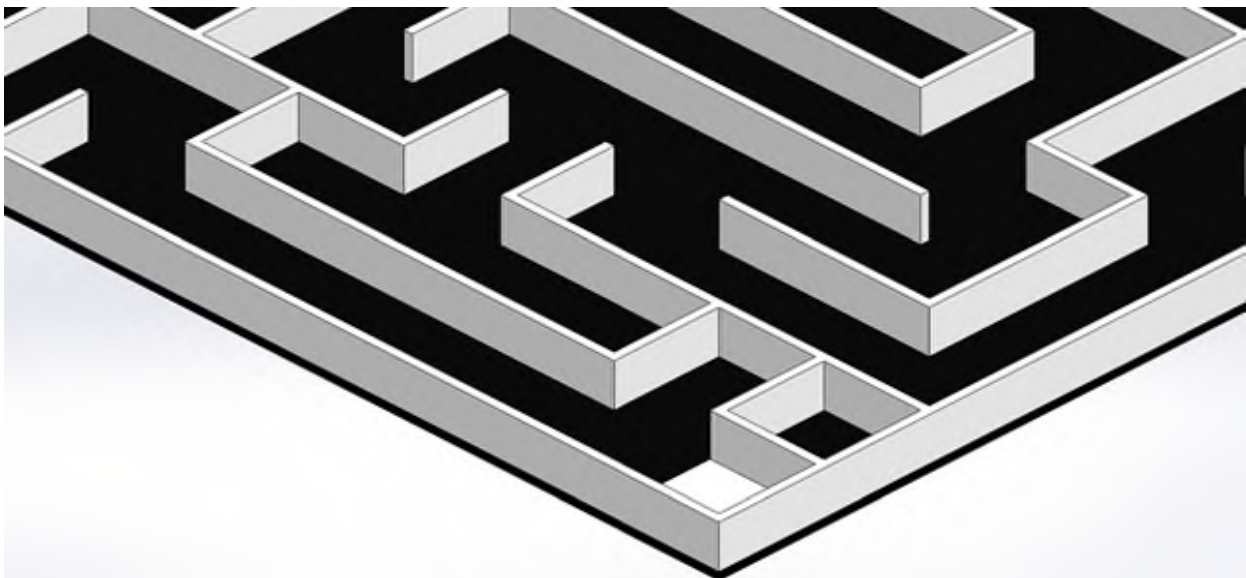
SAMPLE VIEW OF A LABYRINTH



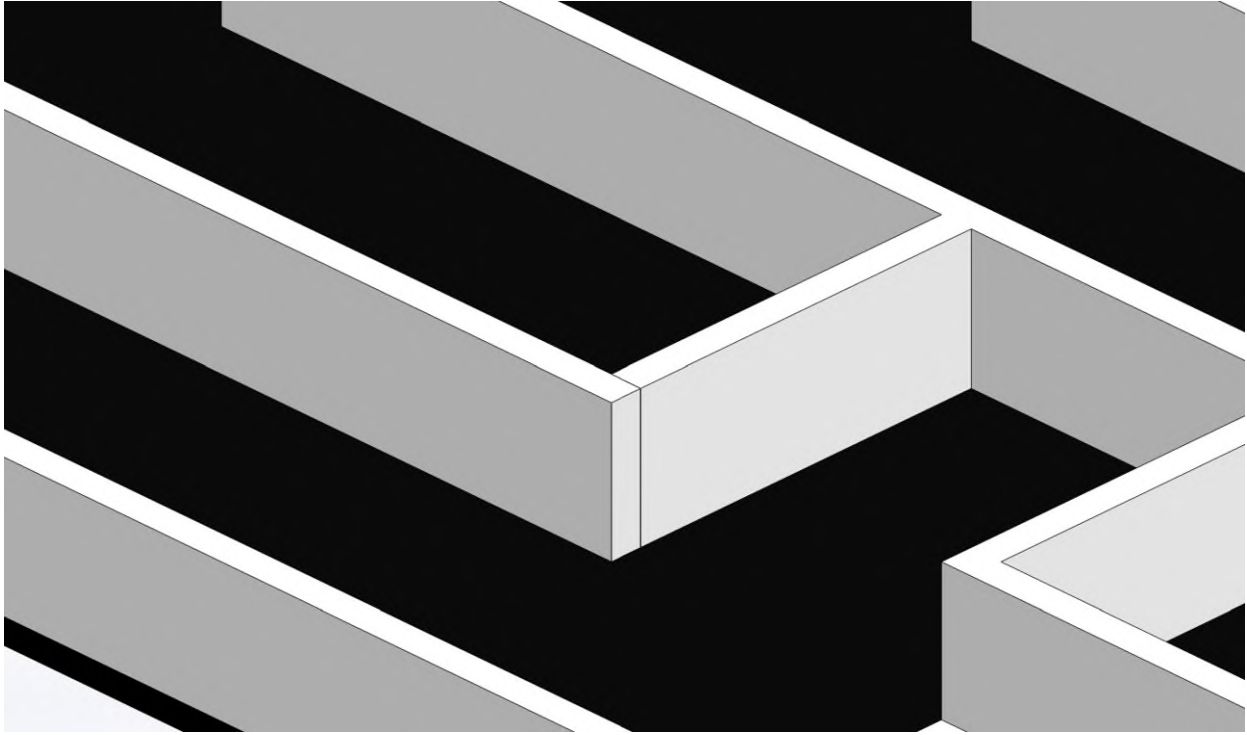
*This is a sample track. It does not represent the track in the competition.



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*This is a sample track. It does not represent the track in the competition. Joints will be as it is shown in figure