Kegelring

General Description:

The goal of this contest is to build and program a robot that can clear the field of pins. The control system of the robot can be **anything except Lego EV3.**

Registration rules:

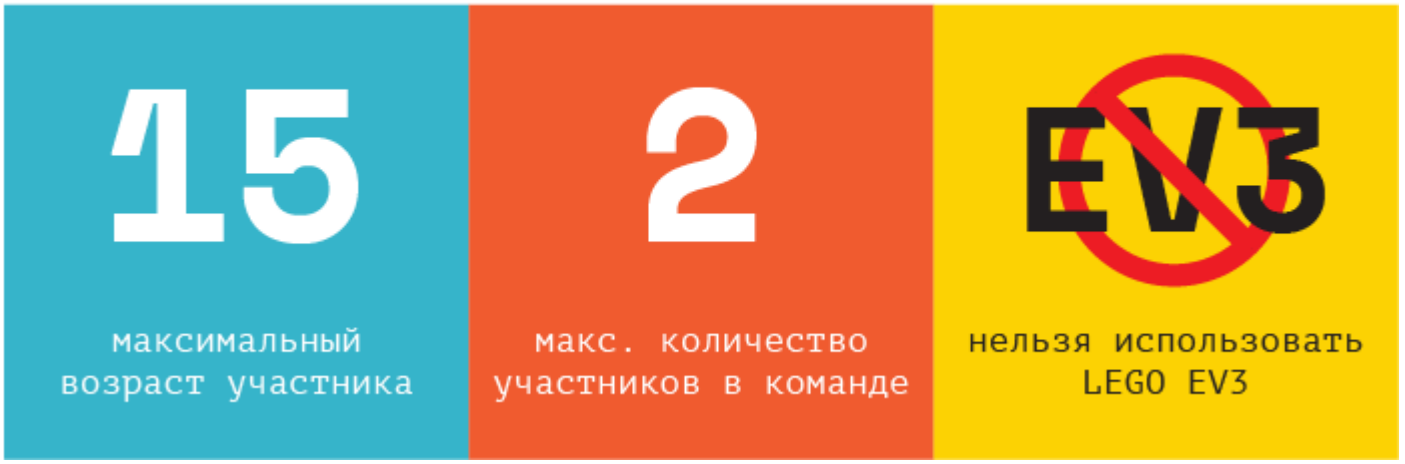
1. The maximum number of participants in the team - 2 participants.
2. The maximum age of the participant is 15 years old.
3. The organizers reserve the right to talk to the winner to confirm that he/she is 15 years old or younger and that he/she wrote the program.

Playing field and game elements

1. **Field 1.5 m x 1.5 m** with a ring with a diameter of 1 m with a black border of 5 cm.
2. The red dot marks the center of the circle.
3. Skittles are empty aluminum 0.33 liter beverage cans.
4. Inside the ring evenly placed 8 pins. The pins are set at a distance of 10-20 cm from the black border of the ring.
5. For participants in the younger age category, all cans will be painted white, and for participants in the older age category, 4 of the 8 pins will be painted black.

The printable field can be downloaded from:
https://drive.google.com/file/d/1IUm0KSDfDK7EXw5MsUIcjO5WBgIRhRTo/view?usp=sharing

KIRC Kegelring Challenge



Category Rules:

Robot requirements:

1. The robot must be autonomous
2. The robot must enter a cube with dimensions 20x20x20 cm.
3. The robot cannot increase in size in any situation.
4. The control system of the robot can be **anything except Lego EV3**
5. It is forbidden to use structures that may cause physical damage to the ring or pins.

General Conditions:

1. The tournament organizers will allow access to the playing field to set up and test the robots prior to the start of the competition as scheduled.
2. At the beginning of the competition, the number of pins (4 to 6) on the field throughout the competition is determined by drawing lots
3. Prior to the start of the round, teams must place their robots in the "quarantine" area no later than 5 minutes after the round is announced. Once the judge has confirmed that the robots meet all requirements, the competition may begin.
4. If the inspection reveals a fault in the design of the robot, the judge gives 3 minutes to correct the fault. However, if the violation is not corrected within this time, the team will be disqualified until the next round.
5. Once a robot is placed in "quarantine" until the end of the round, you cannot:
   5.1. modify robots (e.g., load a program, change batteries);
   5.2. change robots;
   5.3. to take away robots without the judge's permission;
6. At the end of the attempt, teams must return their robots to the quarantine area before the end of the round.
7. Teams are responsible for submitting their robots for re-inspection if they do not pass the judging committee's inspection or if their design has been changed during the competition.
8. All modifications must be made within the time stipulated in the competition rules. Teams must not delay a round due to modifications.

9. Before the start of the attempt, the positions of pins on the field are determined by drawing lots.
10. The arrangement of pins is the same for participants throughout the round.

Competition Day Rules:

1. The competition consists of two attempts. Each attempt consists of a series of runs by all robots allowed in the competition. A run is an attempt by one robot to complete a task.
2. After the judge announces the start of the race, the robot is placed in the center of the ring, so that its projection on the field is placed in the orange zone in the middle of the ring.
3. Before the start of the race, the robot operator may correct the arrangement of the cans if their location does not comply with the rules. After the start of the race, no complaints about the arrangement of the cans before the race will be accepted.
4. At the judge's command the start signal is given and the operator must start the robot.
5. Team members and the leader must not interfere with their team's robot or the opponent's robot, either physically or from a distance. Interference leads to immediate disqualification.
6. Time stops and the race ends if:
    a. The robot is outside the black line of the ring for more than 2 seconds.
    b. All pins to be pushed are "out of the ring".
    c. The maximum run time of 60 seconds has elapsed.
    d. At the verbal signal "Stop!" from a participant.
7. After stopping the race, the robot will get the number of points it has earned up to that point.
8. A pin is considered "out of the ring" if it is completely in the area outside the black line.

Judging:

1. The Organizing Committee reserves the right to make any changes in the rules of the competition, if these changes do not give an advantage to one of the teams.
2. If there are any objections to the judging, the team has the right to appeal in writing to the Organizing Committee no later than 10 minutes after the attempt.
3. A replay may be carried out by decision of the head referee in the event that the robot has been tampered with, or if the malfunction is due to the poor condition of the field of play, or due to an error made by the refereeing panel.

1. The robot is awarded one point for each pins knocked out.
2. Time is awarded only to robots that knock down all pins. If the robot does not score a maximum score, 60 seconds are awarded for the task.
3. The result of the attempt with the highest number of points of all attempts (not the sum) is taken into account when summing up the results. If the teams have the same number of points, the time it took for the team to complete the best attempt will be counted. If the

time to complete the task is the same, the result of the second best attempt will be taken into account.

4. In the case of tied teams, a replay may be announced to determine the winner.