# RoboParty Challenges- Summary

**Welcome to the RoboParty!!** The competition is designed to introduce teams into the RoboCup World. There are 4 different competitions that teams can chose to participate in. Below is a brief summary of the objectives with key rules.

## Activity 1: Maze

The objective of the maze is to program a robot to autonomously find it's way from the start to the end. **All walls of the maze, including the entrance and the exit, will be at least <u>30 cm</u> apart and at least <u>15 cm in height</u>.** The floors and walls of the maze will be white, but the surface may vary in texture. There is no robot size restriction, but it should be able to move around the maze easily.
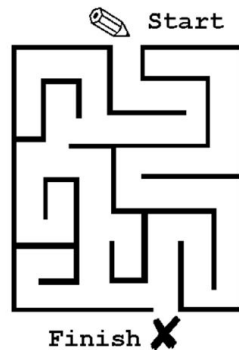


Teams will be expected to program a robot that can get through the maze even if the path changes. Before each round, the walls of the maze will move, this is to avoid any teams from pre-programing their robot to a set path.

During the competition, each team will be allowed 3 rounds at the maze. During these rounds, the teams will be allowed to attempt the maze as many times as they would like in the 120 second trial period. The referee will keep track of their score and retain the best one.

Penalties will incur if a robot hits the wall of the maze (bump penalty = 5 points). Teams may choose to restart their trial without any penalty as long as they complete the maze before the end of their round. It is up to the team captain to decide if they want to avoid the bump penalty or not.

Team Scoring: For example, if a team finishes the maze in 40 seconds, the referee will subtract this from 120 seconds. This means, 120 seconds minus 40 seconds will get you 80 seconds. The team's score will then be 80 points. If another team also completes the maze in 40 seconds, but hits two walls, they will lose an extra 10 points, 5 for every wall. Their score will be 70 points.

**Team 1:** 120 - 40 = 80 points (1st place)    -    **Team 2**: 120 - 40 - 2(5) = 70 points (2nd place)

## Activity 2: Formula 1

The second activity is the Formula 1 race. Teams will be expected to race their robots around a track. The racetrack will be of unspecified distance. A black line will be drawn throughout the course using electrical tape approximately **2 cm wide**. The start and finish will be marked by a perpendicular line crossing the track line. See figure below.

For each race, two teams will place their robot on the track at the same time. Each team will have **30 seconds to set up** their robot. Once they press go, the robot should **wait 10 seconds before starting**. This will allow for the team captains to back away from the track. Each team will be allowed 3 attempts. The best time will be used to qualify for the semi finals.

In terms of **robot size**, the robot must be able to fit, with all parts fully extended, in a cylinder with a diameter base of 22 cm and a height of 22 cm. The robot cannot exceed a mass of 1000g. Non-Lego construction components are permitted..



## Activity 3: Performance Competition

The objective of the performance competition is to **program 1 to 3 maximum robots to perform together**. Students are welcome to perform with their robots as well. The performance can be no longer than **60 seconds (max 1 minute)**. The stage will be a flat rectangular area of around 4 m x 4m. The robots will be required to perform within it. Teams may provide background music on a USB key before their performance or they may opt to use their own speakers". **Teams are welcome to create their own scenery as a backdrop to their performance and accompany it with music or other sound effects.** The robots can be of any size or shape, but they must be autonomous after being manually started by the team. **Teams will be asked to present their performance concept and may have to explain their program.**



Teams will be judged based on:

- creativity,
- entertainment costume design and
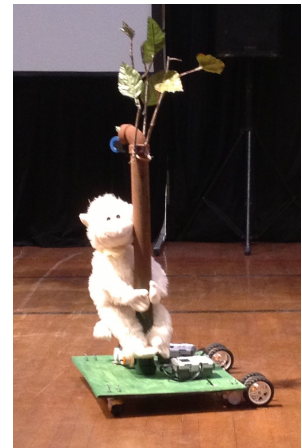
● programming skills.

Be as creative and entertaining as possible. Have lots of fun!


## Activity 4: ColourBots Sumo

The goal of the competition is for an autonomous robot to push its opponent(s) off the playing field.  A robot is considered eliminated when it does not move for more than 20 seconds, more than 50% of it's "body" crosses the border line, or it cannot return to the field. **The field will be approximately 150 cm from side to opposite side. The base of the field is white with a 4 cm black border along the perimeter (colours may be reversed)**. The size of the robot itself must be able to fit into a cylinder with a diameter base of 22 cm and a height of 22 cm, with all parts fully extended. The total weight cannot exceed 1000g.

The referee will randomly distribute color balloons (Red, Blue, Green or Yellow) 5 minutes before the start of the game. The robot will start on the edge with the color corresponding to the balloon they are given.

**Robots will receive points for pushing its opponents out of the playing field and staying the longest.** Every opponent a robot pushes out will receive a 5 point bonus.  The last robot to stay in the playing field will receive a 20 point bonus. The team with the most points will win the round and move on.  A robot is considered eliminated when it does not move for more than 10 seconds or cannot return to the playing field because it crossed the black border line. Play on!
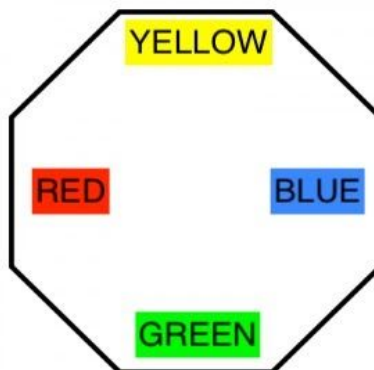


Sample judging rubrics will be provided before the competition.