

## MIND THE MINIONS

### Line Following Competition

#### Problem Statement

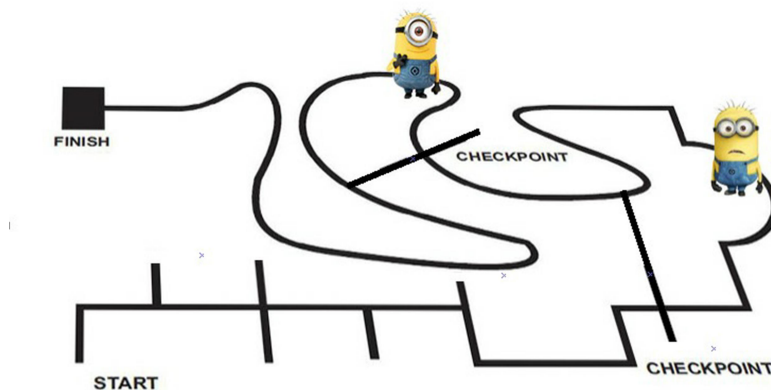
Gru has been known to be the greatest villain of all times. Now, he has taken retirement from all the villain business and hence, his life has become a little boring. To add a little excitement to his life, Dr Nefario (Gru's evil scientist) suggests Gru to organise a competition for all the new evil villains.

“Villains have to build an autonomous line following robot which can follow a black line and keep track of directions while going through the maze. The bot has to go through the maze from the starting point to the ending point in minimum possible time.”

Gru really likes this idea and becomes excited. So he calls upon his minions(Kevin, Bob, Stuart) to build a really challenging track, the minions also add some obstacles to this track to make it even more difficult. Villain, whose bot will reach the finishing line in the least time will be declared as the successor of Gru and the leader of all the minions.

#### Arena Specifications

- The arena consists of a continuous black line (3cm wide) on white background with numerous perpendicular line junctions.
- Note: The actual arena will be different from the one provided below.



## **Bot Specifications**

- Each team can have only one bot
- The bot must fit into a cube of side 24cm
- The bot must use only on-board power supply. No external off-board power supply is allowed
- The max voltage difference between any two points must not exceed 24V
- The bot must be fully autonomous with all powering and motoring mechanisms self-contained
- Human operators are not permitted to enter any information into the bot during the event. The bot must not communicate with any wireless device also.
- The bot must be started by only one switch. However, a team can have a separate switch for restart.
- The bot cannot be constructed using ready-made Lego kits or any ready-made mechanism. But you can make use of ready-made gear assemblies and sensors.
- Violating this clause will lead to the disqualification of the machine.
- There is no constraint on the weight of the bot.

## **Game Play**

- There will be just 1 run from start till end with a total of 3 checkpoints.
- There will be 2 obstacles throughout the track.
- 5 minutes of maximum time shall be allowed.
- The Led should glow at the end
- All teams will be given only one run with 3 restarts each with a particular time penalty.

## **Checkpoints**

- Checkpoint 1: 20 points will be awarded to the team when the bot reaches the first checkpoint.
- Checkpoint 2: 30 points will be awarded to the team when the bot reaches the second checkpoint.
- Checkpoint 3: 40 points will be awarded to the team when bot reaches the third checkpoint.



## **Pre-Game Setup**

- Each team will be allowed a slot of 2 min to calibrate their machines on a test track.
- The participant should tell the organizer whenever he/she intends to start.
- TEST ARENA: Just before the run, teams will get a chance to test their bots in the same lighting conditions at a smaller test track besides the main track.

## **Game Procedure**

- All the teams shall be provided with a queue number and each team must take its turn in the same order. No extra time shall be provided apart from the calibration time of 2 min.
- Each group shall be given maximum 2 minutes to calibrate their bot.
- The bot is to be started only when the organizers say so.

## **Rules**

- Only one autonomous bot per team is allowed.
- Reuse of bot is strictly not allowed.
- At the start of the run, the teams will have to keep the bot in the starting position.
- The bot is to be started only when the organizers say so.
- There would be only 3 restarts per team with a time penalty described in the table of judging and scoring below.
- At no point of time, any part of the bot can cross the boundary. If the bot crosses the boundary, the team will be declared out of the run.
- In case of draw i.e. two or more teams having the same run times, the team with minimum restart attempts will be given preference. If even then the draw exists, the decision of the judges shall be final.

## **General Rules**

- Organizers will not be responsible for any minor scratches left by the previous machines on the arena.
- Any team that is not ready at the time specified will be removed from the competition automatically.
- The machines would be checked for their safety before the run and would be discarded if found unsafe for other participants and spectators.
- Any machine which damages the arena will be disqualified.

- Participants should not dismantle their robots before the completion of the whole competition as the machines might need to be verified by the organizers at a later stage to ensure that the participants have not violated any of the rules.
- Organizers' decision shall be treated as final and binding on all. The organizers reserve the right to change any or all the above rules as they deem fit.

### **Judging and Scoring:**

<b>Points</b>	<b>Event</b>
10	LED
20	Checkpoint 1
30	Checkpoint 2
40	Checkpoint 3
-20	Obstacle 1 hit
-30	Obstacle 2 hit
-5	Restart 1
-15	Restart 2
-25	Restart 3
300-(time in seconds to finish)	Completing the track.

### **Team Specifications**

- Team may consist of a maximum of 4 members. Students from different educational institutes can form a team.
- All students with a valid identity card of their respective educational institutes are eligible to participate

### **Disqualification**

- Any bot not conforming to the specifications provided will be instantly disqualified.
- Any bot which damages the arena will be disqualified.

### **Certification Policy**

- Certificate of Excellence will be awarded to the top 3 teams.
- Certificate of Participation will be awarded to top 10 teams.
- Disqualified teams will not be considered for any certificates.