KAGA PROGRAMMING CHALLENGE 2026

Robot Line Challenge

Competition Rules

1. Competition Overview

In this programming competition, a robot travels autonomously along a black line to the turnaround point at the far end of the course, then returns to HOME to finish. Competitors review how their robot runs and adjust sensor values, motor control, and other settings to improve their program so that the robot runs more reliably and quickly.

The course difficulty varies for elementary school, junior high school, and high school students. The recorded score is the total of the points earned during the run and the bonus points awarded for the run time. Competitors aim to achieve one of three ranks - Bronze, Silver, or Gold - based on the number of successful finishes and their run times.

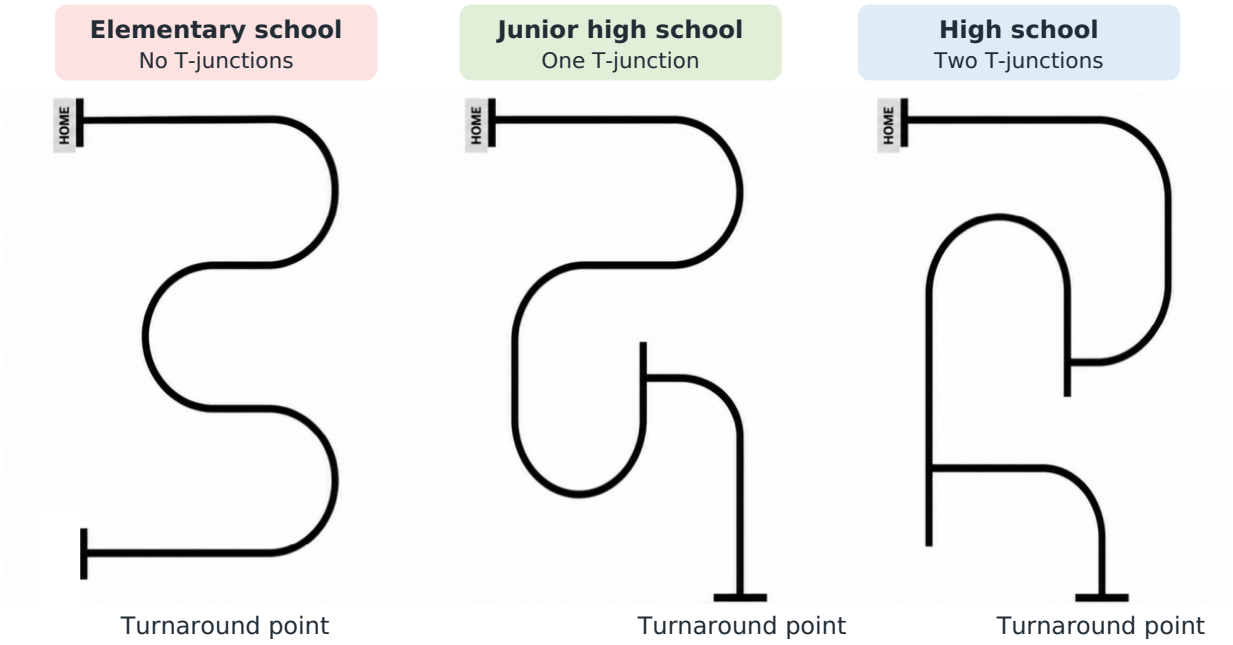
Unlike last year, there is no task involving carrying a ping-pong ball. The competition consists of one round trip.

2. Eligibility

- Elementary school students (a course with no T-junctions).
- Junior high school students (a course with one T-junction).
- High school students (a course with two T-junctions).

3. Course

- A black line is laid out on a white PVC mat measuring approximately 760 mm × 1,524 mm.
- The standard line width is approximately 1.25 cm for elementary and junior high school students and approximately 0.75 cm for high school students.
- The elementary school course has no T-junctions, the junior high school course has one, and the high school course has two.
- The course has HOME (start/finish) and a turnaround point.
- A wall is placed at the turnaround point. Physical contact with the wall is allowed.
- The actual line layout will be the course specified by the organizer.



Course examples

4. Robots and Check-In

Robots must comply with the following requirements.

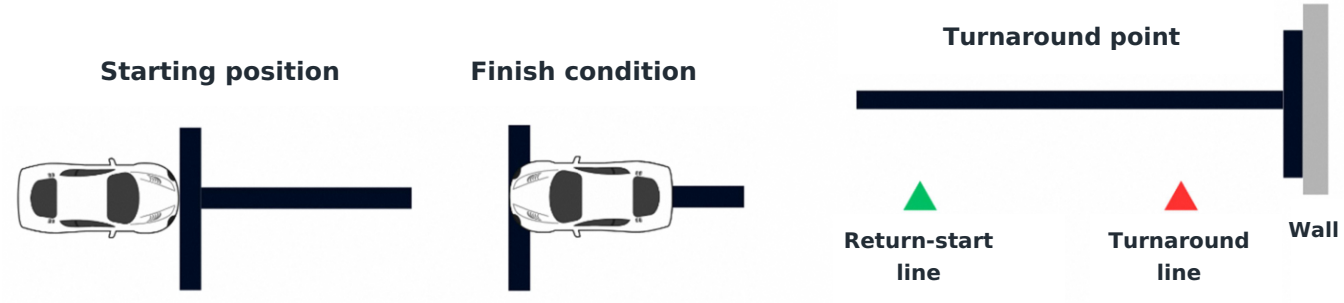
Item	Requirement
Platform	No restrictions
Robot type	**Autonomous.** The robot must run automatically under program control. Remote control using a controller or other device is not permitted after the start. A computer or tablet may be used to trigger the start.
Build cost	Approximately JPY 100,000 or less
Size	65,030 cm³ or less. The robot must not expand after it has been placed in the starting position.
Number of controllers	No restrictions (remote control during a run is prohibited)
Sensors	No restrictions on type or number
Motors	No restrictions on type or number

- Each team may use one robot in the competition.
- A spare robot may be used if the competition robot becomes unusable due to damage or another reason.
- Robots will be checked for compliance at the competition. A robot that does not meet the requirements may not be allowed to compete.

5. Rules and Scoring

- Complete the course within the two-minute time limit.
- Each team may make up to 10 scored attempts. The team's final score is the sum of its five highest scores.
- Points are awarded for passing designated locations, such as straight sections, T-junctions, and the turnaround point.
- Within the time limit, competitors may restart from the starting position as many times as they wish.
- The attempt ends and the score is tallied if the robot leaves the course, cannot continue running, is touched, is judged unable to continue by the referee, or if the competitor declares that they give up.
- Shortcuts through areas without a line are prohibited.
- Programs must perform line following. Failure to do so results in disqualification.
- If the robot completes the course within two minutes, the whole-number part of the time remaining in seconds is added as bonus points.
- At the start, position the robot with its foremost point aligned with the T-shaped end line at HOME. The robot's foremost point means its frontmost part, whether or not that part touches the ground.
- A wooden wall is placed at the turnaround point. Physical contact with the wall is allowed.
- The turnaround line is 10 cm before the turnaround point. When the robot's foremost point crosses this line, the robot is considered to have reached the turnaround point and points are awarded. Contact with the wall is not required.
- The return-start line is 40 cm after the turnaround. When the robot's foremost point crosses this line, the robot is considered to have successfully started its return journey and points are awarded.
- Stickers marking the turnaround line and the return-start line will be placed where they do not interfere with line following.
- After making the U-turn, the robot finishes when its foremost point crosses the T-shaped line at HOME. The robot has not finished if its foremost point has not crossed that line.
- At a T-junction along the course, a turn is considered successful and points are awarded when the robot turns and begins moving onward. Leaving the course while turning or turning in the wrong direction counts as a failure.
- The referee decides whether the robot has left the course, passed each scoring point, or finished, and determines the run time and other results.
- If a situation not covered by these rules arises, the referee will make a decision with safety and fairness in mind.
- The organizer may pause the competition if necessary for the conduct of the event or to ensure safety.

Start, finish, and turnaround



Scoring table

Division	Leave HOME	Turn at 1st T-junction (outbound)	Turn at 2nd T-junction (outbound)	Reach turnaround point	Begin return journey	Turn at 1st T-junction (return)	Turn at 2nd T-junction (return)	Finish
Elementary school	50	-	-	150	200	-	-	300
Junior high school	25	50	-	150	200	250	-	300
High school	25	50	75	150	200	225	250	300

The points in this table are cumulative scores for reaching each location. The base score for completing the course is 300 points.

For a completed run, the score for that scored attempt is 300 points plus the whole-number part of the time remaining in seconds.

6. Rank Certification

Sum of the five highest scores

Rank	Elementary school	Junior high school	High school
Bronze	1,000 points or more	1,000 points or more	1,000 points or more
Silver	1,300 points or more	1,300 points or more	1,300 points or more
Gold	1,600 points or more	1,650 points or more	1,700 points or more