



RobotChallenge - Unknown Mission Junior Group Rule

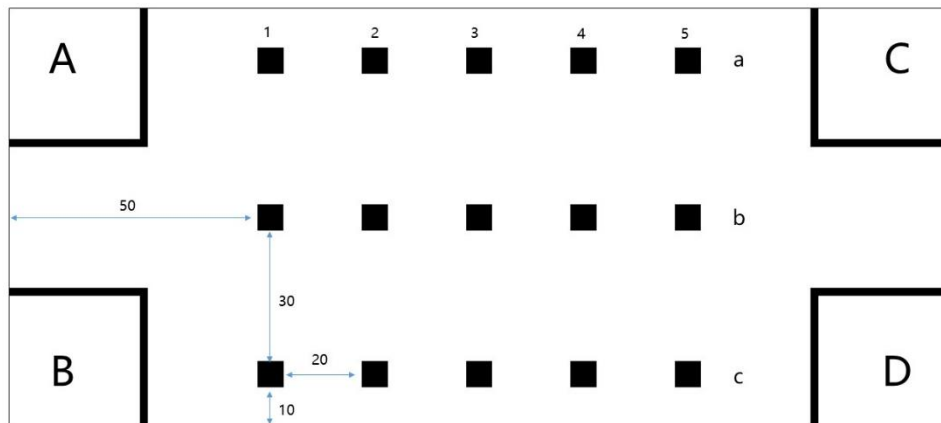
Introduction: Publish multiple competition tasks in the form of a question bank before the game, and release one of the tasks as a competition before debugging for the on-site competition. The starting area and extra point tasks for each question will be announced before debugging. The unknown factor of random strategic objects is randomly placed by the referee during live competitions.

1. Venue setting

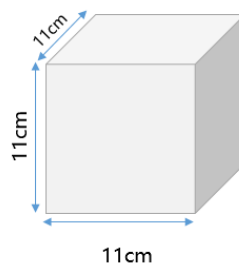
1.1 Site dimensions

- A. Venue size: 180cm long and 80cm wide.
- B. The competition stage is a wooden stage, the surface is covered with car stickers, the corners of the stage are at right angles, the height of the stage is about 10cm, and there is a black stage below the stage.

1.2 Stage layout



- A. Space size in areas A, B, C and D (not including black line): 25cm*25cm, black line width is about 15mm.
- B. Black square size in the venue: 5cm*5cm.
- C. The dimensions in the site map are measured from the center of the square.
- D. There is an error within 3 mm in site layout dimensions.
- E. The venue strategic items are square cartons, weighing about 35-55g, black or white. The size of the strategic object is approximately 11*11*11cm as shown below.





2. Robot requirements

2.1 Robot specifications

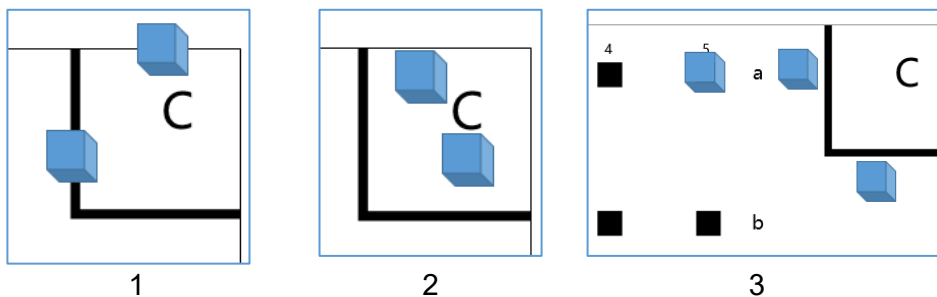
- A. The size of the robot is 25cm*25cm, with no height limit. It can be expanded after the robot is started.
- B. Robots are not limited to equipment, such as LEGO NXT, EV3, Spike, VEX IQ, Zhongming, Whale, Ability Storm, etc.
- C. The robot is limited to one controller, sensor, and motor, as long as they are harmless to the human body.
- D. Robot program ideas, no limit on quantity. All programs need to be downloaded to the robot in advance.

2.2 Competition robot requirements

- A. During the competition, the team will bring the complete machine and the mechanical structure required for the task.
- B. According to the tasks issued by the competition venue, on-site debugging and modification of the complete machine.

3. question bank

- A. All four areas A, B, C, and D may be used as startup areas.
- B. The start-up area and extra-point tasks will be announced during on-site debugging. The placement of random strategic objects for each task will be done randomly by the referee at the beginning of each round for each team.
- C. Scope of extra-point tasks: strategic object position display, calculation data display, and robot stay area at the end of the game.
 - i. Randomly place 5 strategic objects in rows a and c ($1 \leq$ strategic objects in each row ≤ 4). The robot starts from the starting area, carries the strategic objects to any two areas ($1 \leq$ strategic objects in each area ≤ 4), and Display the number of strategic objects in two areas (such as C1, D4 or B3, D2). The position determination of strategic objects is shown in Figures 1, 2, and 3.



Part of Figure 1 is projected in the correct position

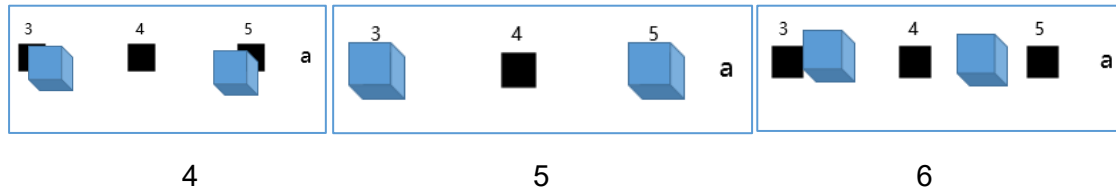
Figure 2 Correct location

Figure 3 Wrong location



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- ii. Place a strategic object each in a1, a5, c1, and c5, and randomly place a strategic object in rows 2-5 of b. The robot starts from the starting area, measures the distance from the strategic object in row b to the position b1, and displays the distance on the screen. (such as 40cm) and the position number of the strategic objects in row b (such as b3), move the strategic objects in rows a and c so that the distance between the two strategic objects in each row is the same as the measured distance. The position determination of strategic objects is shown in Figures 4, 5, and 6.



Part of Figure 4 is projected in the correct position

Figure 5 Correct location

Figure 6 Wrong location

- iii. Randomly place 5 strategic objects in rows a and c ($1 \leq$ strategic objects in each row ≤ 4). The robot starts from the starting area and moves 5 strategic objects to one row (can be any row of a, b, c), and displays the number of strategic objects in rows a and c (such as a2, c3 or a4, c1). The position determination of strategic objects is shown in Figures 4, 5, and 6.

The location of strategic objects is determined after the game ends, based on whether the pre-requisite tasks have been completed. If not, all strategic objects except those that fell onto the stage will be scored in the wrong position.

4. Detailed rules of the competition

4.1 Game times and times

- There are two rounds in the competition, which are conducted continuously. The highest score will be obtained in the two rounds.
- In each round, the score will be looked at first. If the scores are the same, the remaining time will be looked at. The one with more time remaining will be ranked higher.
- Each round is 2 minutes long.

4.2 Game start

In the robot starting area, the players place the robot and signal to the referee that the preparation is complete. The referee announces the start of the game and the players start the robot.

4.3 competition is over

- During the competition, if the robot falls onto the stage or the robot does not move for a long time, the competition will end, the remaining time will be 0, and the total score will be totaled.



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- B. When the game termination task is completed, the referee stops timing and records the score and remaining time.

4.4 competition rules

- A. The competition debugging time is 120 minutes. At the end of the debugging, inspection and isolation will be carried out.
- B. Before the robot sets off, its size cannot be larger than 25cm*25cm.
- C. Before the game starts (the robot has not started), if there is a problem with the robot, you can apply to the referee for adjustment. Adjustment time is 5 minutes. Failure to play after the adjustment time will be deemed as a forfeit.
- D. After the game starts, if the robot fails to start (does not leave the starting area), the team members can adjust the robot and start again, but the timer will not stop. If the robot completely exits the starting area and touches the robot with your hand, the game will be deemed to be over.
- E. Teams may request a full reset (with penalty points) at any time after the game begins. If you choose to reset, the time will continue to count and the referee will reset the stage props.
- F. All tasks must be completed autonomously without any outside assistance.
- G. Final scoring occurs at the end of the game.



Unknown competition junior group score table

project		numerical value	Point Value	Score Earned/Lost
#1	Strategic object location	in the right position	0 1 2 3 4 5	10
		Partially projected in the correct position	0 1 2 3 4 5	5
		in the wrong location	0 1 2 3 4 5	3
#2	show tasks	Correct display (allowable error range for numerical display is ± 5 cm)	0 1 2	10
		wrong display	0 1 2	3
#3	strategic object	Strategic objects fell off the stage	0 1 2 3 4 5	-2
#4	Bonus points tasks	Complete extra points tasks	0 1 (no) (yes)	25
#6	The robot remains intact throughout its operation		0 1 (no) (yes)	5
#7	Reset (reset penalty)		0 1 (no) (yes)	-3
			Total Score	
			time left:	