



BEST IQ Challenge Rules

31 August 2022

In collaboration with our national partner



Contents

- Section 1 BEST IQ Challenge 3
 - 1.1 Description of the Challenge..... 3
 - 1.2 Schedule..... 3
 - 1.3 Participation Criteria 3
 - 1.4 How to Find My Cody ID 4
 - 1.5 Getting Started Solving 6
 - 1.6 Scoring..... 7
 - 1.7 Leaderboard/Rankings & Awards 8

Section 1 BEST IQ Challenge

BESTIQ Challenge is a national challenge open for any individual student that tests a student's knowledge in a wide variety of science and engineering skills. What is your BEST IQ?

1.1 Description of the Challenge

The BEST IQ Challenge combines questions from mathematics, science and engineering with software coding using Mathworks MATLAB.

- A series of problems are presented to be solved by the participant.
- Each problem is solved by coding a MATLAB function that successfully passes the Test Suite provided with the problem.
- A Test Suite may be one or more pairs of stimulus and expected response. Your function must generate a response matching the expected response for each of the stimulus conditions.
- Points are awarded for each problem successfully solved. Bonus points are awarded for achieving badges.
- A leaderboard displays the points and badges accumulated by all participants at any given time during the challenge period. The leaderboard updates every 30 minutes.

1.2 Schedule

1. BESTIQ Challenge will run for 11 weeks, starting Saturday, September 10, 2022, and ending Saturday, November 26, 2022, midnight.
2. Students may participate anytime during this period and at any pace they choose.
3. This is a national level challenge open to anyone (with a BEST national registry account). Only students will be included on the BEST IQ Leaderboard.

1.3 Participation Criteria

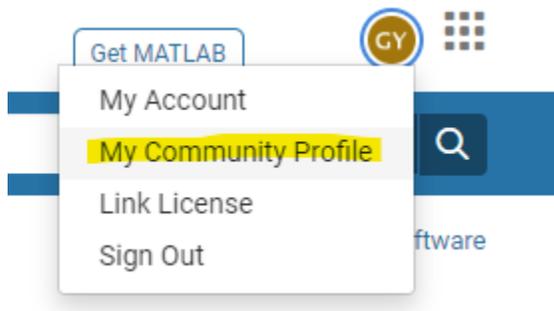
1. Every person participating must first have a Mathworks account. If you do not have an account, create your Mathworks account at <https://www.mathworks.com/login>. You will need a valid email address. The email address will never be visible to others.
2. Every person participating must also have a BEST National Registry account. All students participating must have a [student login for the BEST National Registry](#). If you do not have such a login, talk with your teacher or mentor regarding creating one. Parents authorize the teacher/mentor to provide online access to their child during the student registration process.
3. Student participants must enter their Cody ID on their BEST National Registry profile to become visible on the leaderboards. Any student that does not provide a Cody ID will NOT be considered for awards. See the "[How to Find My Cody ID](#)" section for the exact steps required.
4. There is no limit to the number of students on a team that can participate each week.
5. Each student can work at his or her own pace.

1.4 How to Find My Cody ID

To get your name on our leaderboard and to be eligible for awards, you will need to follow these steps to update your Mathworks community profile nickname AND provide BEST with your unique Cody ID number.

STEP 1: Update your Mathworks community profile with your BEST National Registry avatar name:

1. Login to <https://www.mathworks.com> using your MathWorks account credentials. If you do not already have an account, you will need to create one to participate.
2. Navigate to the [BEST IQ Challenge page](#) on the Mathworks Cody platform.
3. Students, click on your profile icon and select “**My Community Profile**”.



Then select the “**Edit your Profile**” link on your community profile page.



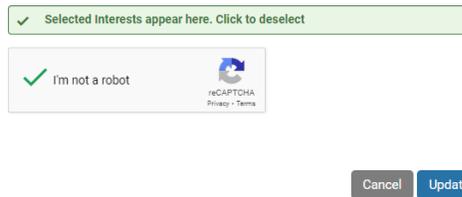
4. Enter your BEST National Registry avatar name in the “**Matlab central nickname**” field of this profile page. Be aware that this nickname will be the name listed on the leaderboard. The email address does not need to change and it is never shared publicly.

An asterisk (*) indicates a required field.

Matlab central nickname*	<input type="text" value="JohnnyBGood"/>
Email address*	<input type="text" value="greg.young@capitol-best.org"/>
	<input checked="" type="checkbox"/> Allow users to contact me securely ⓘ

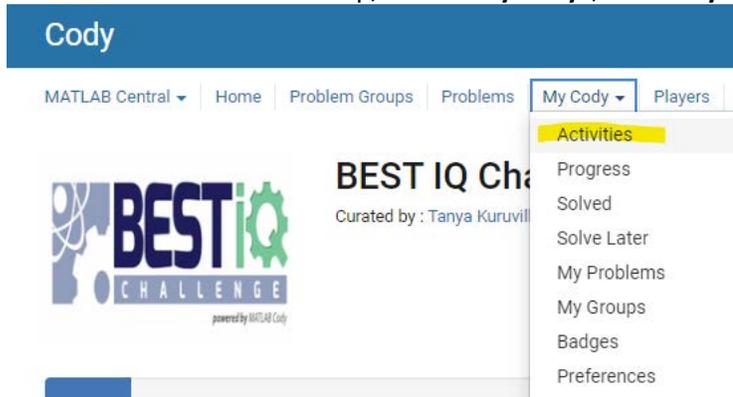
No other information on the profile requires updating.

Check the Captcha box and click the Update button at the bottom of your profile.

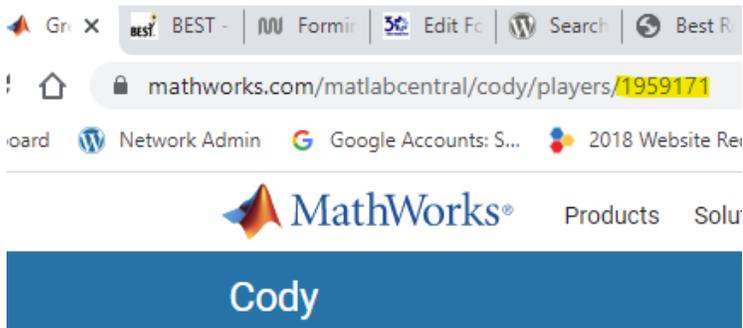


STEP 2: Now locate your unique Cody ID:

- In the menu bar across the top, select “My Cody”, then “My Activities”.



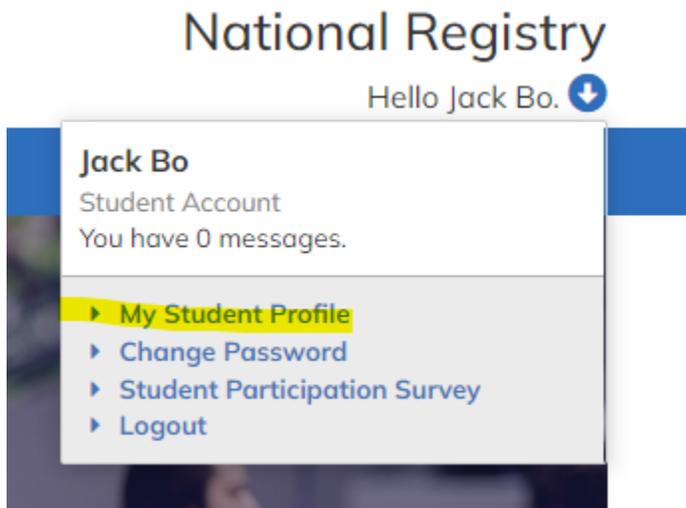
- Now copy the URL address showing in your browser.



- Your Cody ID is the number shown at the end of this URL address.

STEP 3: Add your name to the BEST IQ Challenge Leaderboard:

- Login to the [BEST National Registry](https://registry.bestrobotics.org) using your registry credentials provided by your teacher (which are different than your Mathworks account) at <https://registry.bestrobotics.org>.
- Navigate to your user profile by clicking on the arrow next to your name in the upper right of the screen and selecting My Profile.



10. Add your Cody ID in the appropriate profile field on the registry profile page.

Mathworks Cody Id

11. After the Cody ID is added to your registry profile, you will officially become a contestant and your name will show up on the BEST IQ Challenge Leaderboard.

1.5 Getting Started Solving

1. Participants login to the [BEST IQ Challenge](#) on the Mathworks Cody platform with their Mathworks account credentials. Students, note that these credentials will be different than your BEST National Registry account credentials.
2. The BEST IQ Challenge is set up as a Private Group within the Mathworks Cody platform. Only BEST participants will have the URL so results will be limited to students in our program. Cody is a much larger community-based game environment. To find out more about using Cody, visit <https://www.mathworks.com/matlabcentral/content/cody/about.html>.
3. Sixty (60) total problems will be provided. You may work on problems in any order on any time schedule you choose within the start/end dates for this challenge.
4. To understand how to develop and submit a solution to a problem, visit [Cody Help - Solve Problems](#).
5. Unlocking (and viewing) solutions

- a. Cody calculates a size for each solution. When you submit a correct solution to a problem, you can see other solutions of the same size (that is, the same length or longer), but not shorter solutions.
- b. Each time you solve a new problem, you unlock all solutions to your previously solved problems in the same group (BEST IQ Challenge).
- c. Use the [solutions map](#) to view the unlocked solutions to the problem(s).

1.6 Scoring

1. The problems presented will vary in complexity. They are listed in no specific order. The difficulty is rated by those who solve the problem.
2. A community rating system is employed to give participants some insight into the difficulty of each problem. Each problem can be rated as easy, medium, hard in level of difficulty by those who solve the problem. As a participant, you can rate each problem after you solve it. You will find the current rating (easy, medium, hard) for the problem at the top of the problem page.



Difficulty: ●○○ (3192)

3. Regardless of the rated level of difficulty, each problem solved is worth 10 points.
4. For each problem solved, a solution bonus up to 20 bonus points is awarded for the relative “size” of your solution with respect to other participants. If you have the best solution, you will receive all 20 bonus points. If all solvers have equivalently sized solutions, you receive 0 bonus points. If your solution falls somewhere in the middle of the pack, you will receive a relative percentage of the 20 bonus points.

We determine where your solution size falls within the current minimum and maximum solution sizes of all solvers of the problem. This normalized value then determines what percentage of the 20-point Leader bonus you receive for your current solution. You CAN improve your solution with another submission to increase your solution “standing” and increase the bonus. You can also lose bonus points as better solutions are submitted by others.

5. Badges are earned for reaching certain levels of activity. One-time bonus points are awarded for earning badges. The badges (and their point values) are shown in Table 1.

Table 1. BEST IQ Challenge Badges

What badges can I earn?	How can I earn this badge?	Bonus Points Awarded
Solver	Solve your first problem.	10

What badges can I earn?	How can I earn this badge?	Bonus Points Awarded
Leader	Solve a problem with the best solution. The badge is awarded the first time Leader status is achieved, even if that status changes later.	20
Speed Demon	Solve a problem before anyone else.	50
IQ Champion	Solve all the problems in the BEST IQ Challenge	50

- The total score accumulated by each participant (as indicated on the BEST IQ Leaderboard) at the end of the challenge will be their final score for determining ranking and awards.

1.7 Leaderboard/Rankings & Awards

- Every player will see their score and ranking updated on the BEST IQ leaderboard (see Figure 1) within 30-minutes after they solve a problem. The leaderboard updates every 30 minutes. Detailed solutions and explanations for each problem will be posted to a participant’s Team Workflow AFTER the challenge ends.

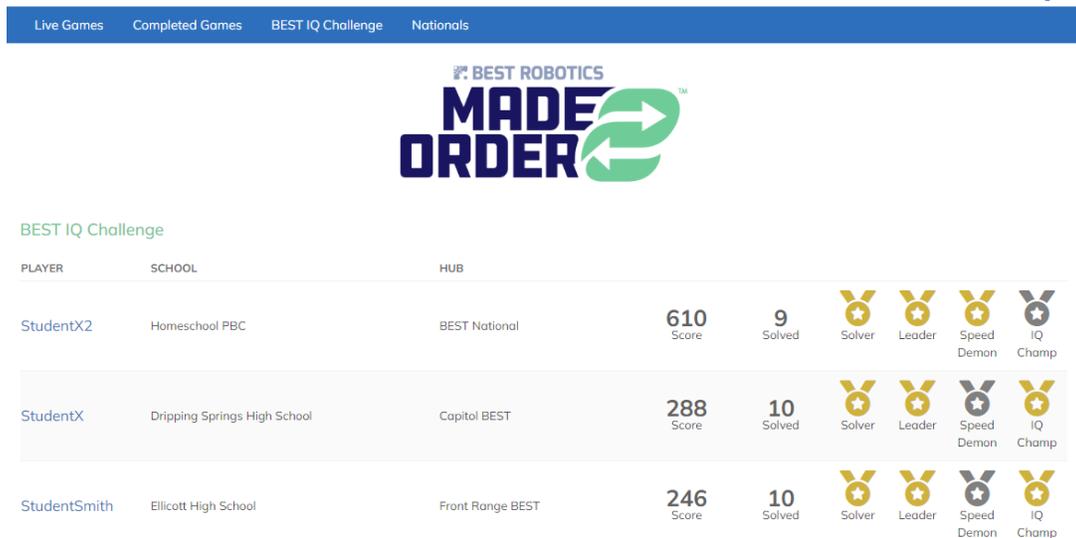


Figure 1. BEST IQ Challenge Leaderboard

- Badges are awarded for participants reaching predetermined point thresholds over time. The badges encourage week to week participation. See an explanation of the possible badges in Table 1.
- NOTE that the badges and points (Badges & Solved) shown through the My Cody menu will NOT reflect the exact BEST IQ Challenge score as Cody accumulates points and badges across all

activities and BEST IQ Challenge is calculating your scores only on problems in the IQ challenge only based on the rules stated in this document. The BEST IQ Challenge also includes a solution bonus based on the size of your solution, which Cody does not (See section 1.6 item 4).

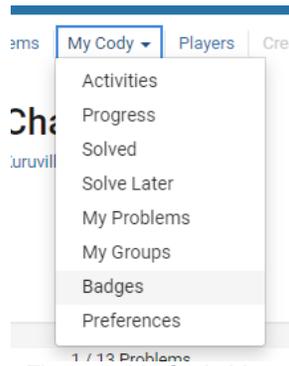


Figure 2. My Cody Menu

4. The BEST IQ leaderboard is publicly viewable at any time. Use the link from your Team Workflow page to access the leaderboard. Feel free to share the link with others. Access the leaderboard directly at:
<https://game.bestrobotics.org/leaderboard/iq>
5. National awards and recognition will be provided to the students with the top 3 scores (among all participants) in the final leaderboard rankings.
6. The top 10 students on the leaderboard at the conclusion of the challenge will receive Mathworks swag.