

ENJOY AI 2024
INTERSTELLAR JOURNEY

CLOSING CEREMONY OF SPORTS

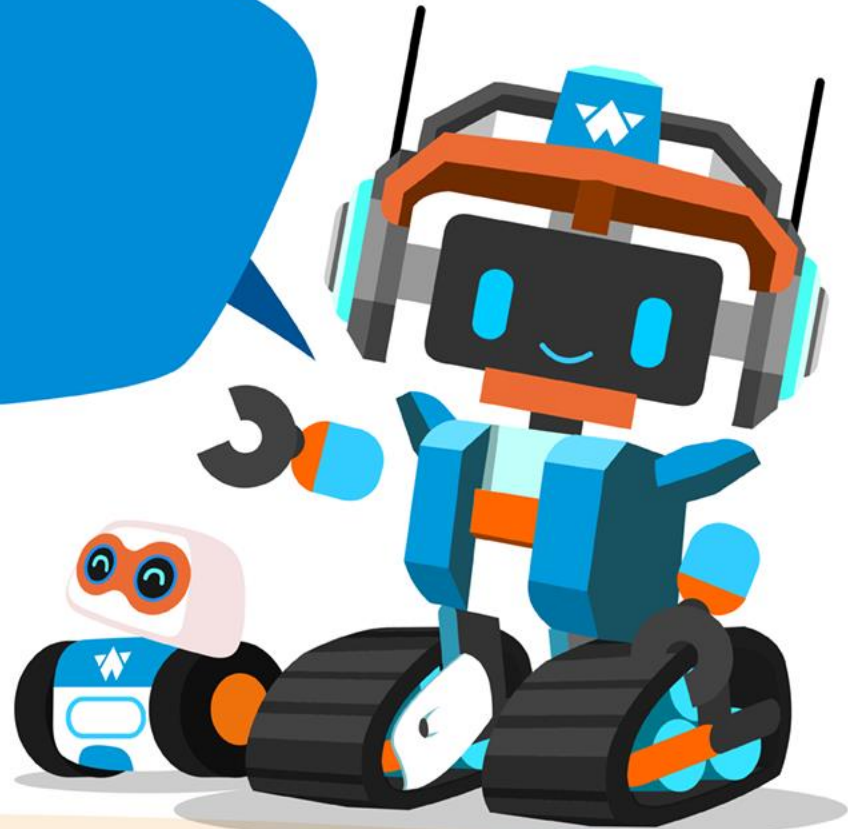


Task Analysis (Part 2)

Objectives:

1. In-depth analysis of task requirements and scoring rules
2. Design solutions
3. Write programs to finish the tasks

5+



Review



We have finished two of the eight tasks in the previous lesson.
Now, let us go on with other tasks!



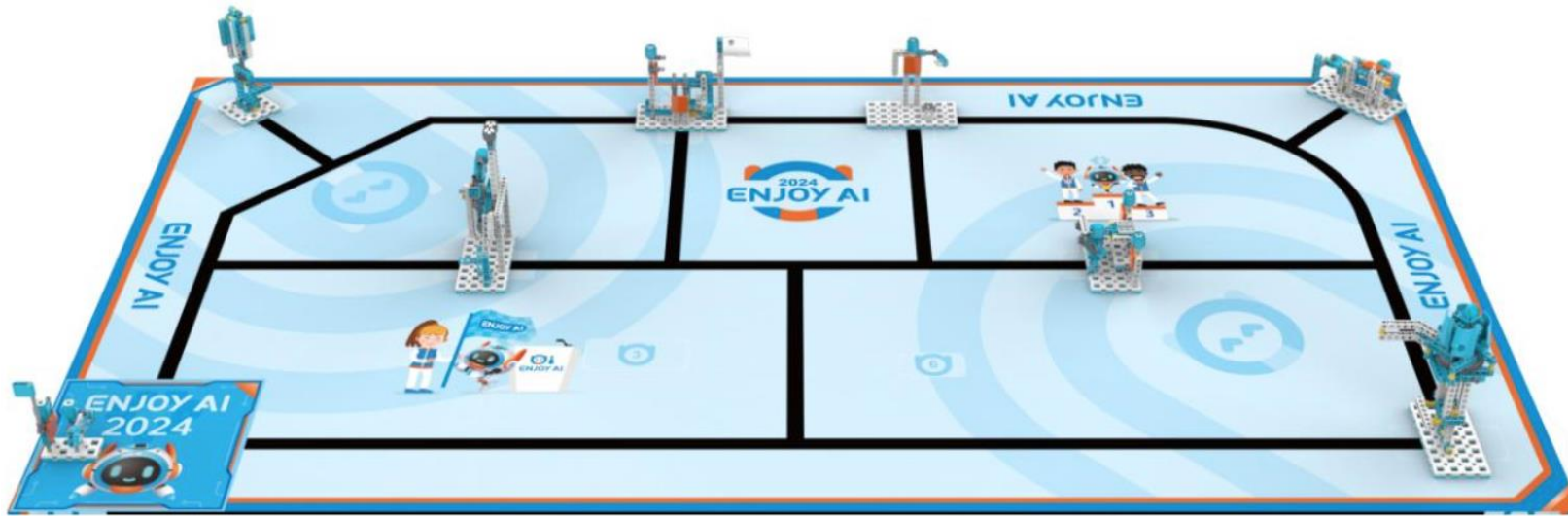
Review

1. In the previous lesson, how did the robot move to the designated areas and carry things along with it?
2. How did the robot make turns? In coding, when do we need to use code blocks in the “motion” category and when to use those in the “patrol line” category?

Challenges



Challenges



In this lesson, we'll learn the other two tasks:
closing speech and flag handover.



Challenges



To watch detailed rule analysis, go to
<https://www.youtube.com/watch?v=oitiXwSqGBM>

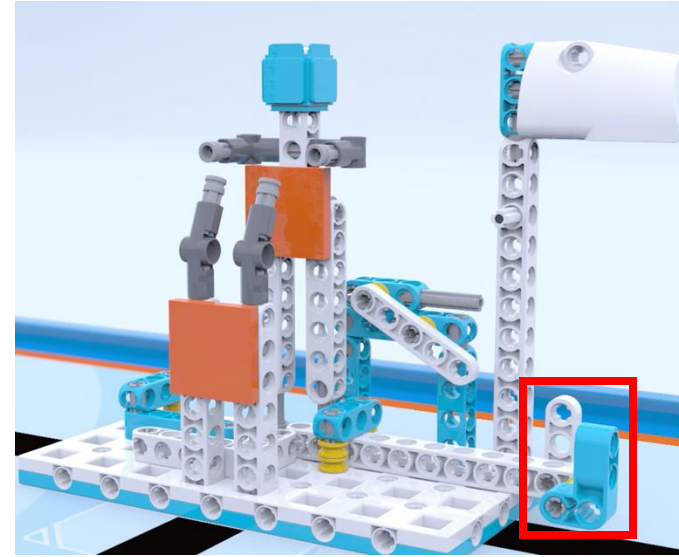
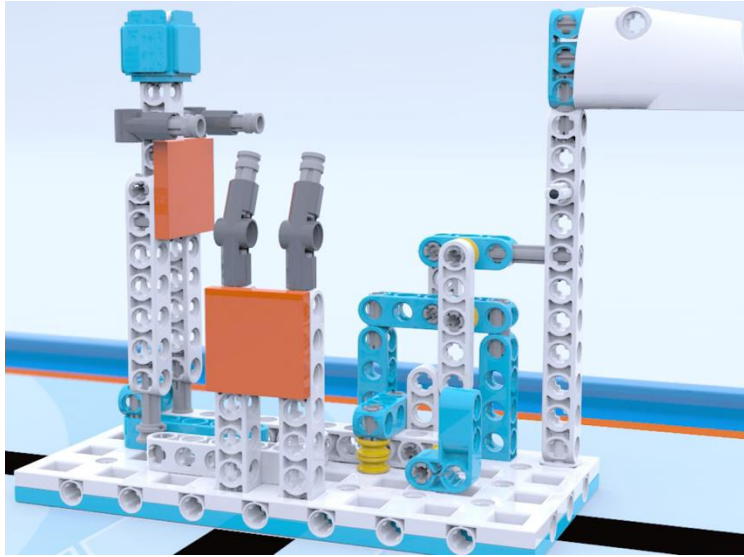
To watch a demo, go to
<https://www.youtube.com/watch?v=jn6KJHc9a2E>



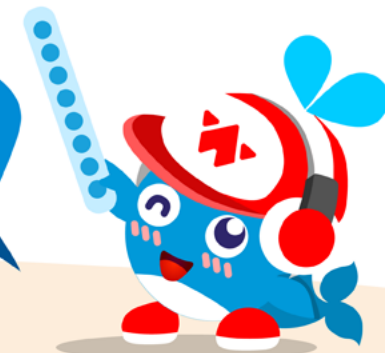
Task Analysis: Closing Speech



Challenges



As shown in the previous video, we need to pull the toggle to let the speaker stand behind the microphone.

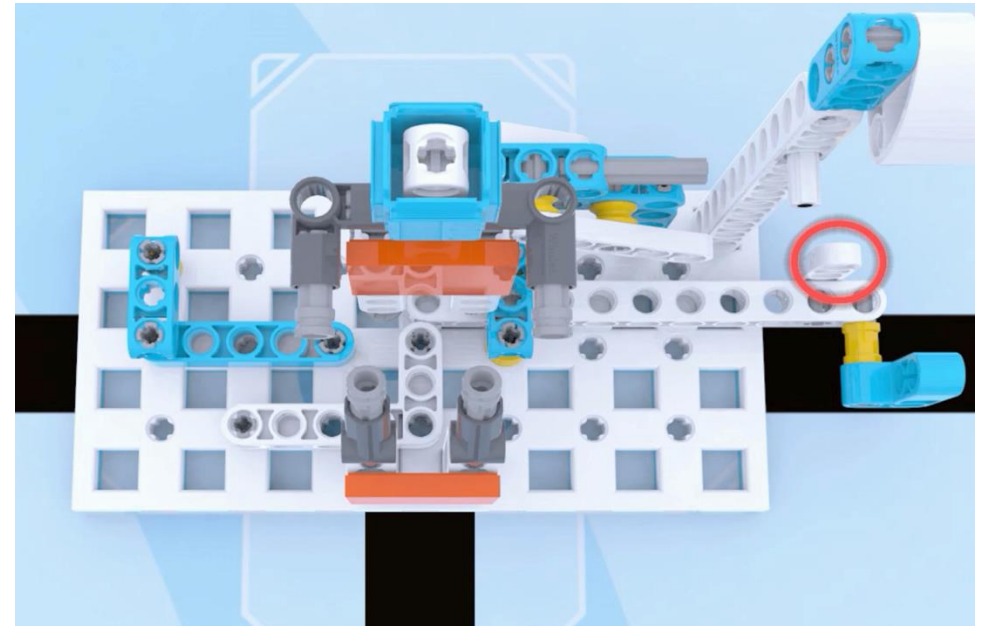
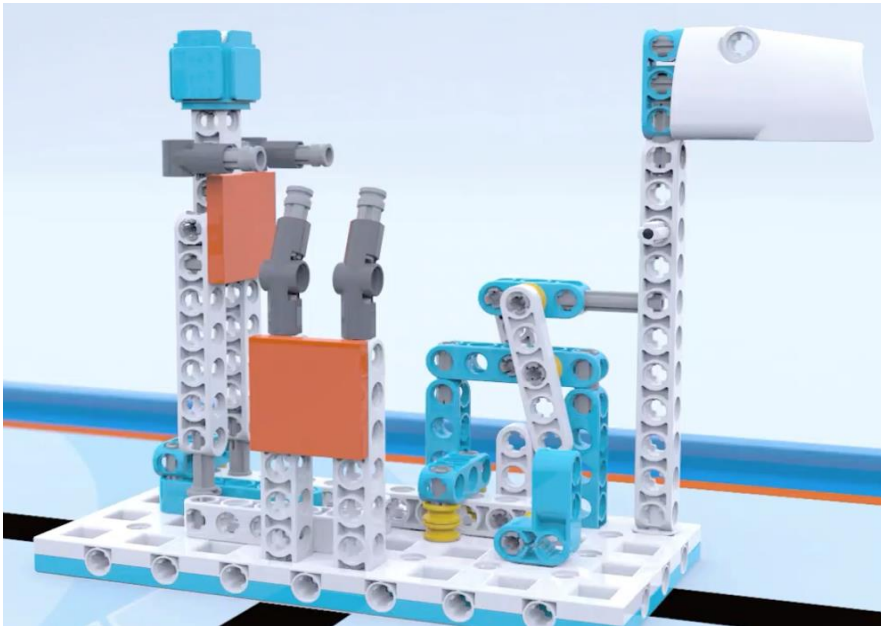


Challenges



Everyone, before we start practicing this task, let's learn how to win points in this task!

Challenges



You earn points if the top-down projection of the 30 single beam does not touch the bottom plate.

Challenges



So, how can we build our robot? What parts do we need?

Challenges

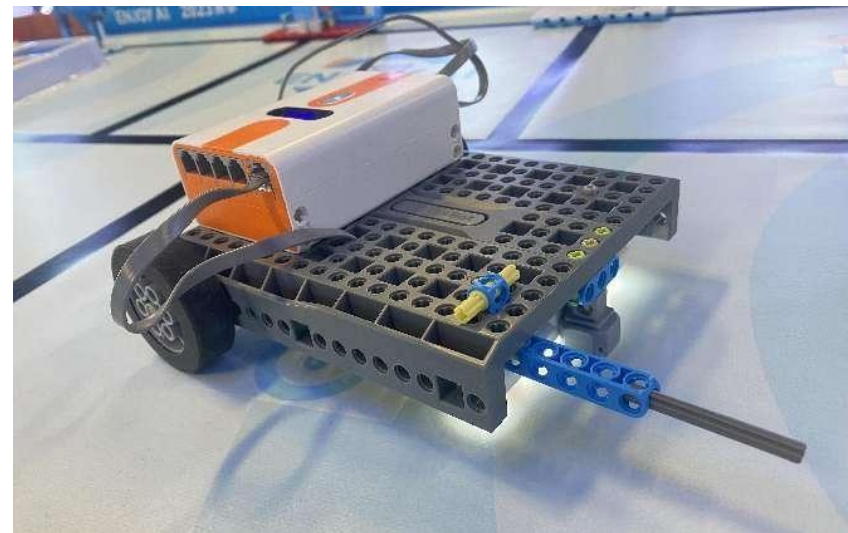
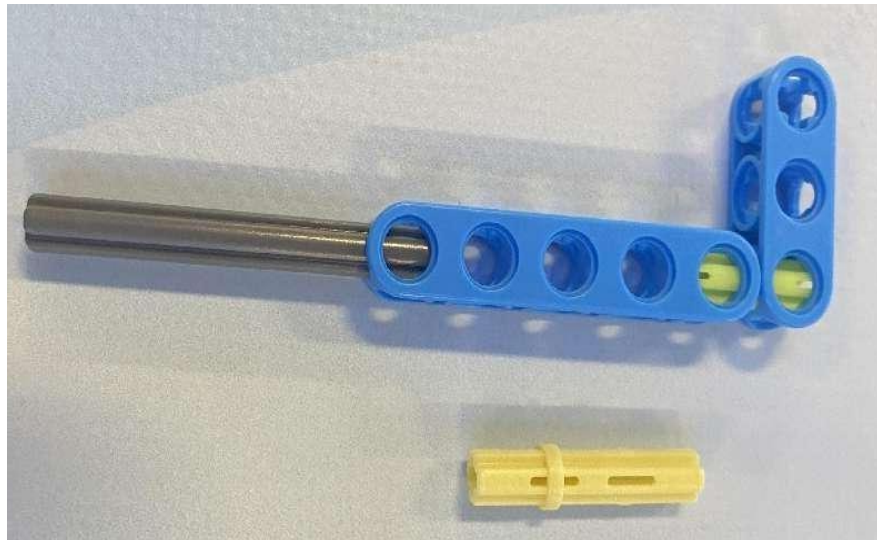


We need a structure like this to let our robot pull things. Let your imagination run wild and see whose design is better!

Give it a try!

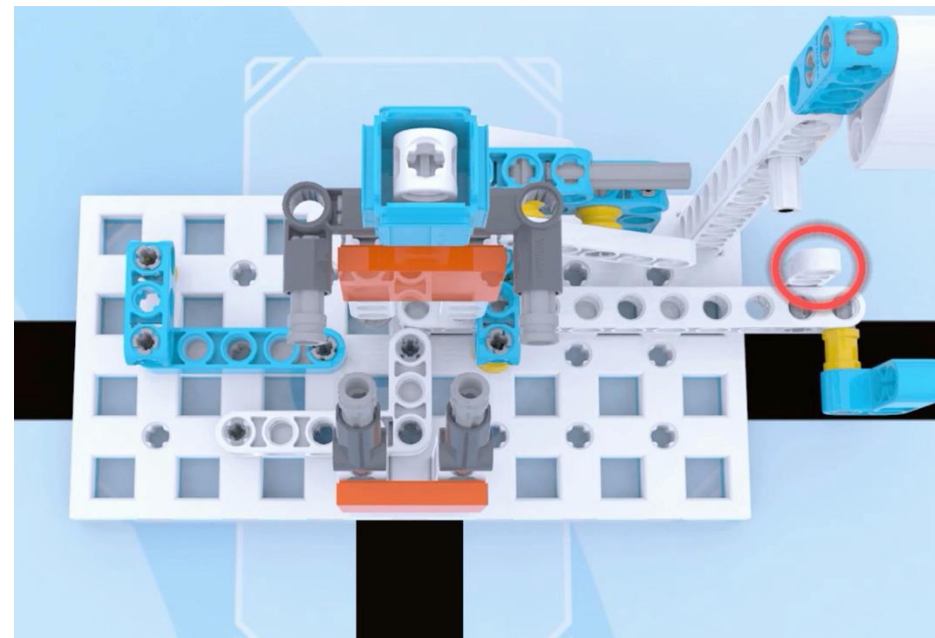
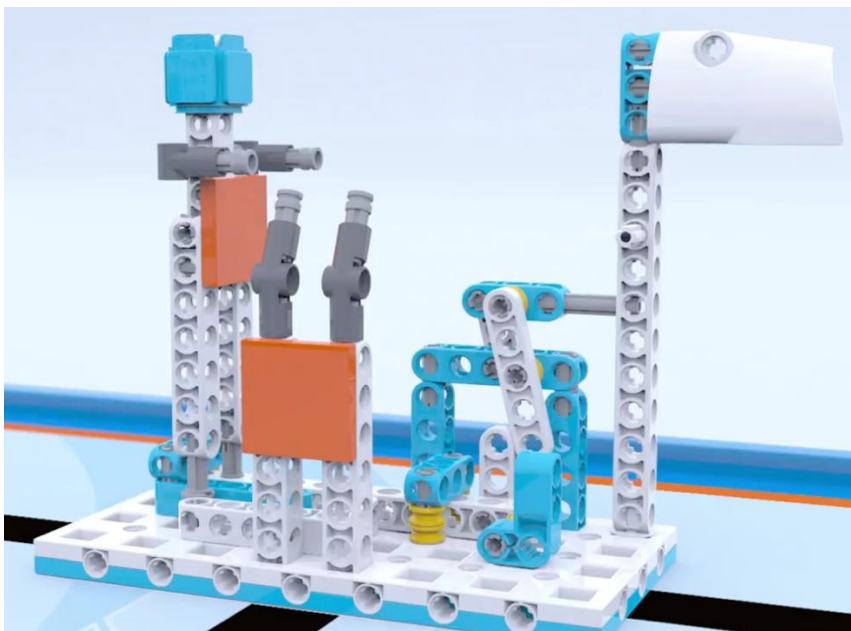


Challenges



Here's our solution. Let's build this one!

Challenges



Try to write a program to complete this task!

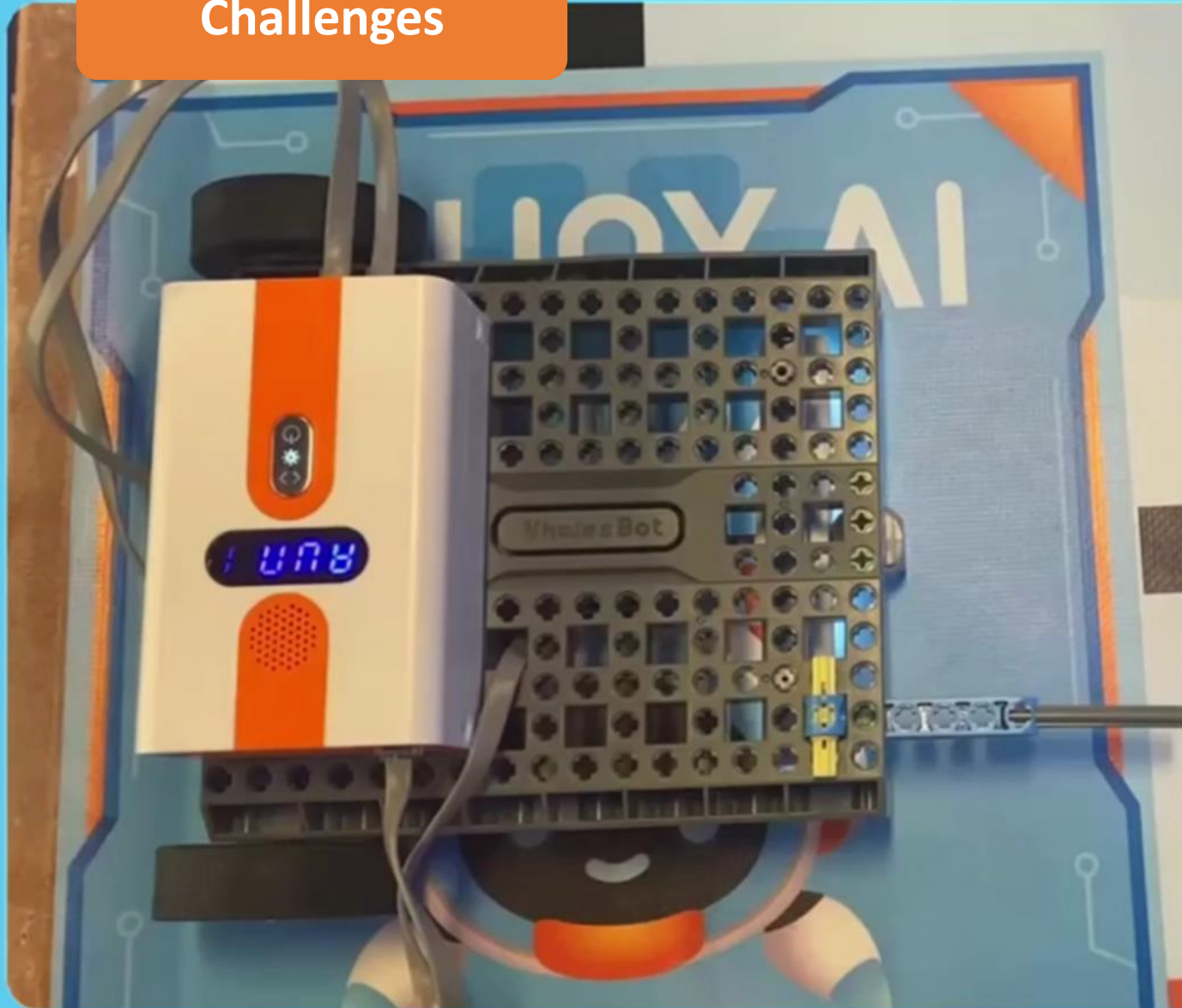
Challenges

The following video provides a demo of this task.



Challenges

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Challenges

```
main
initialize left motor A 100 right motor B -100 integrated grayscale port 5
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
wait 0.2 secs.
turn middle left motor speed -30 right motor speed 30
wait 0.2 secs.
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
wait 0.2 secs.
turn middle left motor speed -30 right motor speed 30
wait 0.2 secs.
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
wait 0.2 secs.
turn middle left motor speed 30 right motor speed -30
wait 0.2 secs.
patrol line patrol line speed 20 for 1.3
move left motor A right motor B Turn right power 40 % run for 0.3 secs.
```

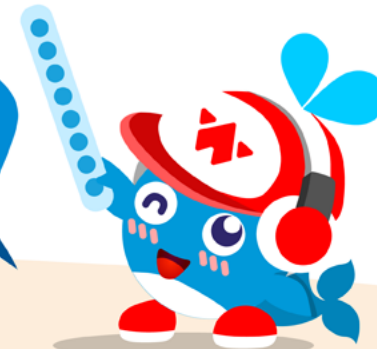
Sample Program

Challenges

Challenges accepted!



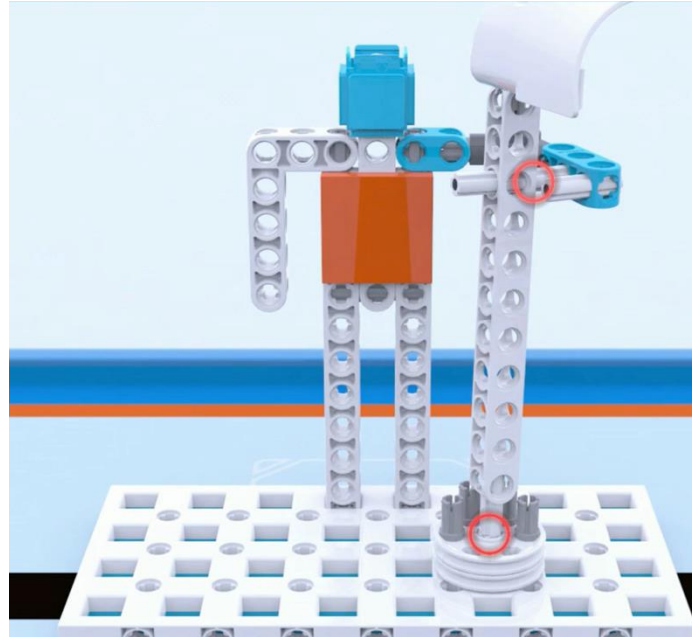
Congratulations! You have done this task! Let's go on with the next task!



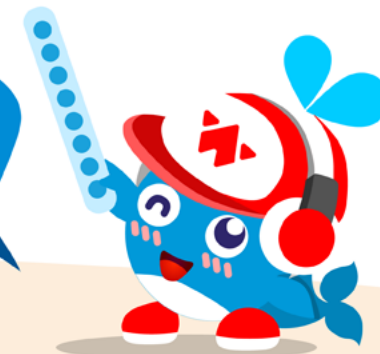
Task Analysis: Flag Handover



Challenges



As shown in the previous video, the robot needs to send the flag to the specified area and make the magnets marked in the red circles attracted.

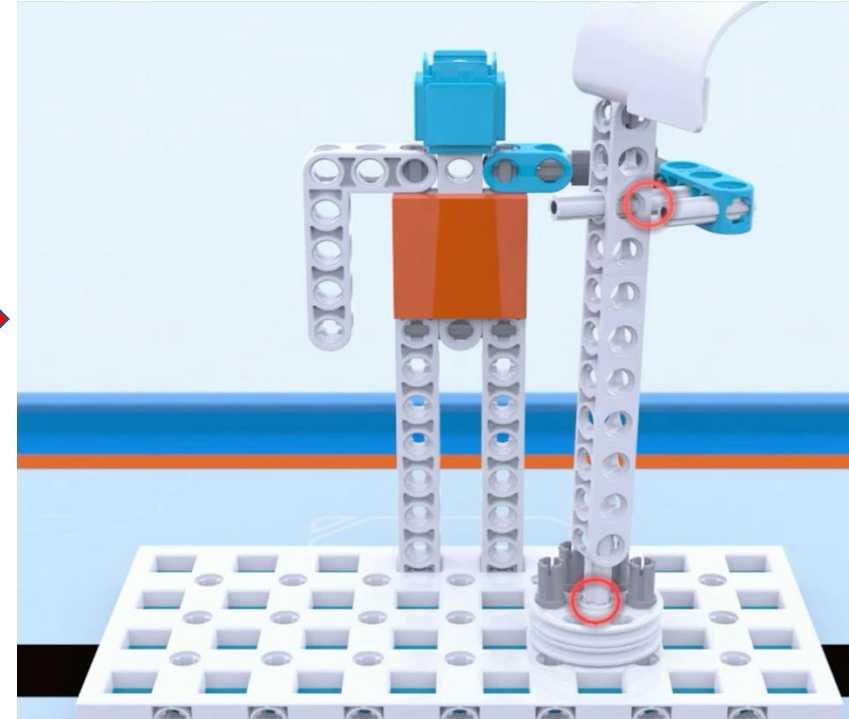
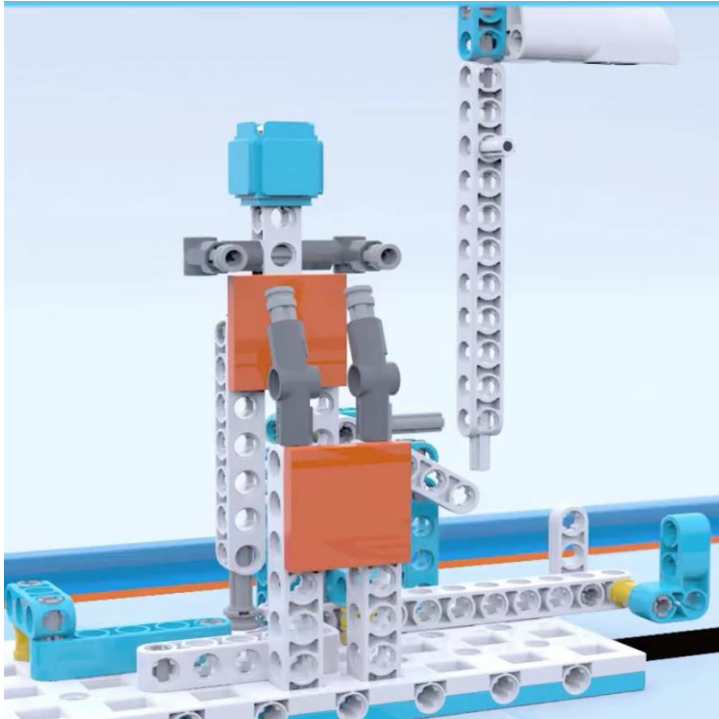


Challenges



Everyone, before we start practicing this task, let's learn how to win points in this task!

Challenges



We need to move the flag from the area in Picture 1 to the area in Picture 2, and we need to ensure that the upper and lower magnets are attracted.

Challenges



So, how can we build our robot? What parts do we need?

Challenges

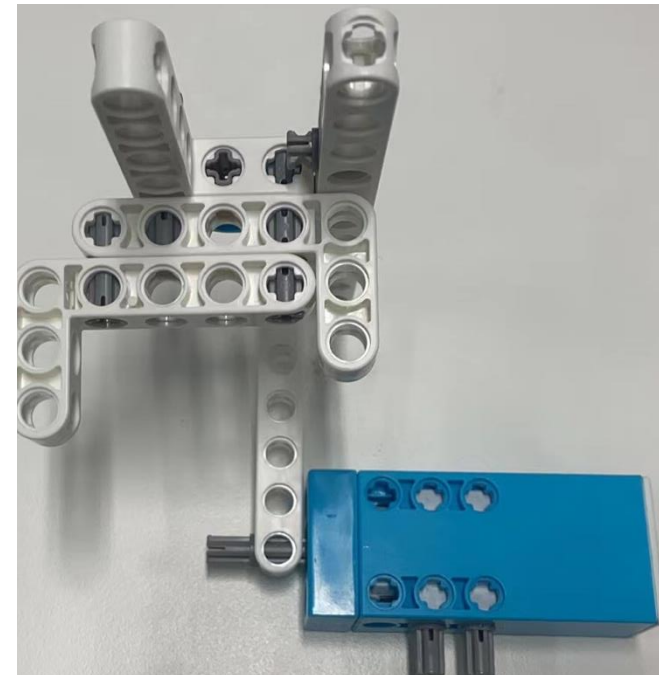
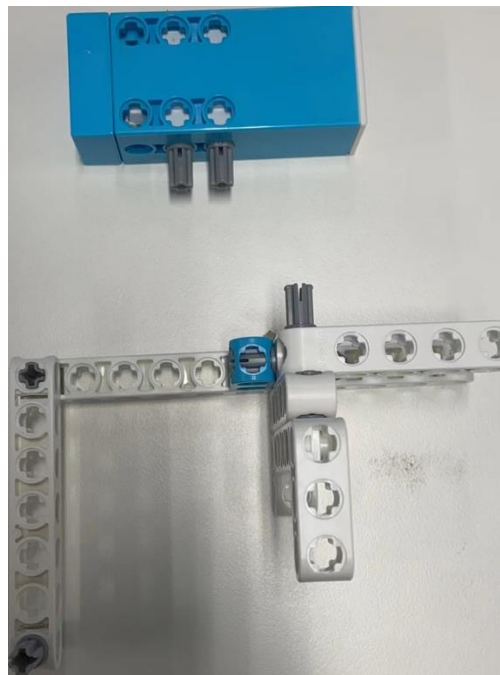
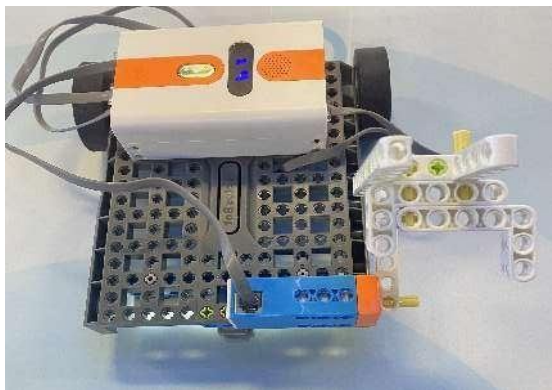


To do this task, the robot needs to lift, move, and then put down the flag. So, we need a structure that helps lift things up and put things down.

How can we build a thing like that?

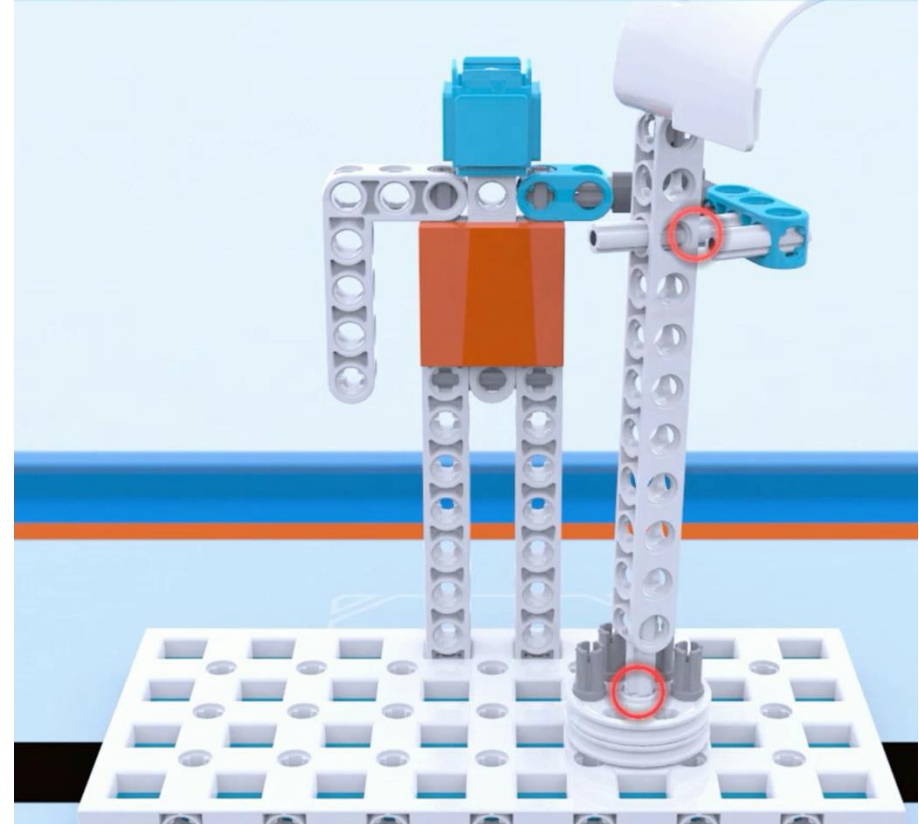
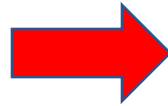
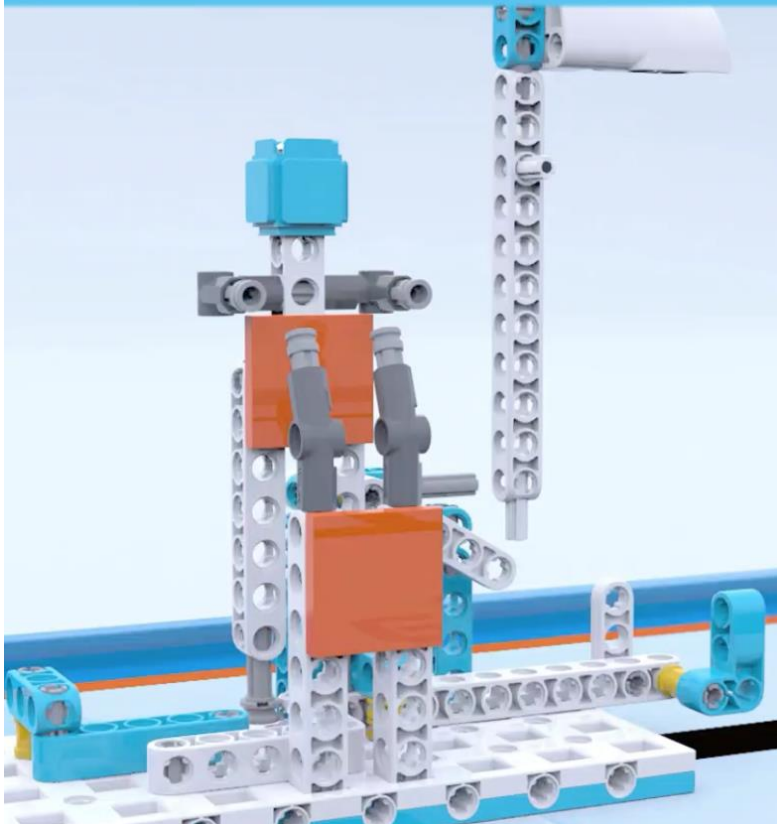


Challenges



Here's our solution. Let's do it!

Challenges



Try to write a program to complete this task!

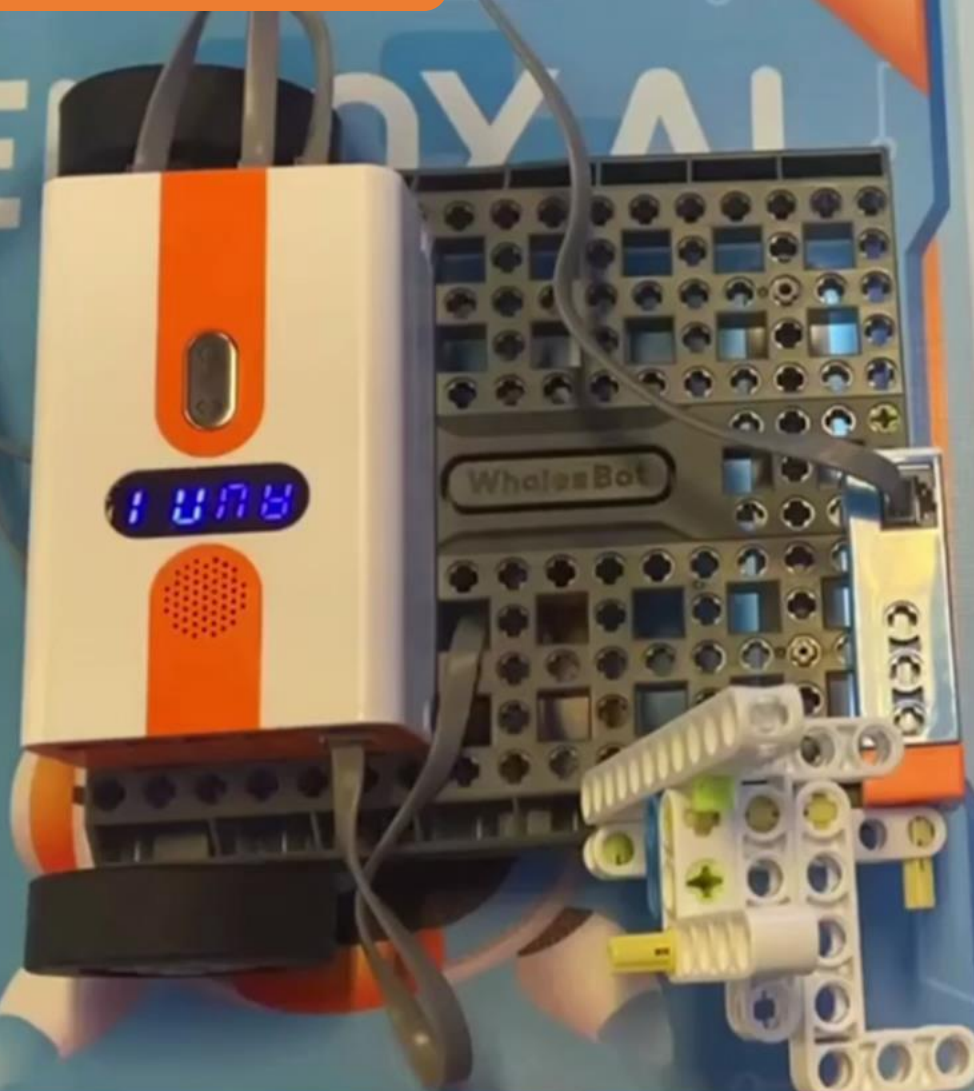
Challenges

**The following videos provide demos
of this task.**

The first video shows how to lift the flag.
The second video shows how to put down the flag.

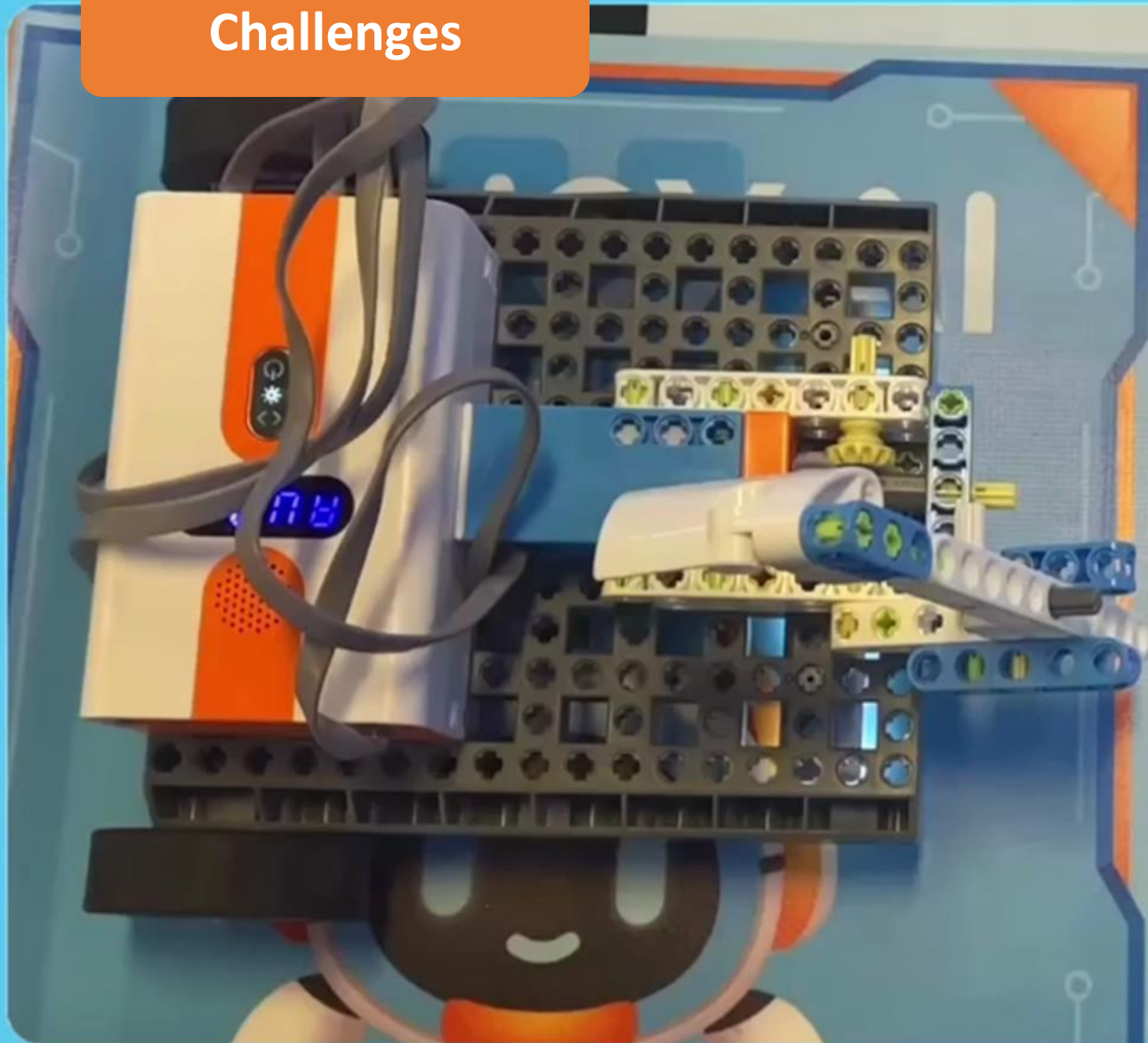
Challenges

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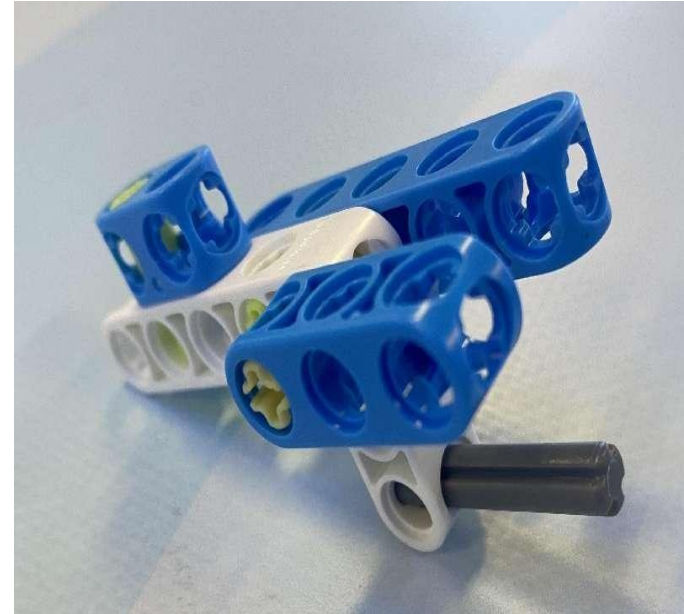
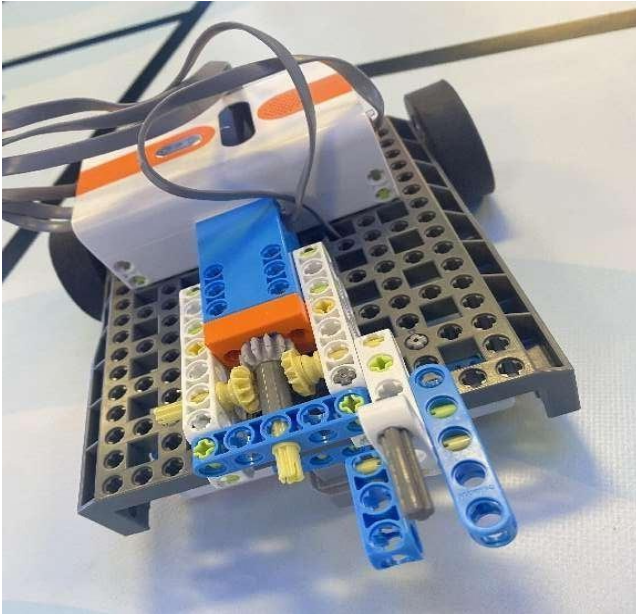


Challenges

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Challenges



Here's our design. Let's do it!

Challenges

Sample Program (Part 1)

main

```
initialize left motor A 100 right motor B -100 integrated grayscale port 5
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed -30 right motor speed 30
set motor D power -15 % run for 0.32 secs.
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed -30 right motor speed 30
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed 30 right motor speed -30
patrol line patrol line speed 30 for 0.5
move left motor A right motor B Turn right power 40 % run for 0.1 secs.
patrol line patrol line speed 20 for 1
wait 1 secs.
set motor D power 15 % run for 0.3 secs. Lift the flag
wait 1 secs.
move left motor A right motor B Backward power 20 % run for 0.1 secs.
wait 1 secs.
```

Return to the base

```
turn middle left motor speed 10 right motor speed -10
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed -30 right motor speed 30
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed 30 right motor speed -30
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed 30 right motor speed -30
patrol line patrol line speed 30 for 2.5
```

Challenges

Sample Program (Part 2)

main

```
initialize left motor A 100 right motor B -100 integrated grayscale port 5
start motor left motor speed 30 right motor speed 30 time 0.5
patrol line intersections left patrol line speed 30 rush through intersection time 0.05
turn middle left motor speed -15 right motor speed 15
patrol line intersections right patrol line speed 30 rush through intersection time 0.05
turn middle left motor speed 15 right motor speed -15
patrol line intersections left patrol line speed 30 rush through intersection time 0.2
turn left left motor speed -30 right motor speed 30
patrol line patrol line speed 10 for 2.7
start motor left motor speed 10 right motor speed 14 time 0.4
set motor D power -10 % run for 0.2 secs. Put down the flag
```

Return to the base

```
wait 0.5 secs.
start motor left motor speed 10 right motor speed 10 time 0.1
wait 0.5 secs.
start motor left motor speed -20 right motor speed -20 time 0.5
turn middle left motor speed -30 right motor speed 30
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed 30 right motor speed -30
patrol line intersections left patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed -30 right motor speed 30
patrol line intersections right patrol line speed 30 rush through intersection time 0.1
turn middle left motor speed 30 right motor speed -30
patrol line patrol line speed 30 for 3
```

Challenges

Challenges accepted!



Great! You've finished two tasks today. Let's spend the rest of the time practicing the two tasks and see if we can finish them more quickly!

Try it out!



Let's try to finish these two tasks and then let the robot return to the base!



See you next time!

