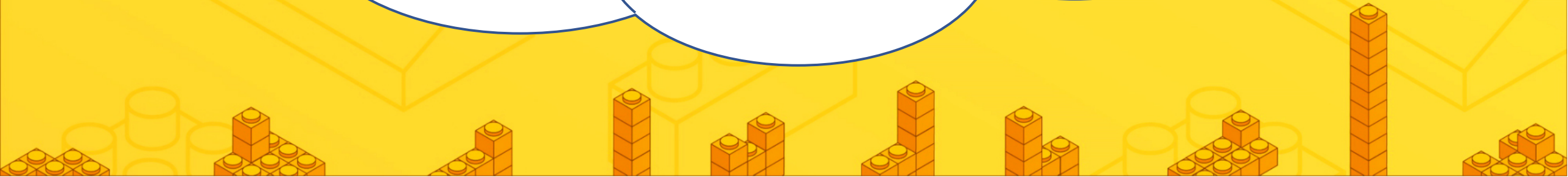




Troubleshooting

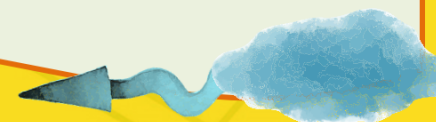


Target

- Learn the rules of troubleshooting in Task 3.
- Based on what you have learned, use dual grayscale line-following, object detection, and other functions to complete the content of Task 3.



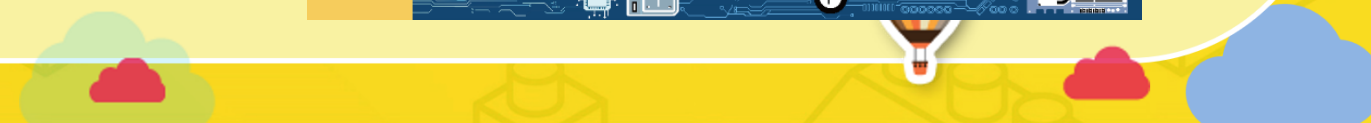
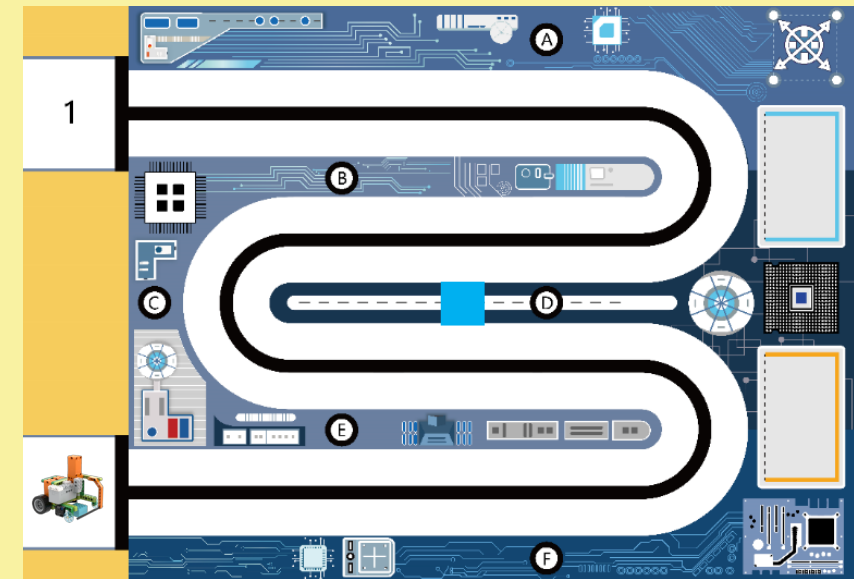
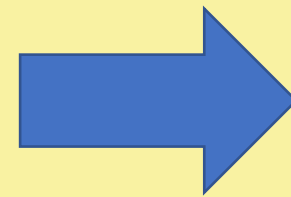
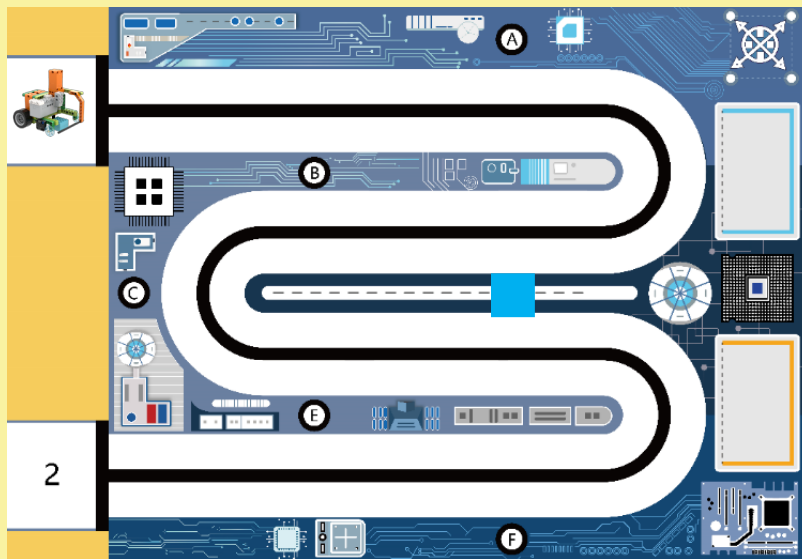
01 Task





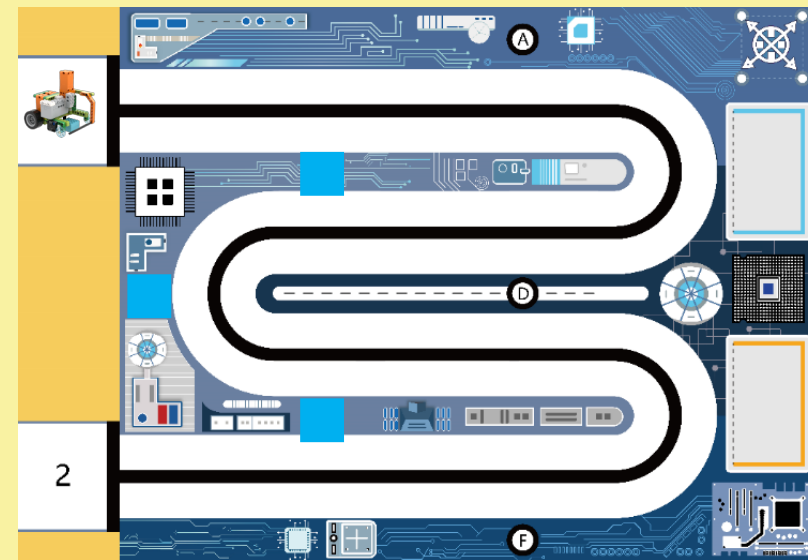
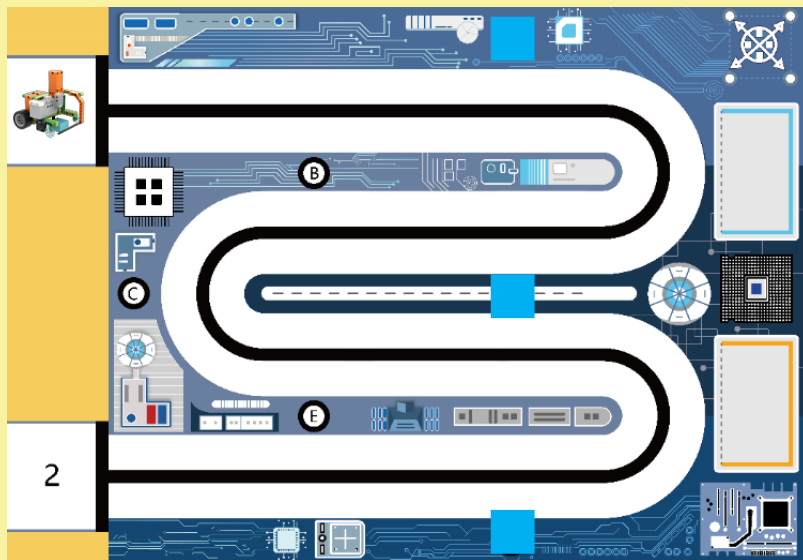
Task

- The smart device starts from the black line at Position 1 and follows the black line (fiber optic line) back to the preparation area.
- At the start of the competition, a task object will be placed at one of the ABCDEF positions, and the smart device needs to push the task object away, which is considered detecting a problem with the fiber optic line.
- For example, in the diagram below, an obstacle is placed at Position D.



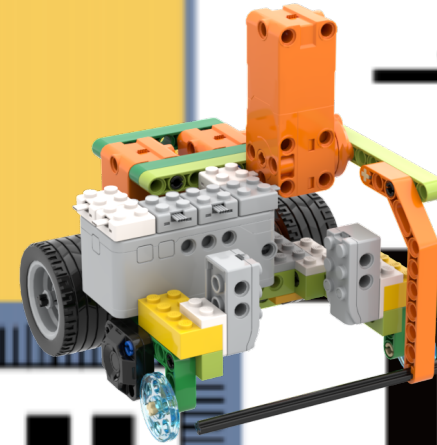
Task Analysis

- First, confirm the orientation of the color sensor based on the placement of the fault blocks.
- At points ADF, the color sensor should face left; at points BCE, the color sensor should face right.



Task Segmentation

Task 1: Move out from the starting point and complete the line-following task.



Move forward to leave the starting point first, then start the line-following action.

Task

Referrable program

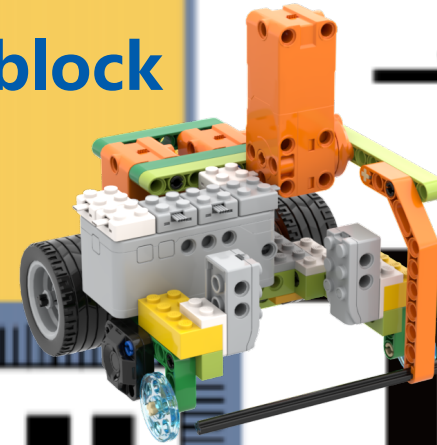
```
define line
  if 1# single channel line tracker's value < 23 then
    if 2# single channel line tracker's value < 23 then
      set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
      set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
    else
      set 1# ext servo to keep running at 0 (-100~100)% power on clockwise
      set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
    else
      if 2# single channel line tracker's value < 23 then
        set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
        set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
      else
        set 1# ext servo to keep running at 0 (-100~100)% power on anticlockwise
        set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
```

```
when clicked
  set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
  set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
  wait 1 seconds
  forever
    line
```

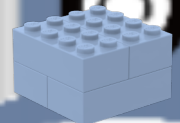


Task Segmentation

Task 2: During line-following, detect the fault block and remove the fault block at Point C.



Use the color sensor to detect the block.





Task

Referrable program 1

First, stop when the block is detected.

```
define line
  if < 1# single channel line tracker's value < 23 then
    if < 2# single channel line tracker's value < 23 then
      set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
      set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
    else
      set 1# ext servo to keep running at 0 (-100~100)% power on clockwise
      set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
    else
      if < 2# single channel line tracker's value < 23 then
        set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
        set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
      else
        set 1# ext servo to keep running at 0 (-100~100)% power on anticlockwise
        set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
```

```
when clicked
  set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
  set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
  wait 1 seconds
  repeat until < 1# color sensor's color code < 50
  line
  stop all ext motor(s)
```

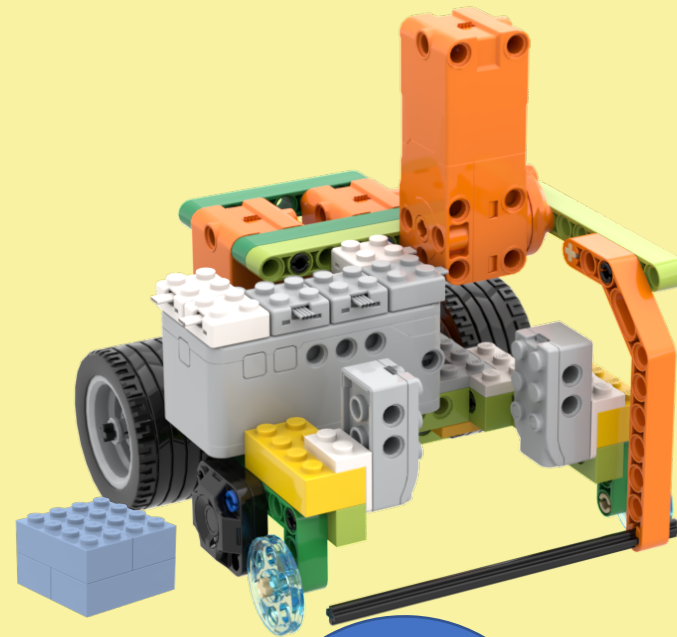




Task

After detecting the block, the robot only needs to perform a turning action to clear the fault, then continue line-following.

Complete the fault clearance.



```
set 1# ext servo to keep running at 50 (-100~100)% power on anticlockwise
set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
wait 2.5 seconds
stop all ext motor(s)
```





Task

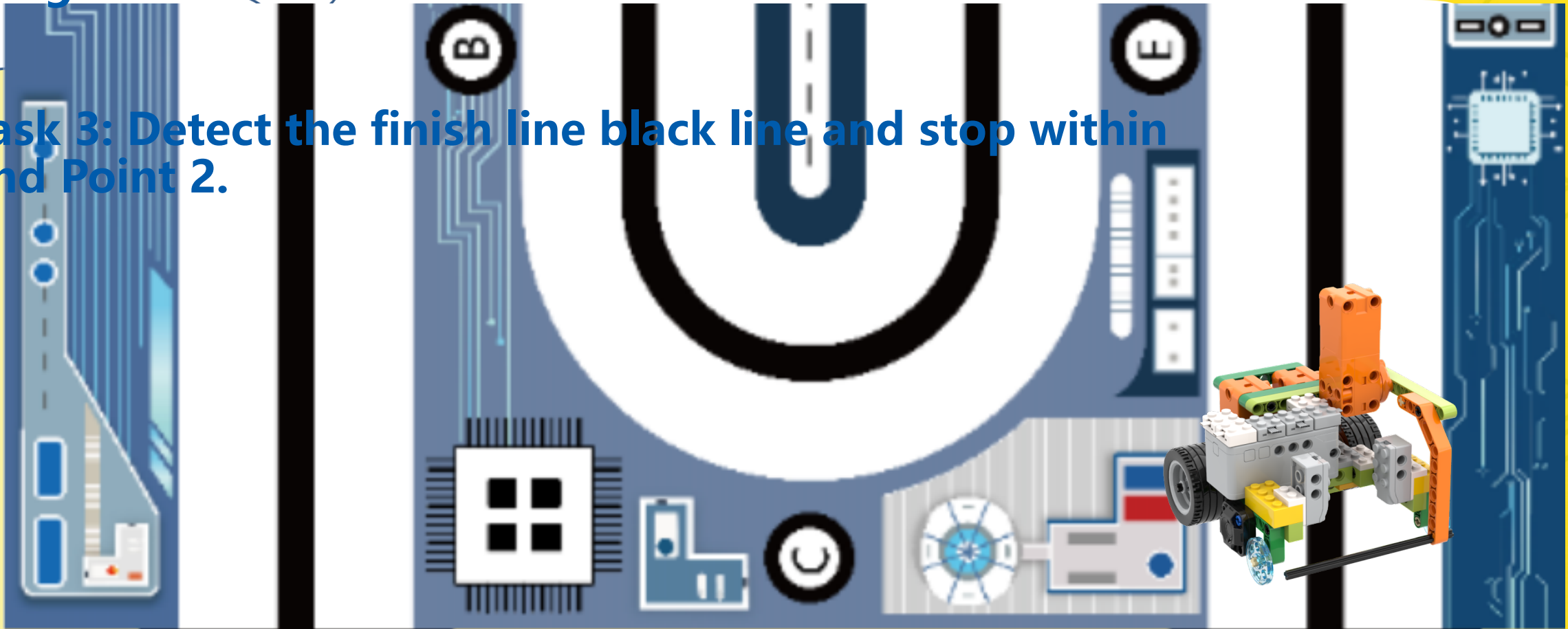
Referrable program 2

```
when clicked
  set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
  set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
  wait 1 seconds
  repeat until 1# color sensor's color code < 50
  line
  stop all ext motor(s)
  wait 0.3 seconds
  set 1# ext servo to keep running at 50 (-100~100)% power on anticlockwise
  set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
  wait 2.5 seconds
  stop all ext motor(s)
  wait 0.3 seconds
  forever
  line
```



Task Segmentation

Task 3: Detect the finish line black line and stop within End Point 2.



1

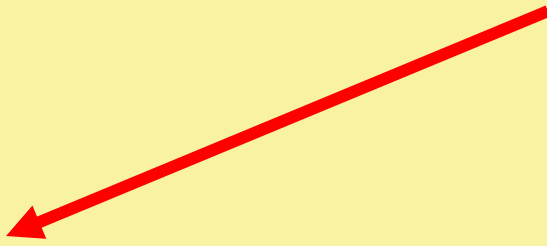
2



Task

Referrable program

```
define line
if 1# single channel line tracker's value < 23 then
if 2# single channel line tracker's value < 23 then
set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
else
set 1# ext servo to keep running at 0 (-100~100)% power on clockwise
set 2# ext servo to keep running at 30 (-100~100)% power on clockwise
else
if 2# single channel line tracker's value < 23 then
set 1# ext servo to keep running at 30 (-100~100)% power on anticlockwise
set 2# ext servo to keep running at 0 (-100~100)% power on clockwise
else
stop all ext motor(s)
wait 0.3 seconds
set 1# ext servo to keep running at 50 (-100~100)% power on anticlockwise
set 2# ext servo to keep running at 50 (-100~100)% power on clockwise
wait 1 seconds
stop all ext motor(s)
wait 0.3 seconds
stop all
```



```
else
stop all ext motor(s)
wait 0.3 seconds
set 1# ext servo to keep running at 50 (-100~100)% power on anticlockwise
set 2# ext servo to keep running at 50 (-100~100)% power on clockwise
wait 1 seconds
stop all ext motor(s)
wait 0.3 seconds
stop all
```

