08.The treadmill

1.Introduction

Treadmill is a piece of fitness equipment found in homes and gyms that allows people to complete long distances without leaving the building.



1.Introduction

The forerunner of the exercise treadmill was designed to diagnose heart and lung diseases, and was invented by Robert Bruce and Wayne Quinton at the University of Washington in 1952

In 1960s, William Staub, a mechanical engineer, took inspiration from Dr. Bruce and created the first home exercise treadmill (PaceMaster 600).



2.Exploration



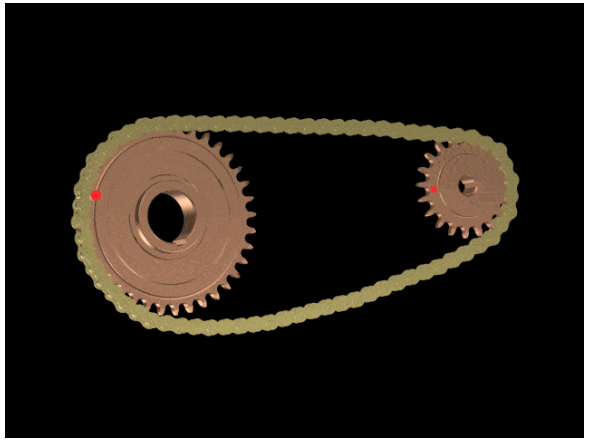
1. Does a treadmill have an end or stop point?
2. Why does the treadmill go on forever?
3. How do you control the running of a treadmill?

Follow the teacher to understand the mechanical mechanism to be applied (chain drive structure).

2.Exploration

Chain drive is a transmission mode that transmits the movement and power of the driving sprocket to the driven sprocket through the chain.

Features: accurate average transmission ratio, reliable operation, high efficiency; Large transmission power, strong overload capacity.



2.Exploration

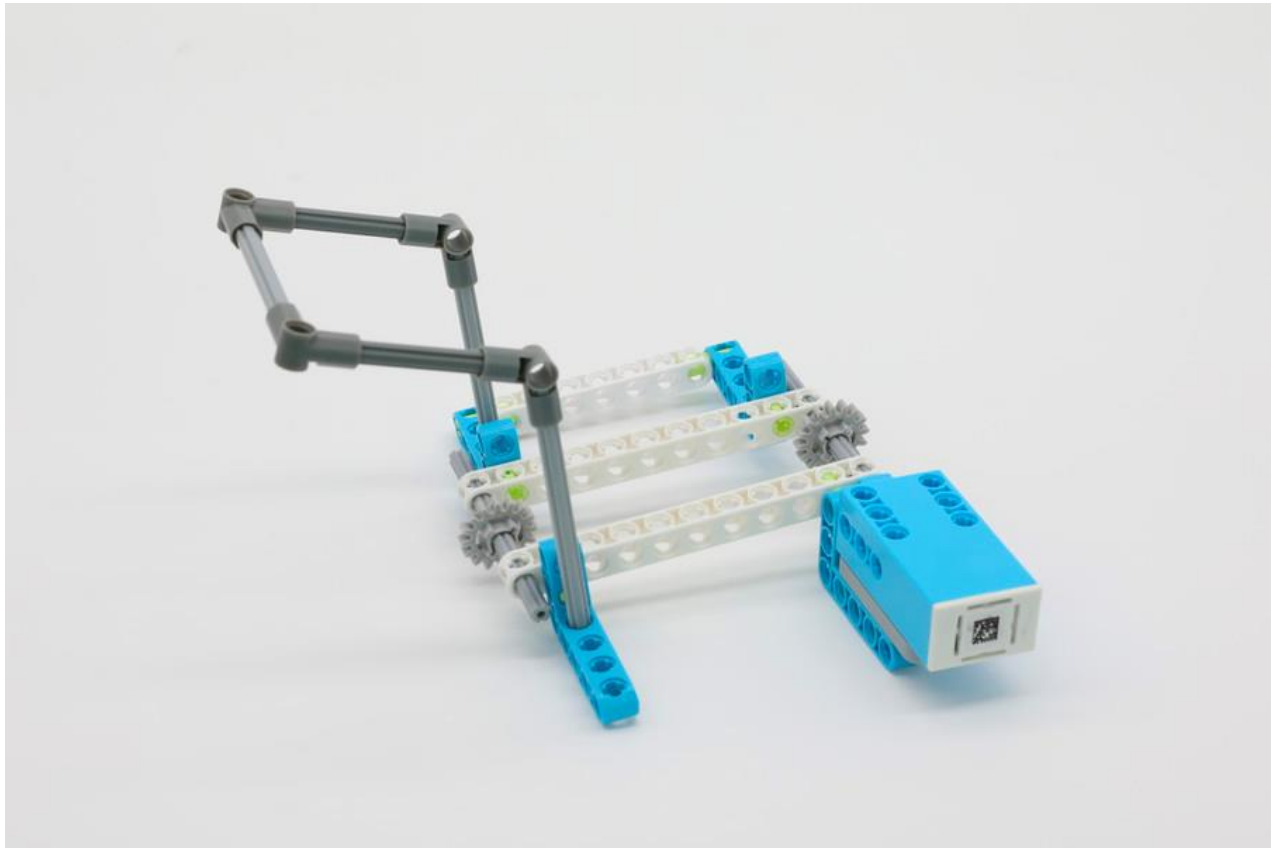
Through observation, master the composition of the treadmill structure, and then construct the treadmill.

Analyze the structure of the treadmill before setting it up. The treadmill has a running belt, handrails, display screen, etc.

The running belt of the treadmill is mounted on the gear, which is combined into a chain drive by the gear and track.



3.Construction



3.Construction



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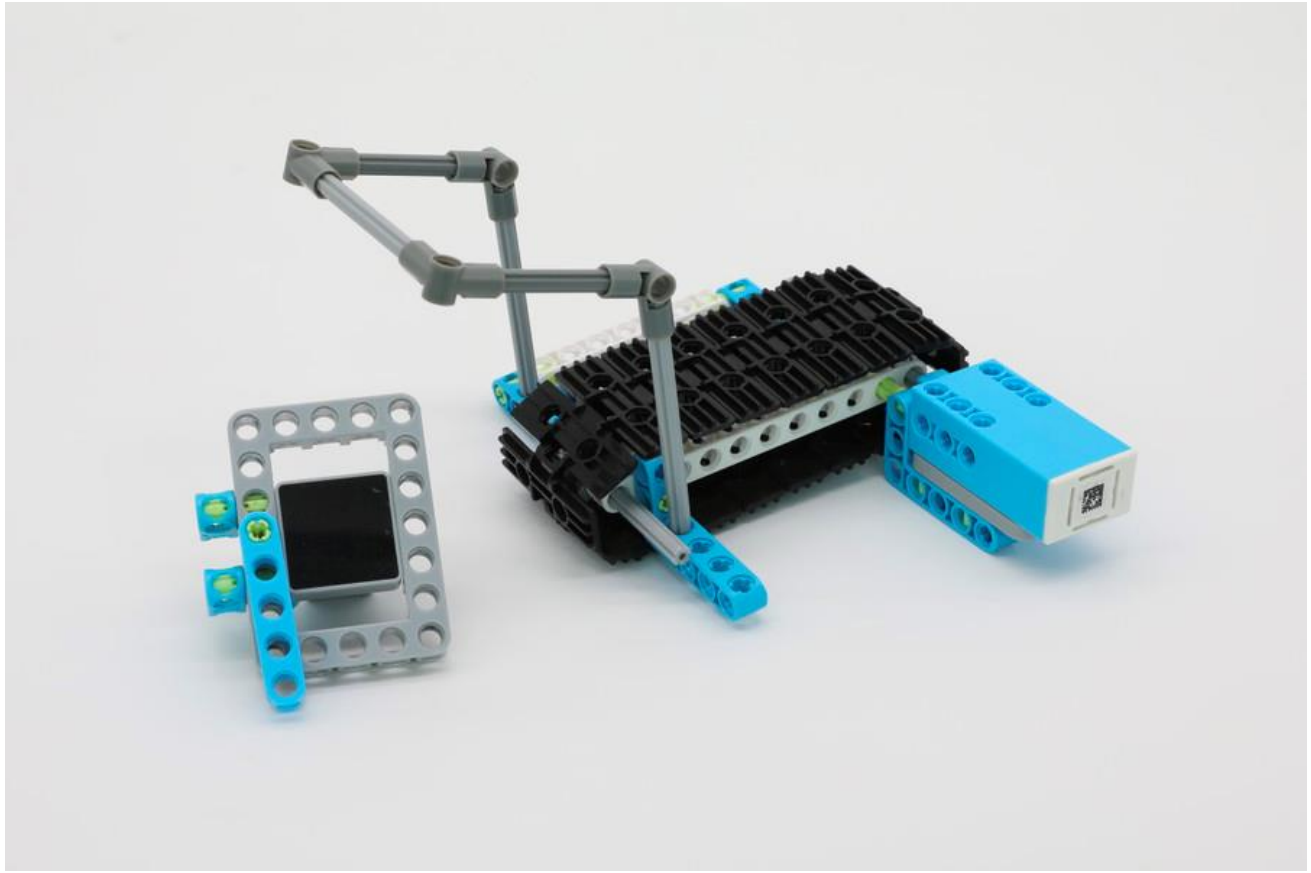

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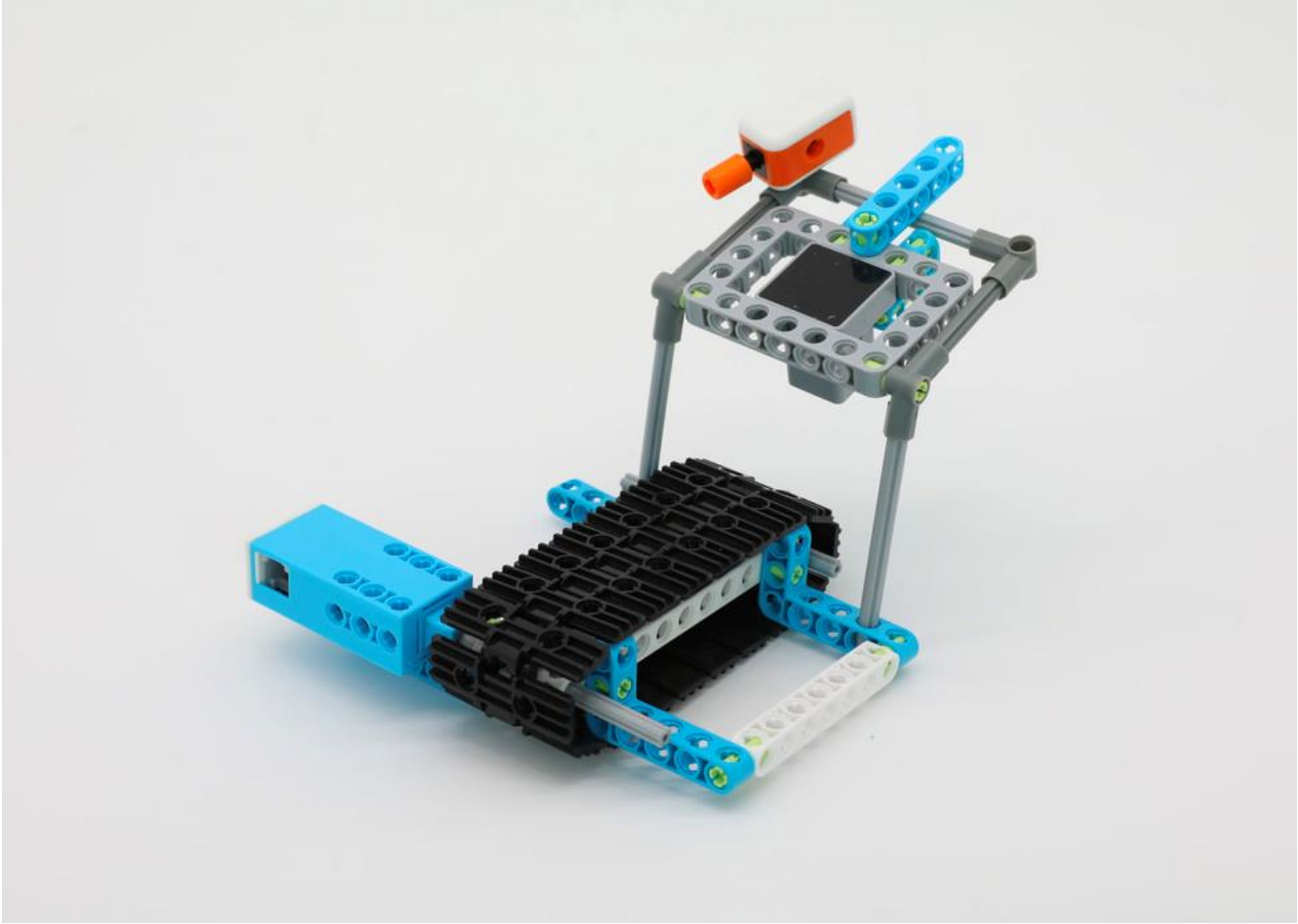
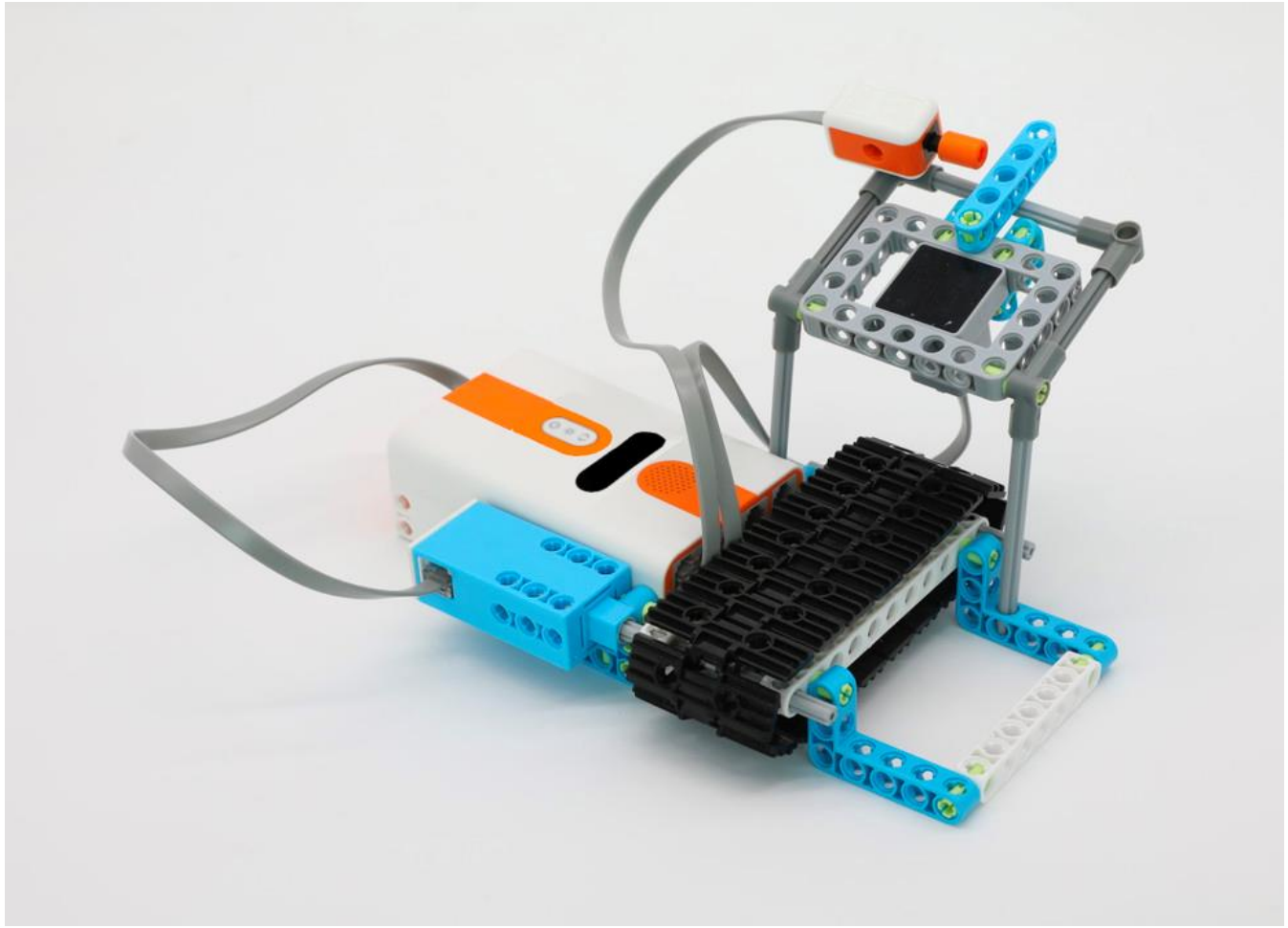


3.Construction



3.Construction

Connect the motor to port A.
Connect motion screen to port 1 and the touch sensor to port 2。

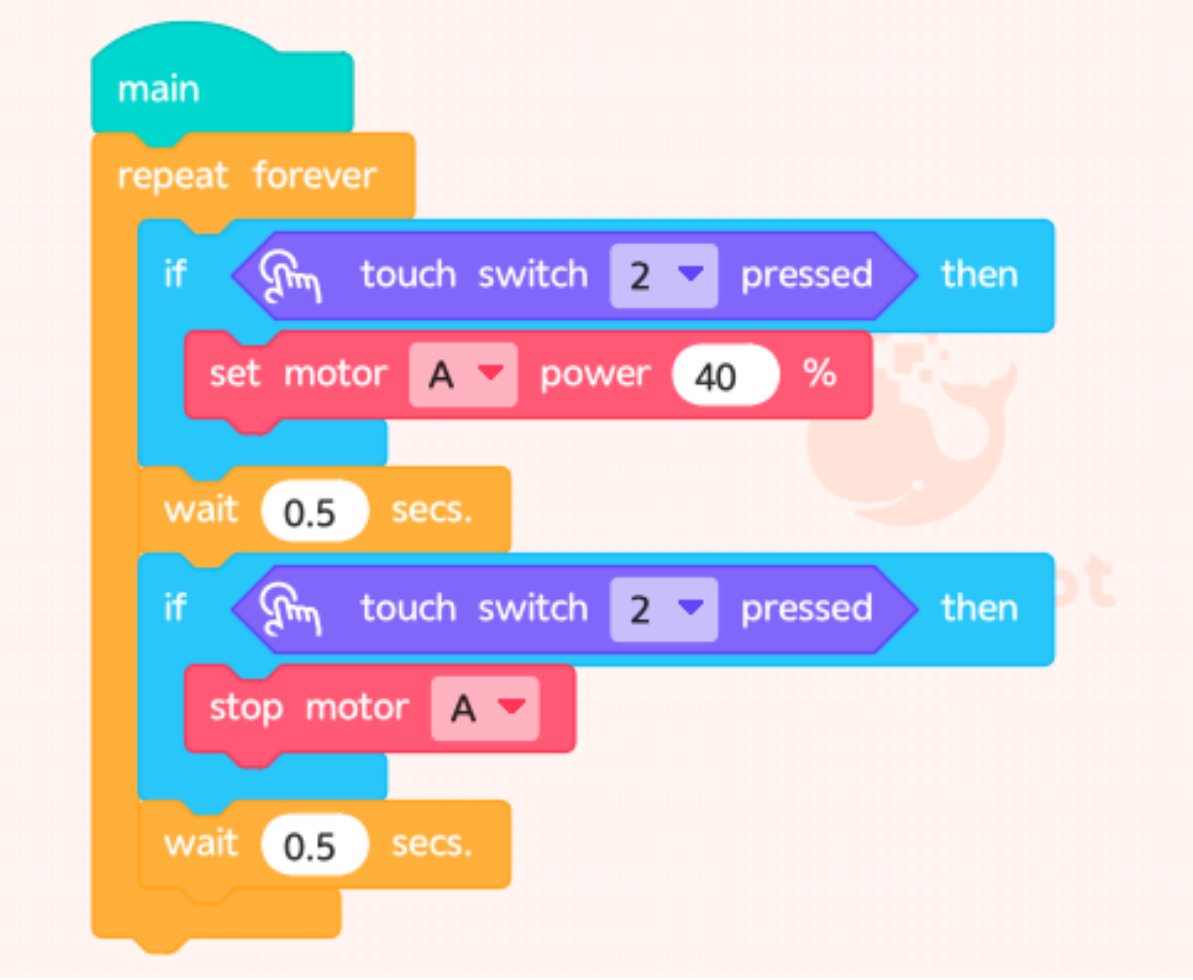


4.Coding

When the touch sensor is pressed, the treadmill starts to work.
When the touch sensor is pressed again, the treadmill stops working



4.Coding


main
repeat forever
if touch switch 2 pressed then
set motor A power 40 %
wait 0.5 secs.
if touch switch 2 pressed then
stop motor A
wait 0.5 secs.

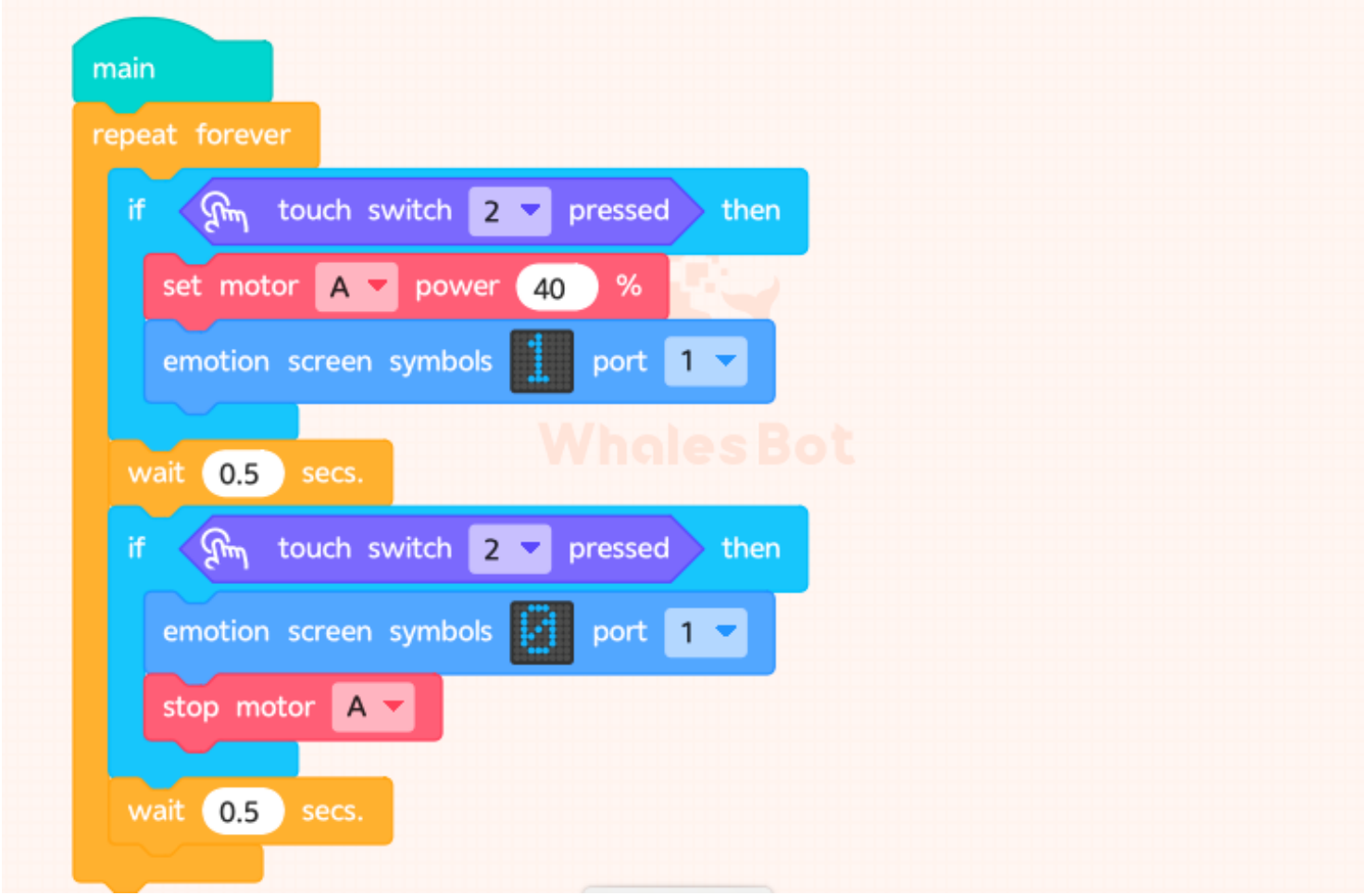
4.Coding

When the treadmill is working, the emotion screen shows the number 1.

When the treadmill stops working, the emotion screen displays the number 0.



4.Coding


main
repeat forever
if touch switch 2 pressed then
set motor A power 40 %
emotion screen symbols port 1
wait 0.5 secs.
if touch switch 2 pressed then
emotion screen symbols port 1
stop motor A
wait 0.5 secs.
WhalesBot

5.Evaluation

What are the characteristics of chain drive?

A. The two sprocket are rotating in opposite directions

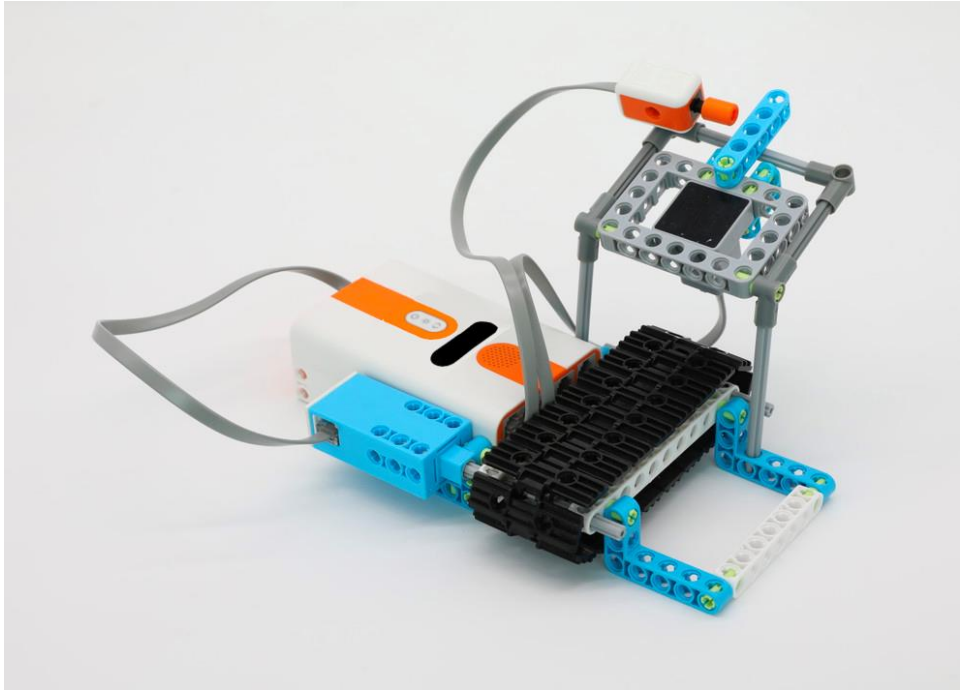
B. The two sprocket are rotating in the same direction

C. The speed of each part of the chain is different

D. simple installation



6.Challenge



Why do we need the wait module in the coding?
Based on the coding with emotion module, remove one of the wait module at a time and observe the outcome

Add a welcome to your treadmill by saying Hello when it starts.