



Q-scout Series Course

Section 12:
《Brave Q-scout》

Curriculum objectives

Knowledge and objectives (Technical)

1. Learn the usage of variable and arithmetic modules: “ add, subtract, multiply and divide” in the programming.
2. Complete curriculum task of brave Q-scout.

Knowledge and Skills (Cognitive)

1. Through the programming of arithmetic module, cultivate student’s calculation and logical thinking abilities.

Knowledge and skills (Emotional attitude and values)

1. The process that helps Q-scout to face trouble bravely, we enhance students' managerial skills so that they can deal with different troubles in their life.

Curriculum introduction

In an obstacle avoidance mission, the Q-scout do not have the time to avoid the obstacles in front of it due to a program error, and it was directly hitting the wall, which caused an inner shadow of the Q-scout. Onwards that time, it dared not to move forward whenever it detected the obstacles such as the wall from a distance.

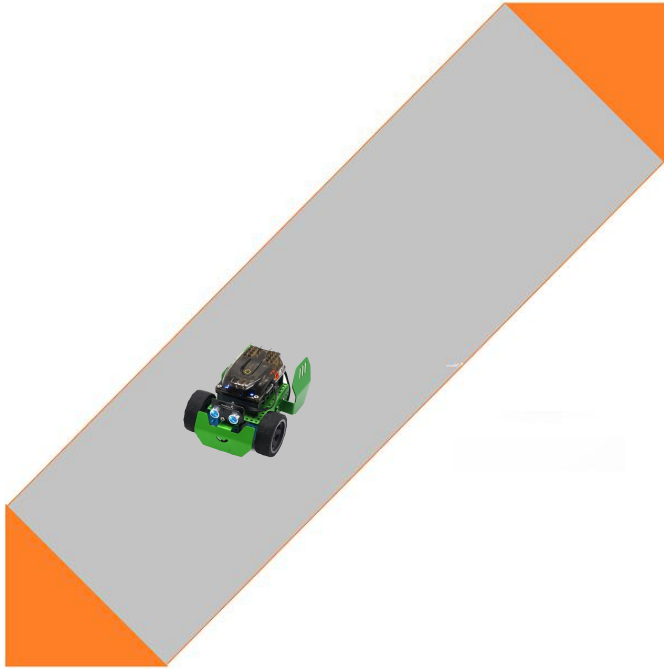


Curriculum introduction

We have always hoped that the Q-scout can break through itself and face bravely, so we have come up with a method to let the Q-scout break through slowly instead of giving up or opting for an escape route.



Curriculum introduction



We have designed two obstacles to be placed on both sides. Every time when an Q-scout detects an obstacle, it chooses to turn around and go to the obstacle on the other side. In order to make Q-scout brave and to get closer to the obstacle, it will reduce 5 cm after turning around every time it meet the obstacle.

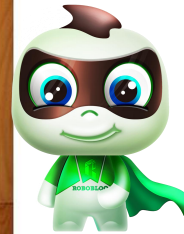
Task analysis

After every cycle, the distance detected by the ultrasonic sensor from the obstacle is reduced by 5 cm, but when the distance detected by the ultrasonic sensor is less than 10 cm, the advance is stopped.

1. How can the Q-scout calculate the distance to be reduced by 5cm after each cycle?

Knowledge explanation

Recognizing variables: because the detection distance of the ultrasonic sensor changes after each cycle, we need to store the changed number. A variable is a temporary storage space for continuous updating storage space with a name. The storage space is used by the name of the variable.

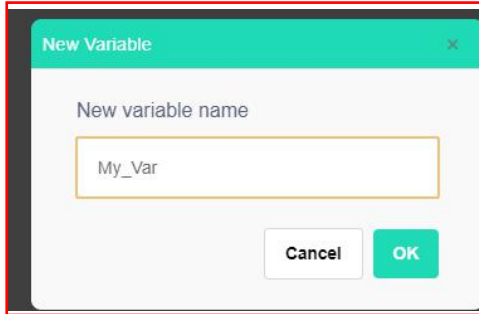
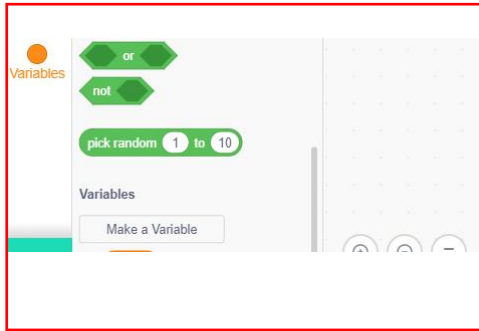


Roboblog



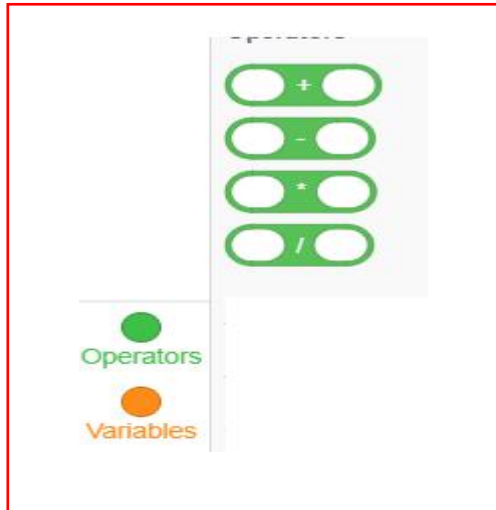
Knowledge explanation

Build new variable: in the programming software, select the "variable" module, click to create a new variable, enter the name of the variable, and set the variable as the number of the ultrasonic sensor.



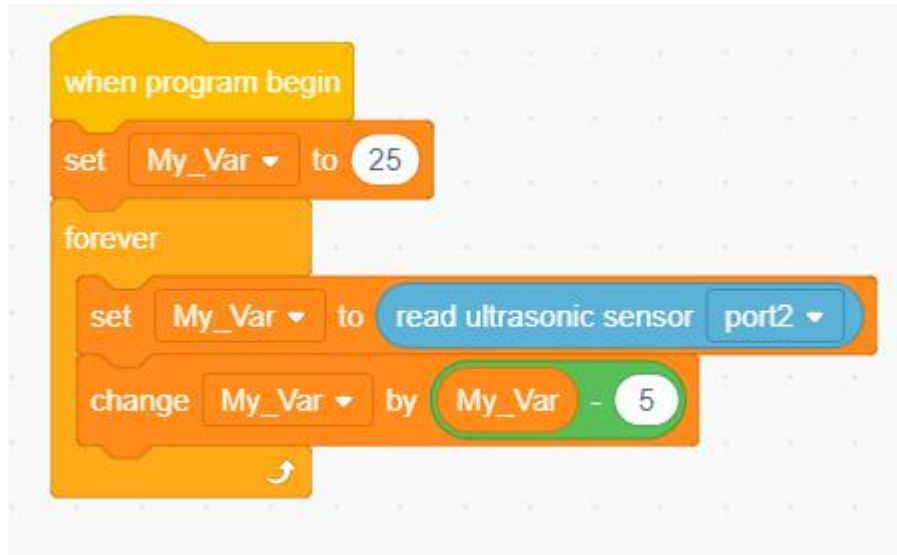
Knowledge explanation

Usage of addition, subtraction, multiplication and division:
select subtraction icon in "arithmetic module" and set variable c
to " c-5".



Hands-on practice

In the task, we can set the initial detection distance of the Q-scout to 25cm, and reduce it by 5cm according to the usage and operation of variables after each cycle.



Hands-on practice

```
when program begin
  set My_Var to 25
  forever
    set My_Var to read ultrasonic sensor port2
    change My_Var by My_Var - 5
    run forward at speed 45
    if My_Var < 10 then
      run turn right at speed 0
      if My_Var < 25 then
        run turn right at speed 45
        wait 0.6 secs
```

When the Q-scout detects that it is larger than 10cm, execute the turn-around procedure, and when the detection distance of the Q-scout is smaller than 10cm, execute the stop procedure, so that the Q-scout can bravely again.

Extends

Set the initial distance of the Q-scout's ultrasonic sensor to other number and upload the program so that the Q-scout can check lot of times when the program runs.

Look up data, learn more about variables, and summarize the function of variables in computer language.

Conclusion and reflection

1. What other ways can you help Q-scout to recall himself and move again bravely?



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