C - Secure the Planet!

One of your tasks on the mission is to secure the planet for mankind - learn how to speed up your programs to get our robot to patrol the planet surface.

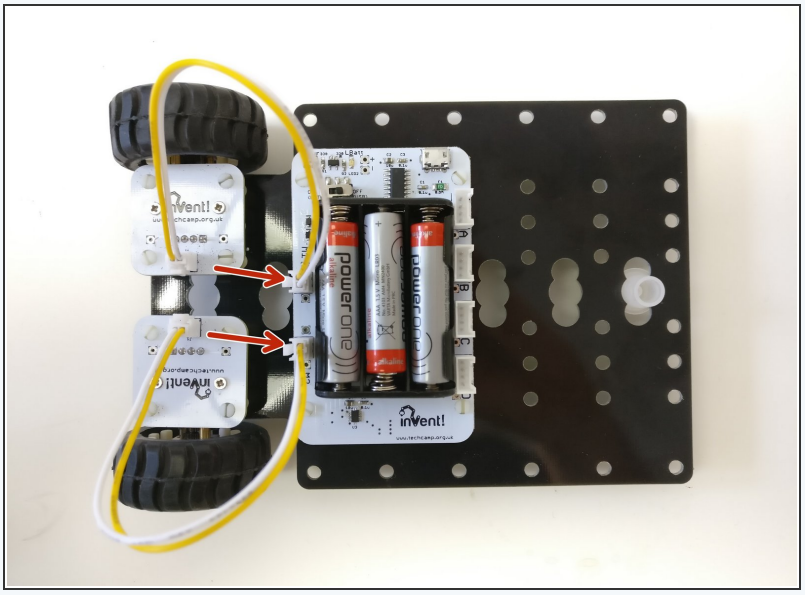
INTRODUCTION

One of your tasks on the mission is to secure the planet for mankind - learn how to speed up your programs to get our robot to patrol the planet surface.

Step 1

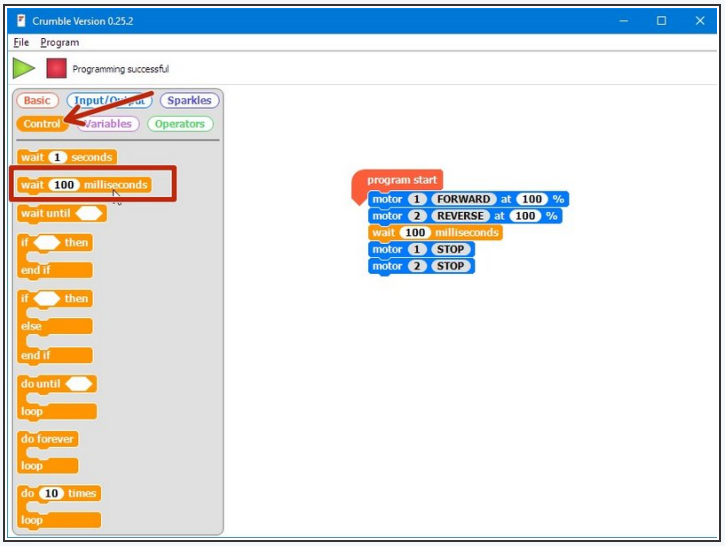
Robot Setup

- Make sure your robot is setup in the same way as the previous sections!



Step 2

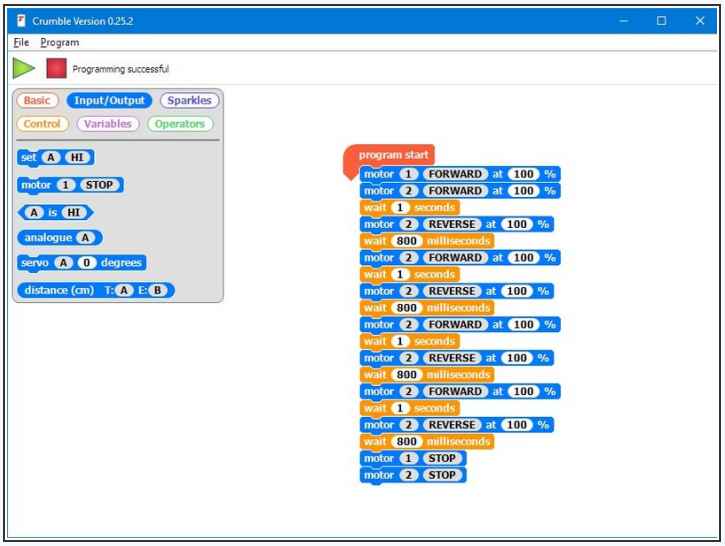
Turning Accurately



- For the rest of this lesson, we need to be able to make the robot turn **accurately.**
- Build the program in the picture, and make sure to use the **wait 100 milliseconds** block instead of the wait 1 second block.
- You can find it in the **control** menu - this block allows us to adjust the wait time by amounts **smaller than 1 second!**
- There are **1000 milliseconds in 1 second** - adjust the number until your robot turns by exactly **90 degrees.** Don't forget to get the challenge checked off when you've done it!

Step 3

Driving in a Square

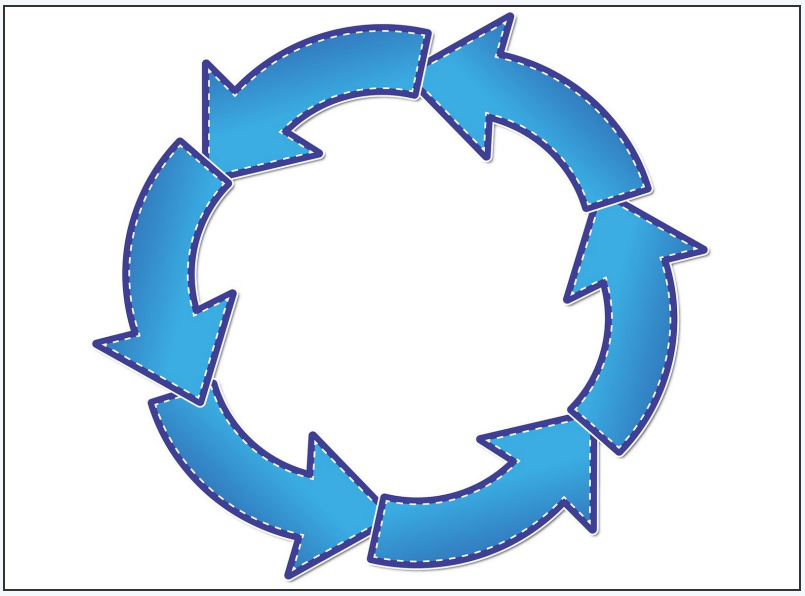


- Now you can turn by 90 degrees, write a program that makes your robot **move in a square!**
- It should like something like the example in the picture but your **'wait'** commands will be different.
- If you think about it, you only need to **reverse** 1 motor and then set it to **forwards** again to change direction - one motor can be going forward **all the time.**

Also, you don't necessarily need to **stop** after turning - just **set the motor going in reverse** to go forward again!

Step 4

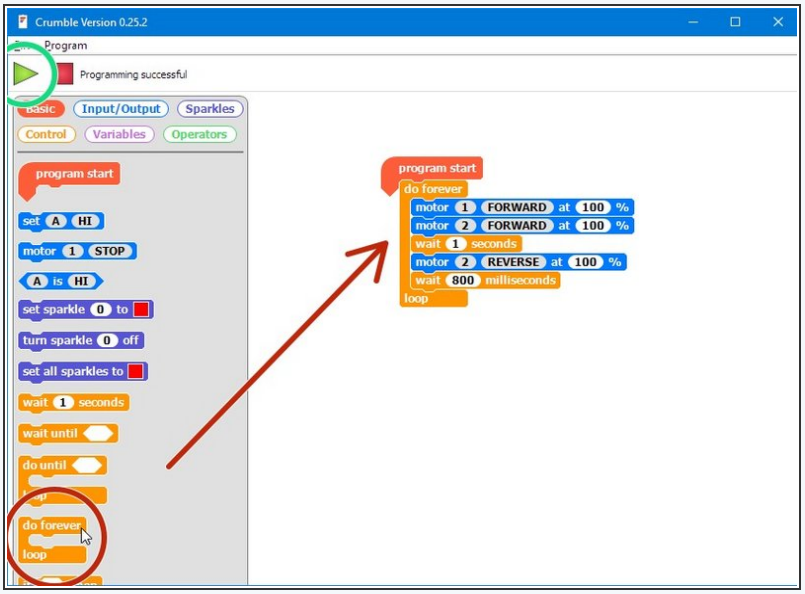
Using a Loop



- Making that last program took a while - and the robot was just doing the same things **over and over again.**
- Say we wanted to drive in a square 10 times - that would take **ages to program!**
- Driving in a square was doing the **same thing 4 times:**
  - Drive forward
  - Wait
  - Turn
  - Wait
- We can use a **loop** to get the computer to repeat these steps for us!

Step 5

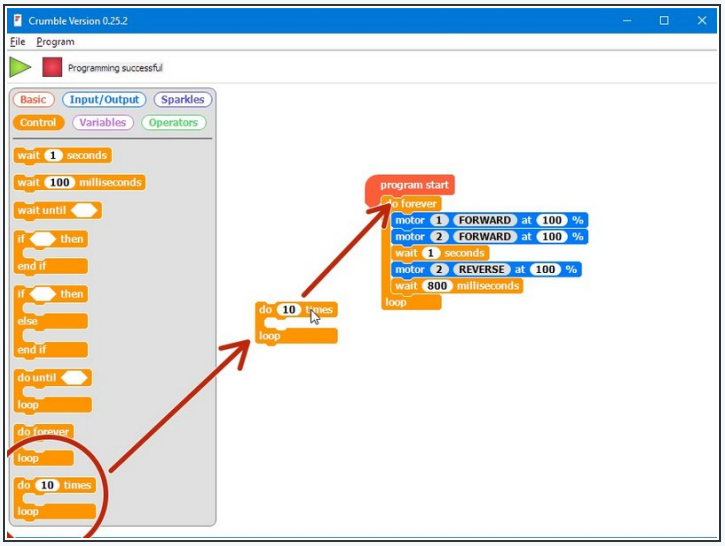
Do Forever Loop



- One of the most useful loops is the **Do Forever** loop
- Anything inside this loop is just repeated forever!
- Let's use this to make our robot move in a square forever.
- Drag in a **do forever** loop from the **basic** menu, and put some blocks inside it that make your robot **drive forward** and then **turn 90 degrees**
- **Upload** the code to your robot - it should move in a square forever!

Step 6

Loop, but not forever

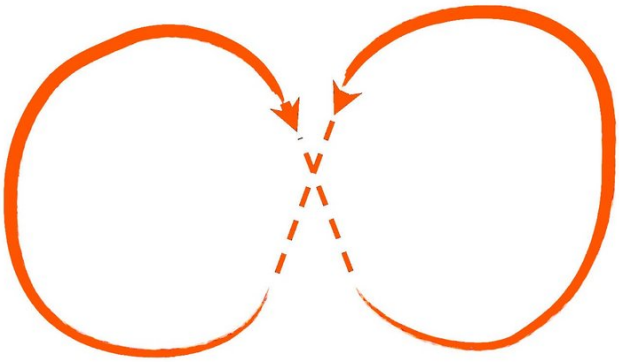


- What if we don't want to move in a square forever?
- Luckily, there are other types of loops we can use that can do things more cleverly.
- Replace your do forever loop with a **do _ times** loop, and change it so it only repeats **4 times** (look in the **Control** menu)
- Now your robot should move in a square once, then **stop!**

Step 7

Figure of 8

Extension Challenge!



- Now your robot can drive in a square using a loop, let's **change the code** so it will drive in a **figure of 8.**
- Have a look at the picture if you don't know what a **figure of 8** is.
- Try to split the shape up into **2 sections,** and use a **do _ times** loop to reduce the length of your sequence.