

## 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.



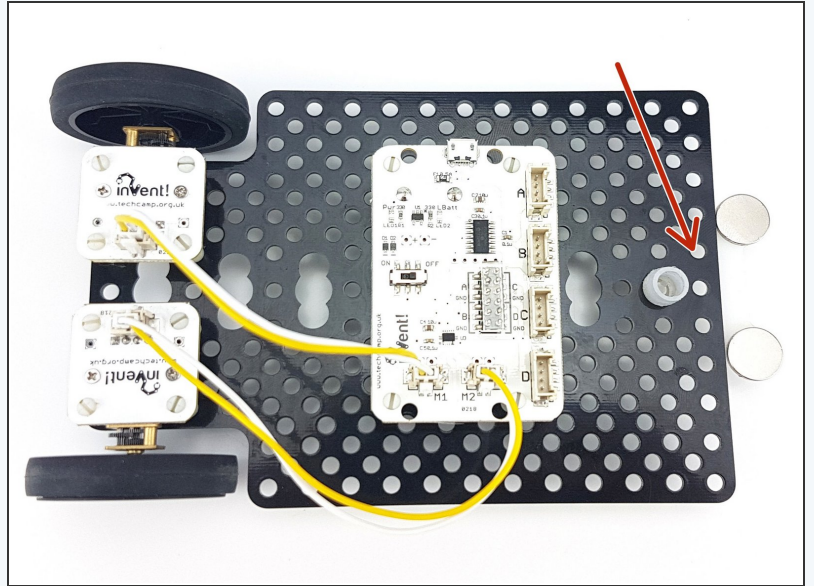
# INTRODUCTION

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

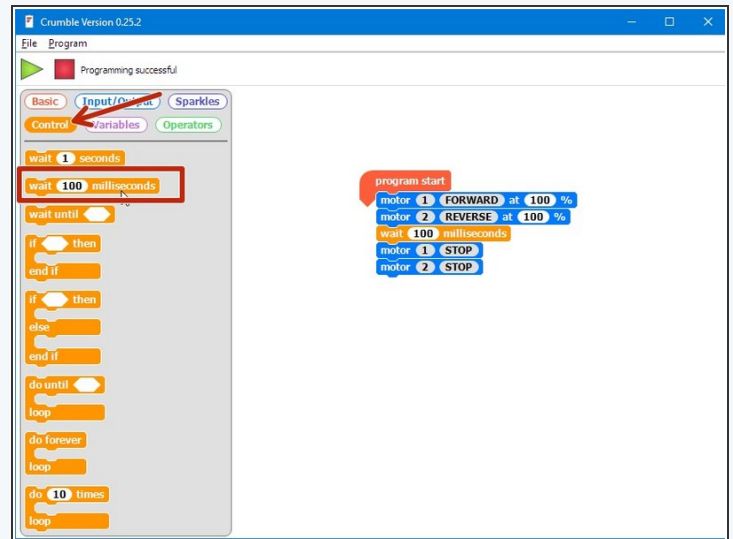
- Make sure your robot is setup in the same way as the previous section, with the **magnets still attached!**



## Step 2

### Turning Accurately

# Challenge!



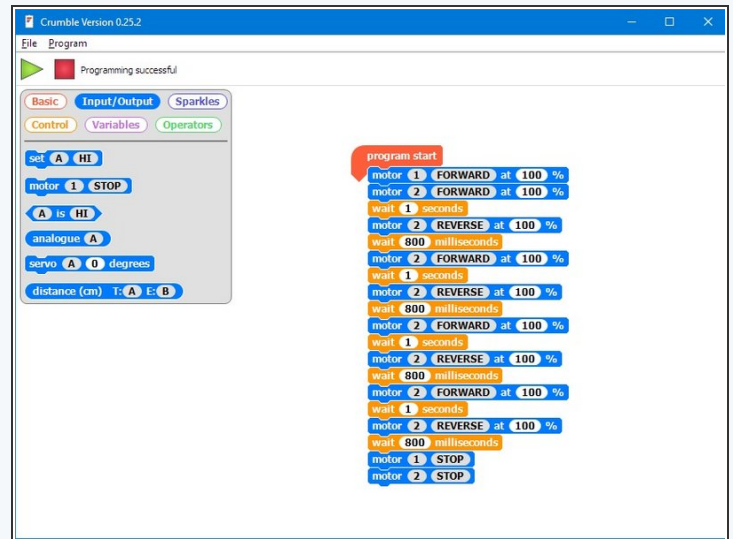
- For the rest of this lesson, we need to be able to make the robot turn **accurately**.
- Build the program in the picture, and make sure to use the **wait 100 milliseconds** block instead of the wait 1 second block.
- You can find it in the **control** menu - this block allows us to adjust the wait 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

# Challenge!

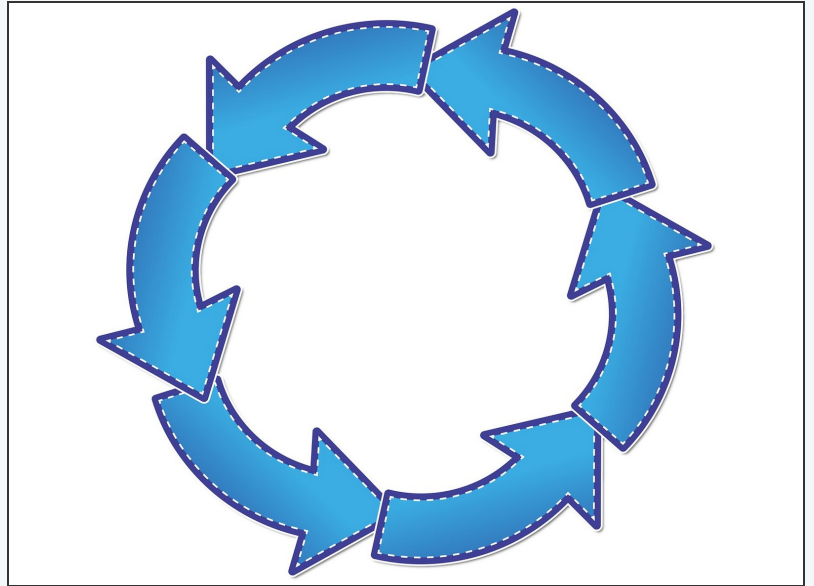


- Now you can turn by 90 degrees, write a program that makes your robot **move in a square!**
  - It should like something like the example in the picture but your **'wait'** commands will be different.
  - If you think about it, you only need to **reverse** 1 motor and then set it to **forwards** again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

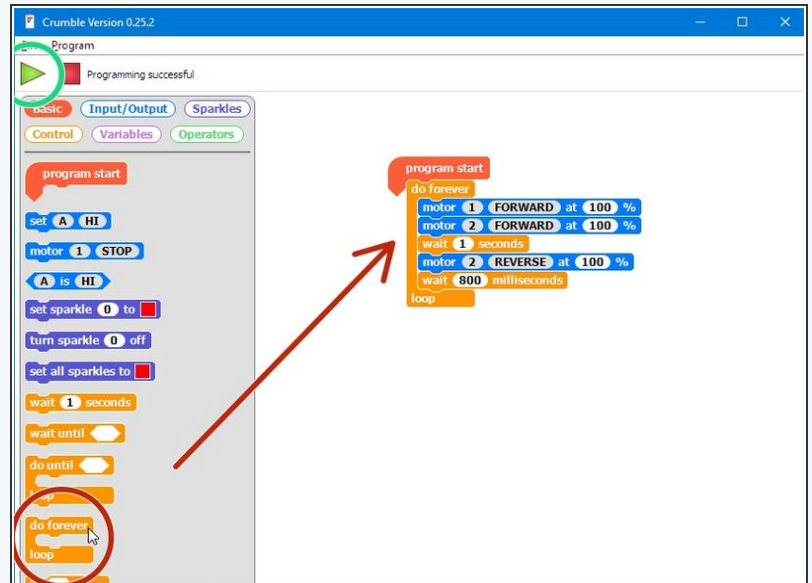
- Making that last program took a while - and the robot was just doing the same things **over and over again**.
- Say we wanted to drive in a square 10 times - that would take **ages to program!**
- Driving in a square was doing the **same thing 4 times:**
  - Drive forward
  - Wait
  - Turn
  - Wait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



## Step 5

### Do Forever Loop

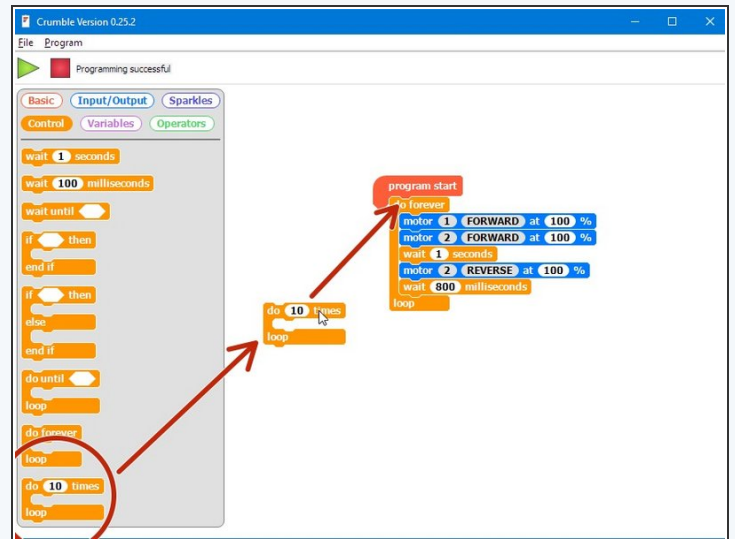
- One of the most useful loops is the **Do Forever** loop
- Anything inside this loop is just repeated forever!
- Let's use this to make our robot move in a square forever.
- Drag in a **do forever** loop from the **basic** menu, and put some blocks inside it that make your robot **drive forward** and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



## Step 6

### Loop, but not forever

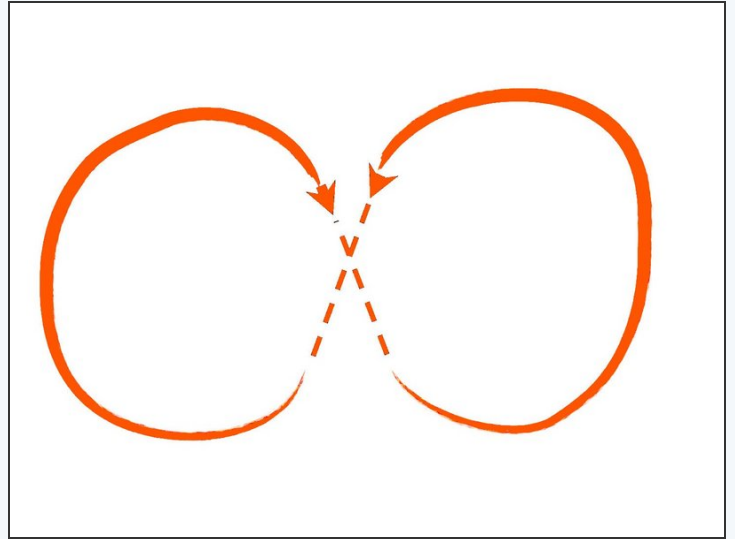
# Challenge!



- 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!**

## 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.