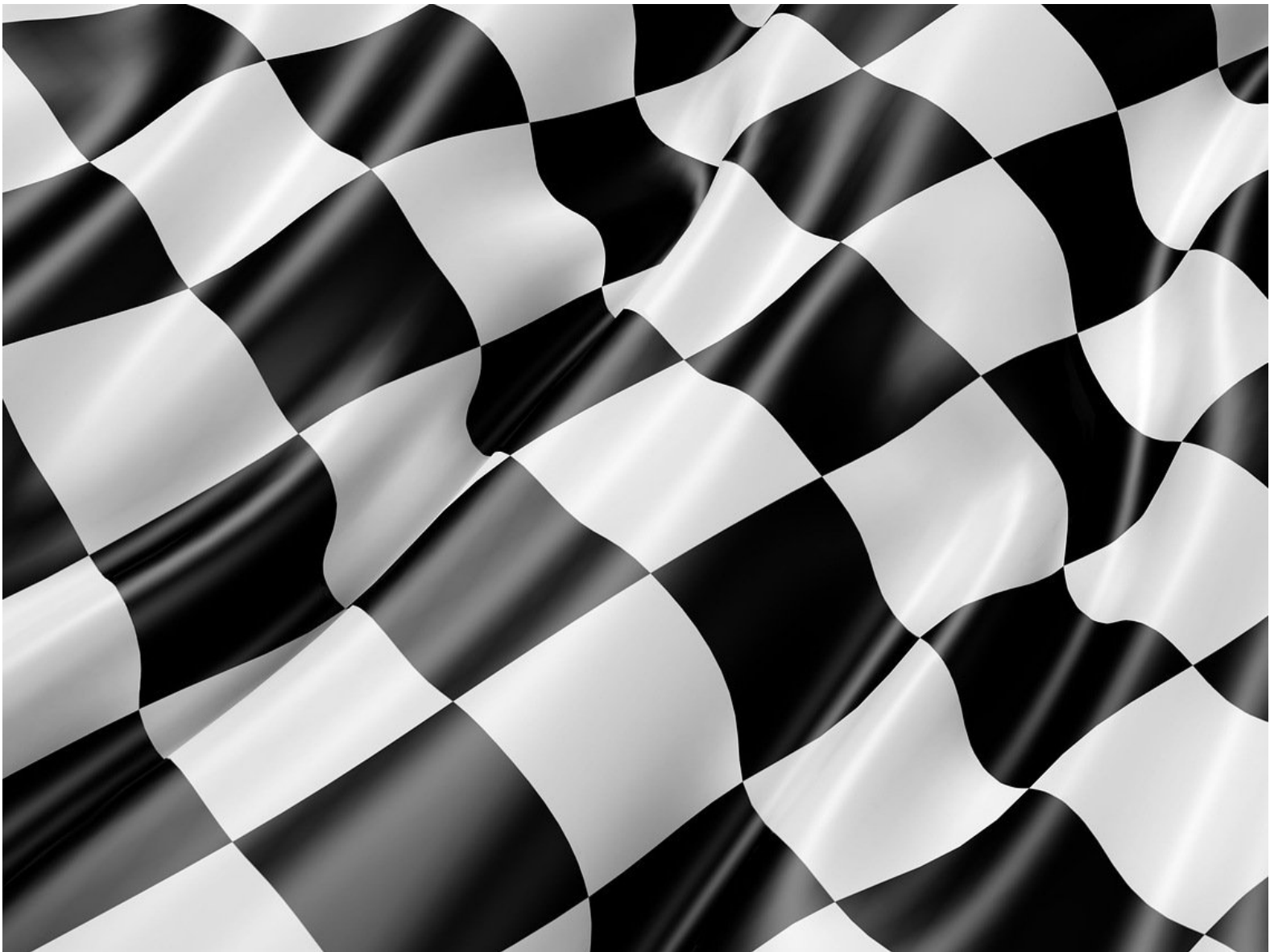


## D - Speed Competition!

Using all the things you've learned so far, build them all into one big line follower program that is as clever and reliable as possible!



# INTRODUCTION

Using all the things you've learned so far, build them all into one big line follower program that is as clever and reliable as possible!

## Step 1

### Speed Line Following

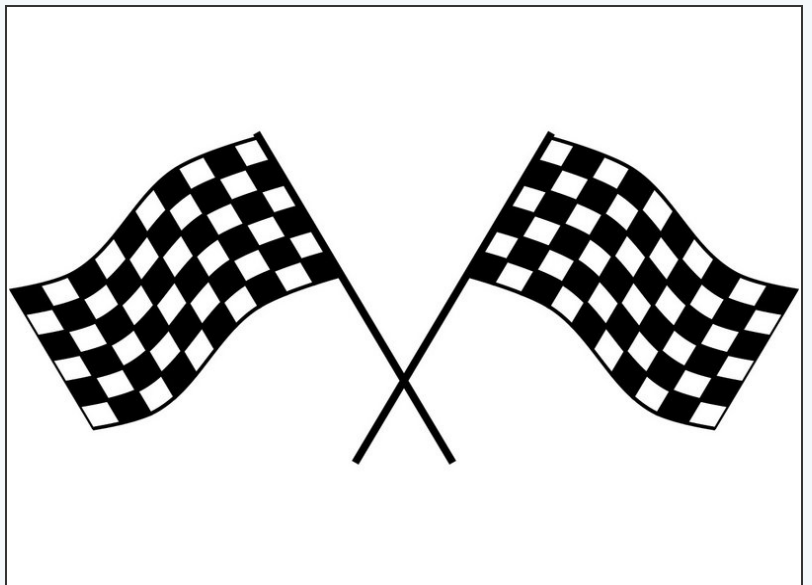
- Whilst line following robots are very important in factories, **speed line following competitions** are very popular in Universities and schools all over the world.
- Have a look at the video from a competition in Japan - this robot even does **2 runs**. On the first run it **learns the track** so it can go really fast on the second run!



## Step 2

### Race time!

- **Your teacher will tell you exactly what course you will be racing on**, but it could contain **anything** you have learnt so far:
  - Curvy tracks
  - Breaks in the track
  - Sharp Turns
  - Obstacles
- You need to make the **best program you possibly can** by combining together all of the separate things you have learnt to complete the course in the **fastest time**.
- You will have a chance to **test your robot** on the course before the race at the end.



### Step 3

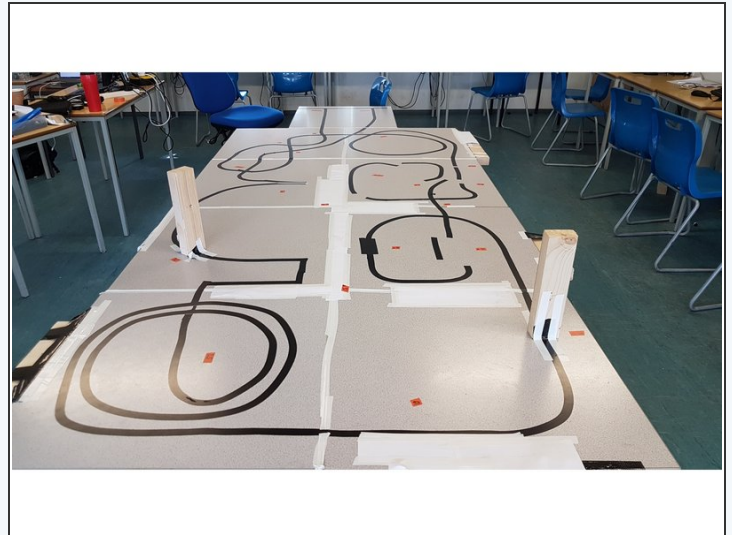
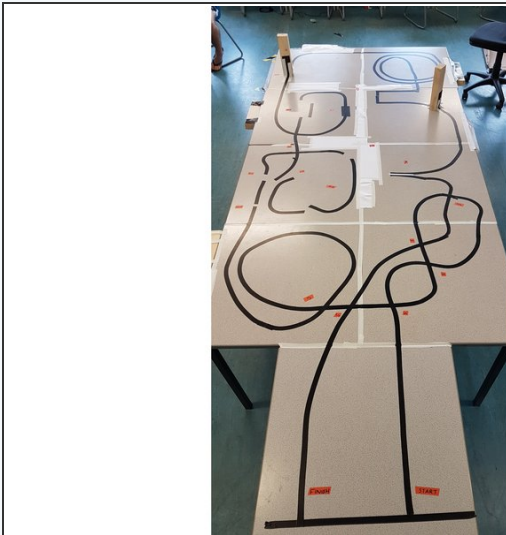
## Some Tips

- A **proportional** system will usually be faster than a simple digital one
- Test your robot as much as you can to find out where it might go **wrong!**
- **Use Sparkles as feedback** to help you work out exactly what your robot is doing
- Try and have something in your program that **attempts to find the line again** if the robot gets lost - you **never know what will happen** on the final run!
- Try to keep your program simple (**don't use more blocks than you need to**) to keep it running quickly.
- Good luck!



### Step 4

## Course Examples

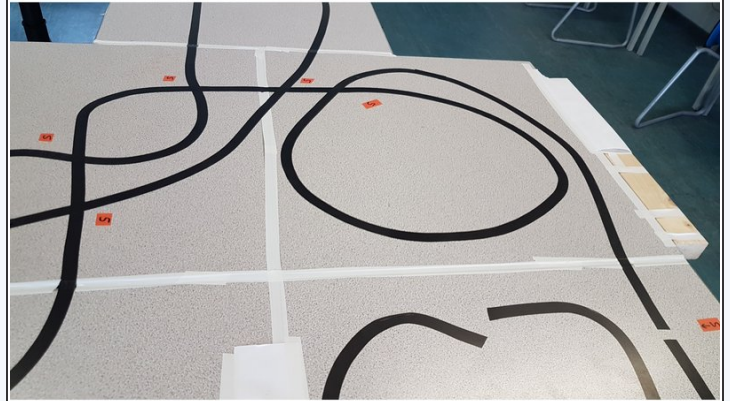
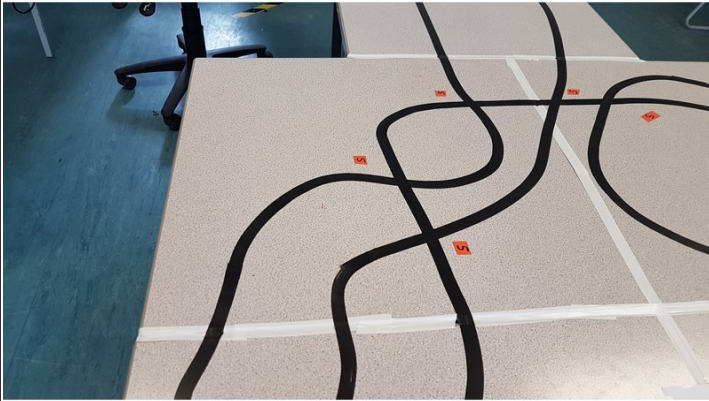


- Here are some examples of obstacles you could use in a course!
- You can assign points to each obstacle, so each one successfully navigated gets a certain number of points, depending on the difficulty.



## Step 5

### Crossovers



- Here are some crossovers and tightly packed tracks.

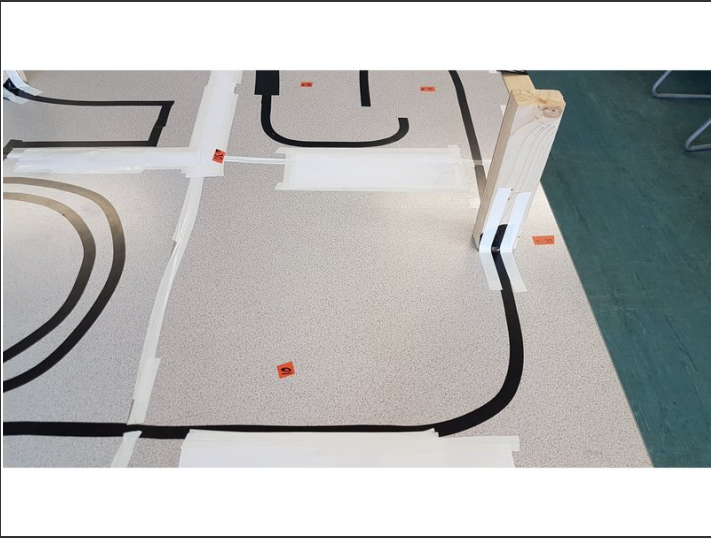
## Step 6

### Breaks

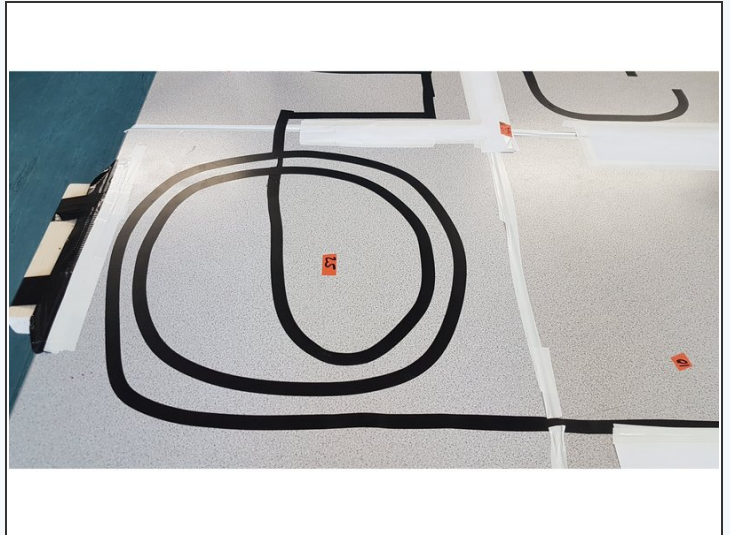
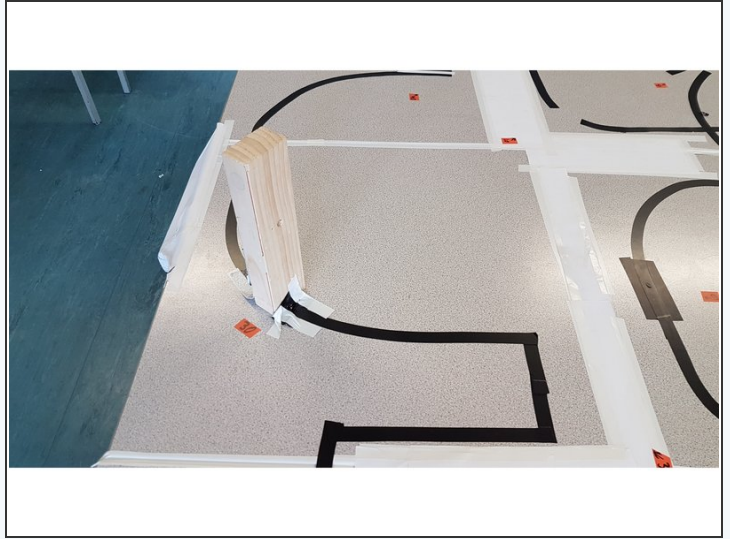


- Straight breaks, curved breaks and offset breaks

## Obstacles and Spirals



- Obstacles (on curved and straight track), thin sections and a spiral



## Step 8

### Switchback

- This one is very difficult - the dead end switchback!

