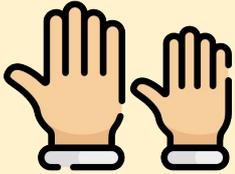


Lesson 6 - Python III - Turtle Race (Simplified)



Learning Outcomes:

- Make a random race which races turtles for fun
- Learning about for loops
- Customising your game



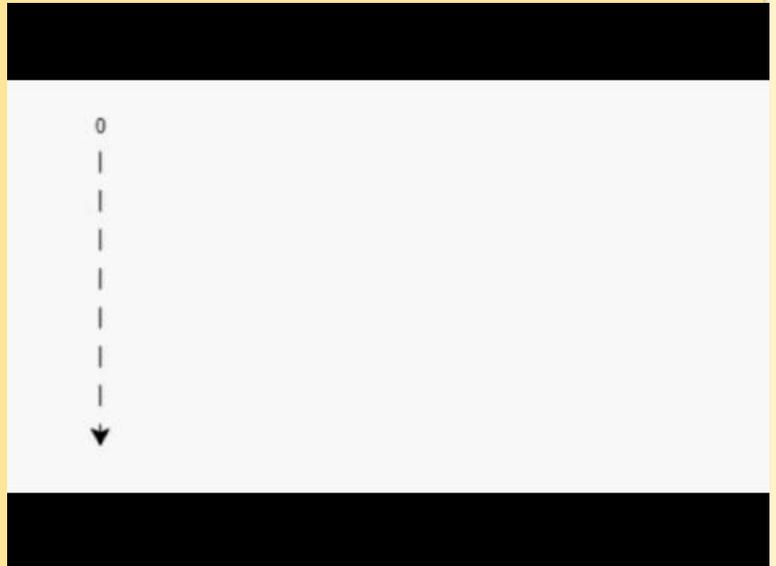
REMEMBER: Put up your hand. We love to help!



Let's Get Coding

CTRL+CLICK this video to see the end result. The game will be similar to a horse racing game you may have seen before.

The code on the left below is very repetitive. There is an easier way to code this in python called a **for** loop. Change your code so it looks like the code on the right. We need to give it a **range of 6** because there are **6** numbers between 0 and 5.



```
1  #!/bin/python3
2  from turtle import *
3
4  write(0)
5  forward(20)
6  write(1)
7  forward(20)
8  write(2)
9  forward(20)
10 write(3)
11
```



```
#!/bin/python3
from turtle import *

for step in range(6):
    write(step)
    forward(20)
```





For Loops - Making it easy

1 CTRL+CLICK this link:

<https://trinket.io/embed/python/49ff05172b>

```
#!/bin/python3
from turtle import *
from random import randint

penup()
goto(-140,140)

for step in range(15):
    write(step)
    forward(20)
```

This code will make a list from 1-14.

We then need to draw the lines

2

To draw the lines, we're going to have to turn the turtle to the right, before putting a pen down, drawing a line of 150, picking the penup and moving backward to the start of the line. Add the code in blue below and see what happens.

```
for step in range(15):
    write(step, align='center')
    right(90)
    forward(10)
    pendown()
    forward(150)
    penup()
    backward(160)
    left(90)
    forward(20)
```

right(90) makes the turtle turn right 90 degrees (a right angle.) Moving **forward(10)** before putting the pen down leaves a small gap between the number and the start of the line. After drawing the line you lift up the pen and go **backward(160)** the length of the line plus the gap.



Racing Turtles

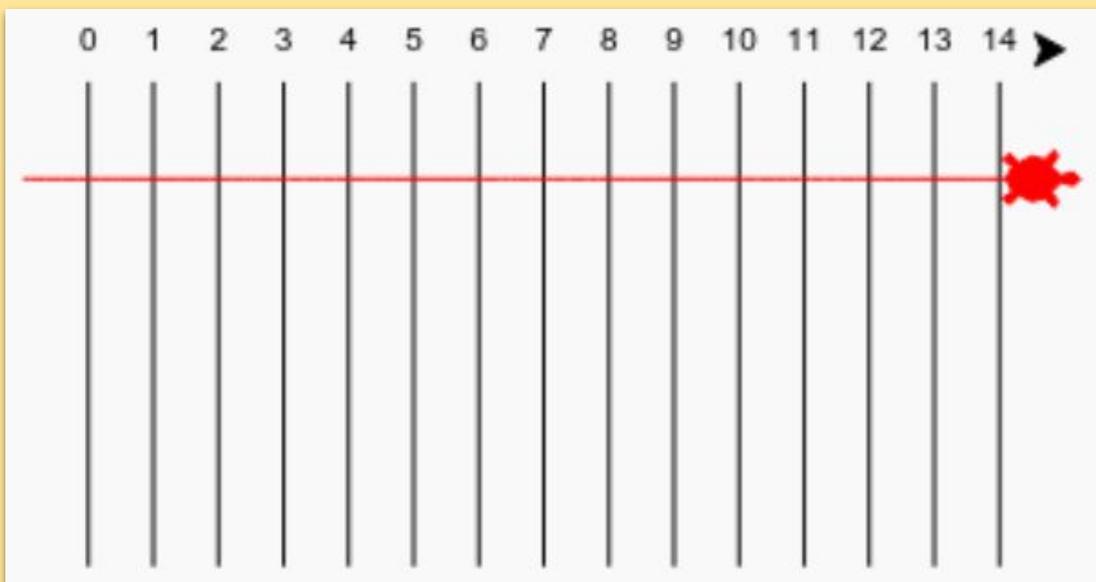
3 When you use commands like `forward(20)` you are using a single turtle. But you can create more turtles. Add the following code to the end of your script (but make sure it's not indented)!

```
redTurtle = Turtle()  
redTurtle.color('red')  
redTurtle.shape('turtle')  
redTurtle.penup()  
redTurtle.goto(-160,100)  
redTurtle.pendown()
```

The first line creates a turtle called 'red'. The next lines set the colour and shape of the turtle. Now it really looks like a turtle!

4 Test the code and you should get a one-turtle race! We'll add more next. The code below will get it to move in a random movement

```
redTurtle.penup()  
redTurtle.goto(-160,100)  
redTurtle.pendown()  
  
for turn in range(100):  
    redTurtle.forward(randint(1,5))
```





Adding more Turtles

```
redTurtle = Turtle()  
redTurtle.color('red')  
redTurtle.shape('turtle')  
redTurtle.penup()  
redTurtle.goto(-160,100)  
redTurtle.pendown()
```

Copy

```
blueTurtle = Turtle()  
blueTurtle.color('blue')  
blueTurtle.shape('turtle')  
blueTurtle.penup()  
blueTurtle.goto(-160,70)  
blueTurtle.pendown()
```

5

Paste

```
greenTurtle = Turtle()  
greenTurtle.color('green')  
greenTurtle.shape('turtle')  
greenTurtle.penup()  
greenTurtle.goto(-160,40)  
greenTurtle.pendown()
```

Paste

```
yellowTurtle = Turtle()  
yellowTurtle.color('yellow')  
yellowTurtle.shape('turtle')  
yellowTurtle.penup()  
yellowTurtle.goto(-160,10)  
yellowTurtle.pendown()
```

Paste

```
for turn in range(100):
```

```
    redTurtle.forward(randint(1,5))
```

```
    blueTurtle.forward(randint(1,5))
```

```
    greenTurtle.forward(randint(1,5))
```

```
    yellowTurtle.forward(randint(1,5))
```

5

A one turtle race isn't much of a game! Add the code on the left to get the remaining turtles going.

You should be able to see a pattern here so don't forget...

REMEMBER TO:

COPY (CTRL + C)

AND

PASTE (CTRL + V)

**Copy and Paste are a coders
best friends!**



Challenge: Do a twirl

Can you use a `for` `turn` `in` `range()`: loop to make each turtle do a 360 degree twirl after they get to the starting line? You'll need to make sure they are facing in the right direction at the start of the race!

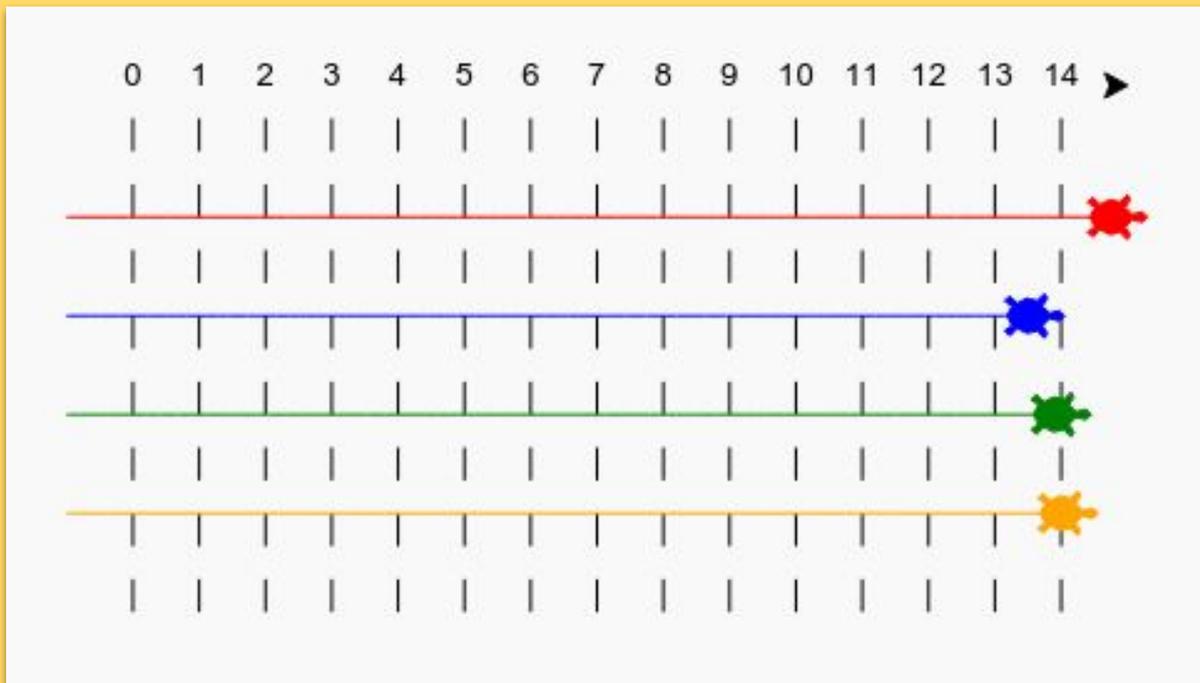
`redTurtle.right(36)` will turn the red turtle right by 36 degrees.

Hint: A full turn is 360 degrees. A turtle could turn right 10 degrees 36 times, or left 5 degrees 72 times, or any other numbers make 360!



Challenge: Dashed lines

Can you use a loop to make the track lines dashed instead of solid?



Hint: Find the code that draws a straight line.

Try using: `for`, `forward()`, `penup()` and `pendown()`

