

Different Types of Loops

Day 5 – PH 365

9 Oct 2024

You know `for` loops, now meet `while` loops

for loops:

- Tell the computer to execute code an exact number of times
- *“Go run 20 laps on the track”*

```
for i in range(20):  
    run a lap
```

while loops:

- Tell the computer to execute code as many times as it takes to meet a condition
- *“Go run laps until your legs feel like jelly”*

```
while legs != jelly:  
    run a lap
```

“Hidden” lines of code

```
nums = []  
for n in range(25):  
    nums.append(1 / n ** 2)
```

```
n = {next item in range(25)}
```

```
nums = []  
n = 0  
while n < 25:  
    nums.append(1 / n ** 2)  
    n += 1
```

Nothing hidden!

When does the computer exit the loop?

```
nums = []  
for n in range(25):  
    nums.append(1 / n ** 2)
```

Exits when there are no more values in **range(25)** for **n** to take on

```
nums = []  
n = 0  
while n < 25:  
    nums.append(1 / n ** 2)  
    n += 1
```

Exits when **(n < 25)** is no longer true

Tracking errors today

Know how to identify **where** and **what** the error is

tinyurl.com/365-errors

IndexError

Traceback (most recent call last)

Cell In[43], line 42

```
39     t += dt
41     # print overall height change
--> 42     print("Total change in height: %0.3f" % (ys[-1] - ys[0]))
44     # plot heights over time
45     plt.scatter(ts, ys)
```

IndexError: list index out of range