APS106

UNIVERSITY OF TORONTO

more while loops.

Week 4 | Lecture 2 (4.2)

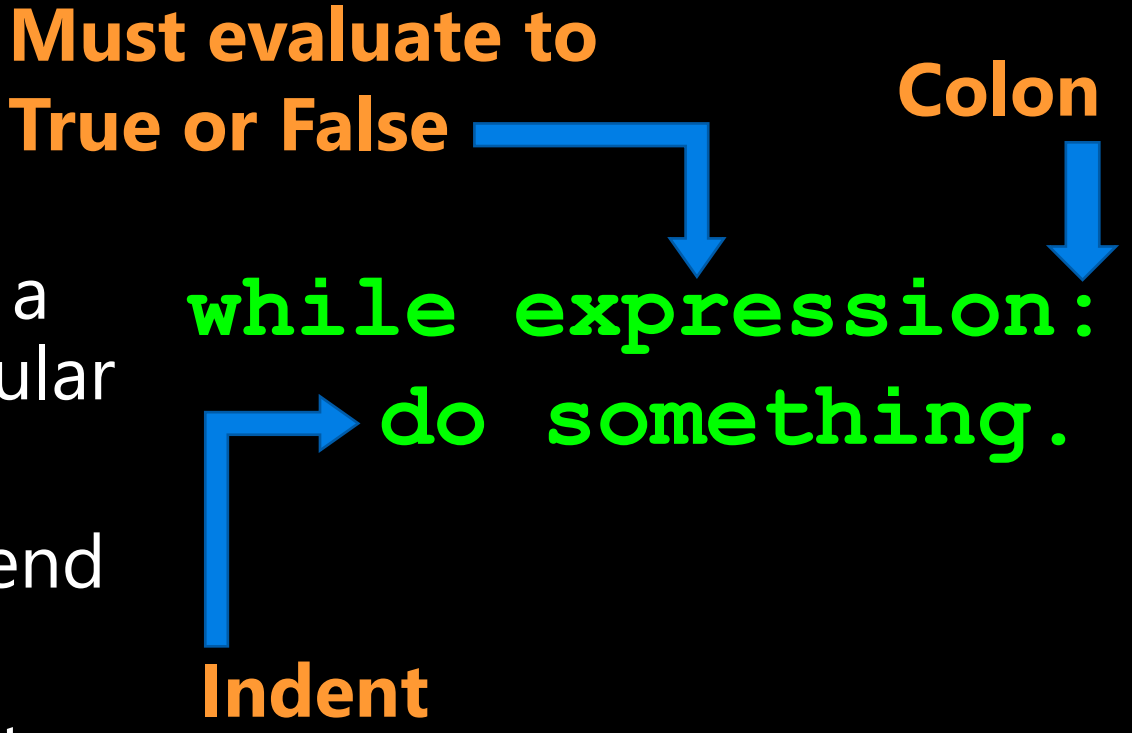
if nothing else, write #cleancode

This Week's Content

- **Lecture 4.1**
  - function review, while loops
  - Reading: Chapter 9
- **Lecture 4.2**
  - **more loops**
  - **Reading: Chapter 9**
- **Lecture 4.3**
  - Midterm Review

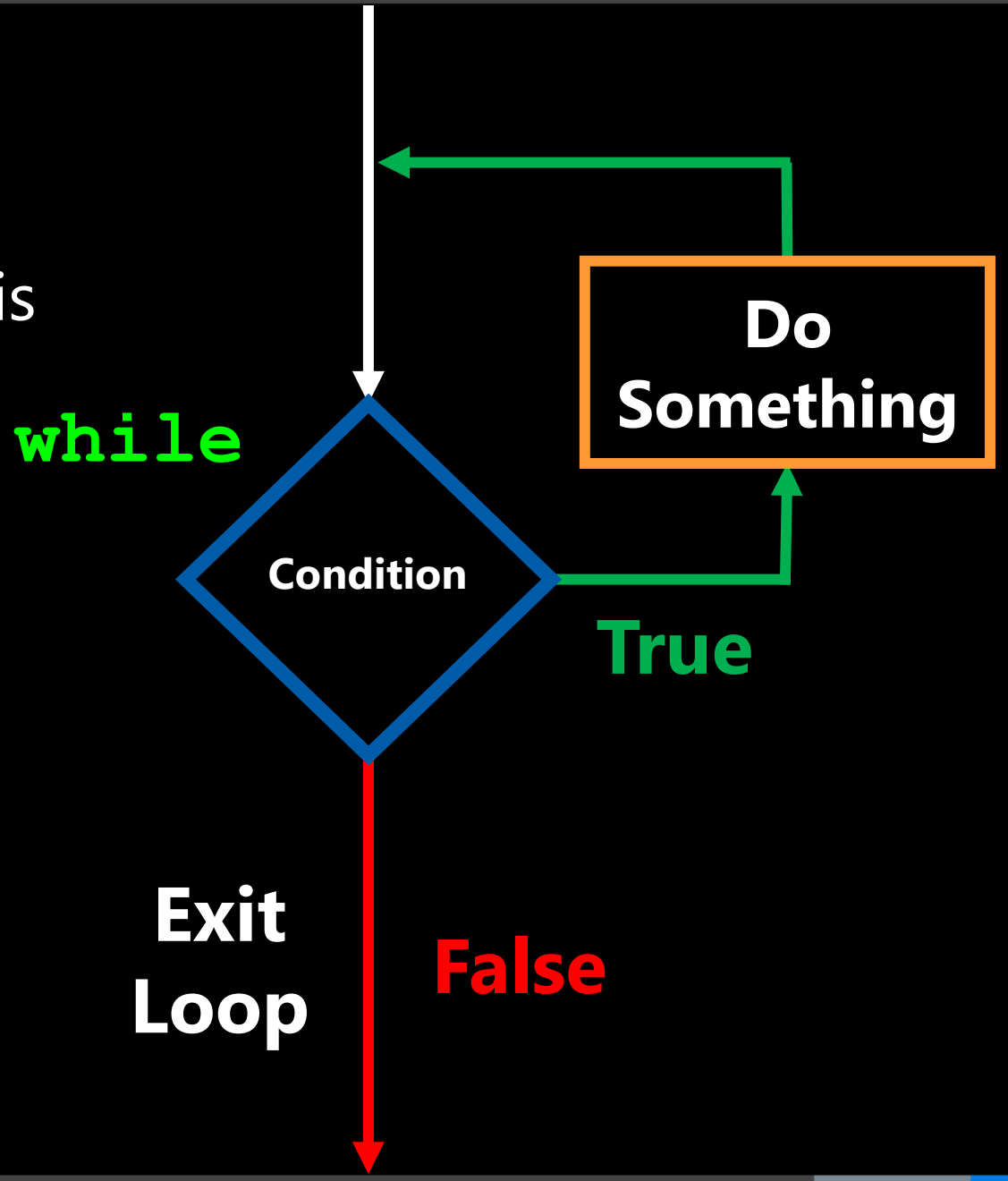
While Loops

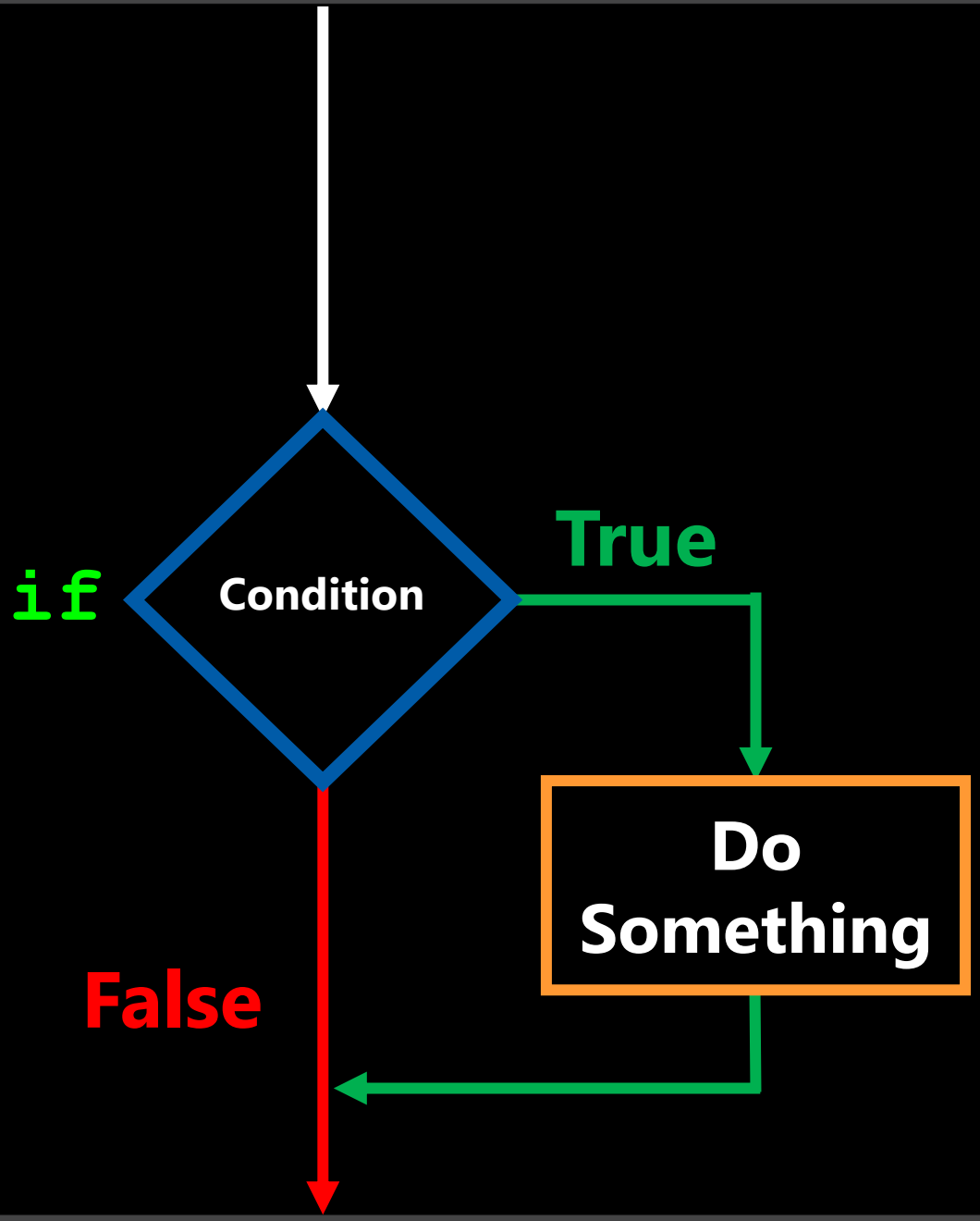
- The **while loop** keeps executing a piece of code as long as a particular condition is **True**.
- There must be a colon (:) at the end of the while statement.
- The action to be performed must be indented.

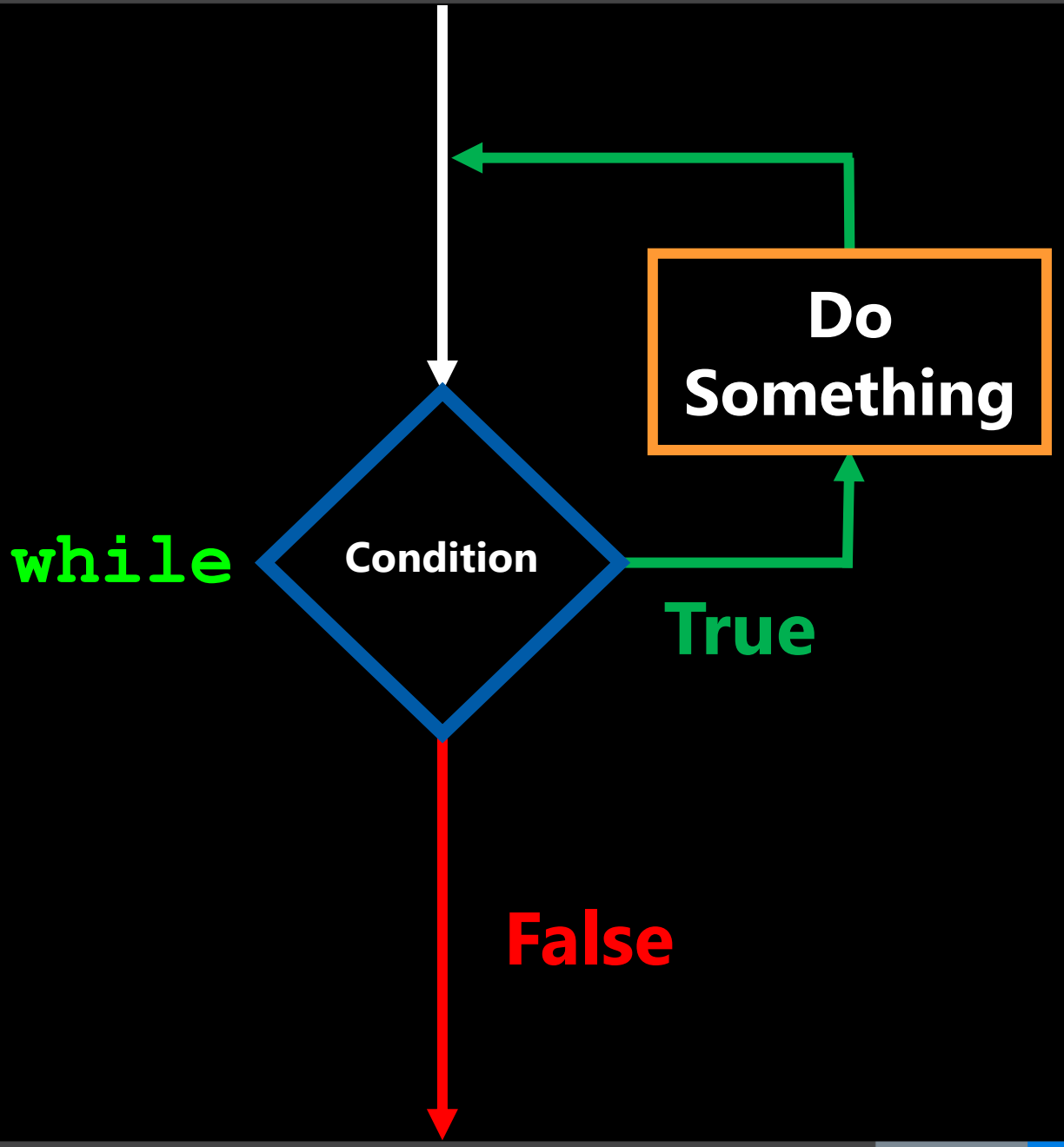


While Loops

- The condition that gets evaluated is just an boolean expression.
- In particular it can include:
  - Something that evaluates to **True** or **False**.
  - logical operators (**and**, **or**, **not**)
  - comparison operators
  - function calls
- … really anything that evaluates to **True** or **False**.




if
Condition
True
Do Something
False


while
Condition
Do Something
True
False

Refresher

- How many printouts will the following **while** loop produce?

```
x = 1
while x < 4:
    print(x)
    x = x + 1
```

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Click Link:
1. Refresher

Refresher

- Just like for **if**-statements, if you use **and** or **or** in a while-loop expression, it is subject to lazy evaluation.
- Only if **x < 4** is **True** will **y < 4** be evaluated. #solazy

```
while x < 4 and y < 4:
    ...
```

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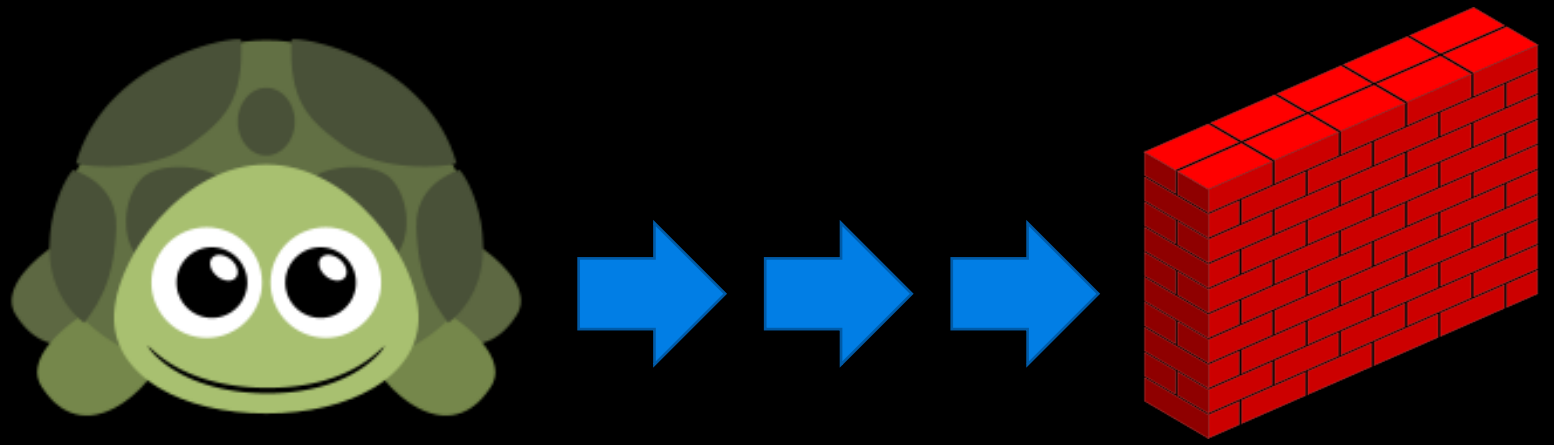
2. Lazy Evaluation

Turtles and `while` loops

- I'm a little turtle and I want to take steps to the right until I get to the brick wall.
- However, I don't know how far away the brick wall I.



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Click Link:
3. Turtles and while loops

Breakout Session 1

- Write code to print all the numbers from 0 to 20 that aren't evenly divisible by either 3 or 5.
- Zero is divisible by everything and should not appear in the output.

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Click Link:
4. Breakout Session 1

Random Module

- This module implements pseudo-random number generators for various distributions.

```
import random

random.uniform()
random.random()
random.randint()
...
```

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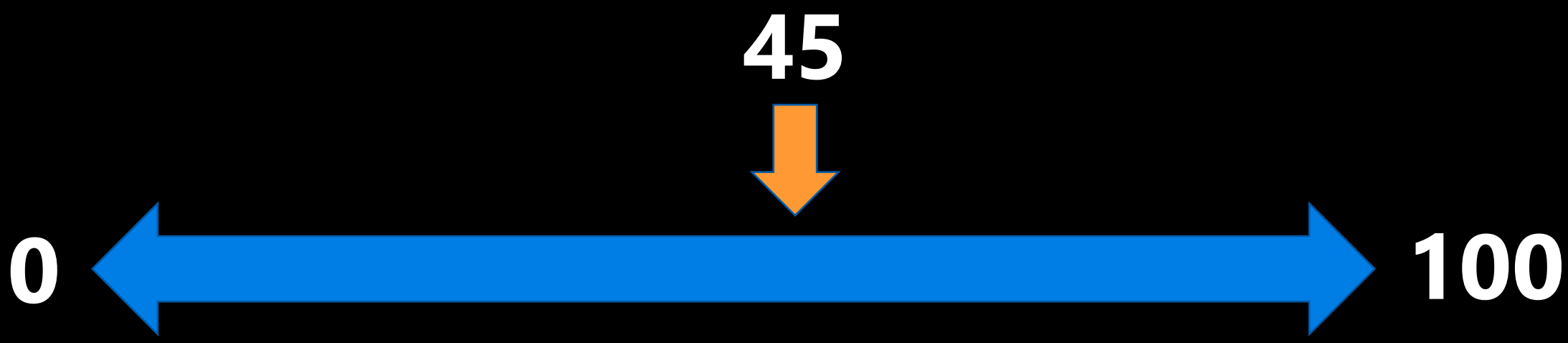
Click Link:
5. Random Module

Guessing Game

- Let's build a simple guessing game.
  - Get the computer to choose a random integer from 0 to 100.
  - Ask the user for a guess and allow the user to input a guess or "q".
  - If the user inputs "q" print a nice message and end the program.
  - If the user enters a guess, tell them if they should guess higher, lower, or if they got it right.
  - If they got it right, print a nice message and quit.

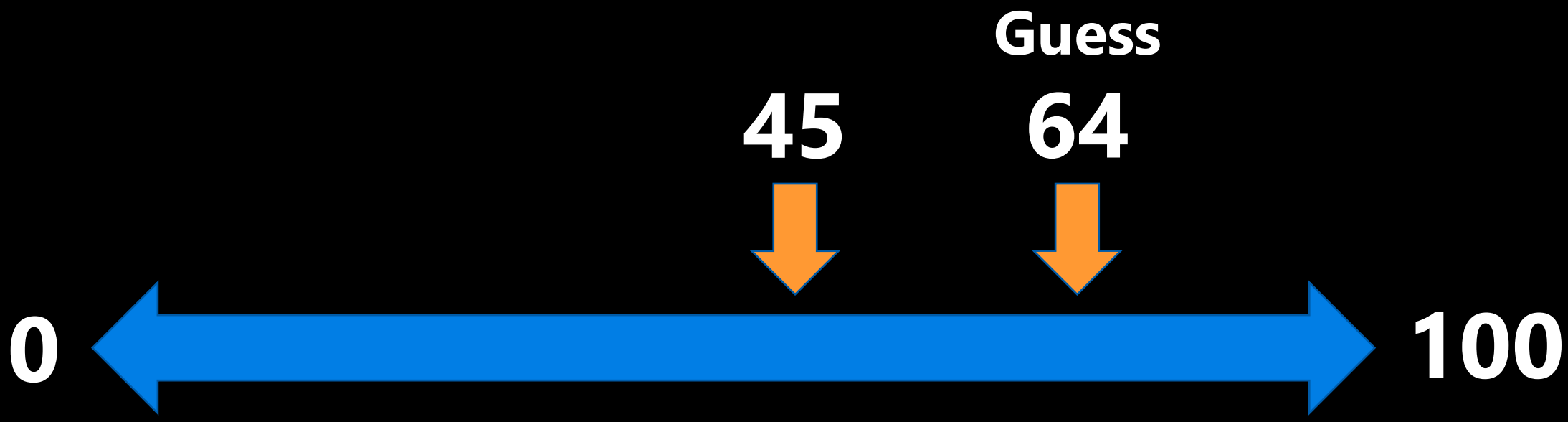
Guessing Game

- Get the computer to choose a random integer from 0 to 100.
  - The computer selects 45.

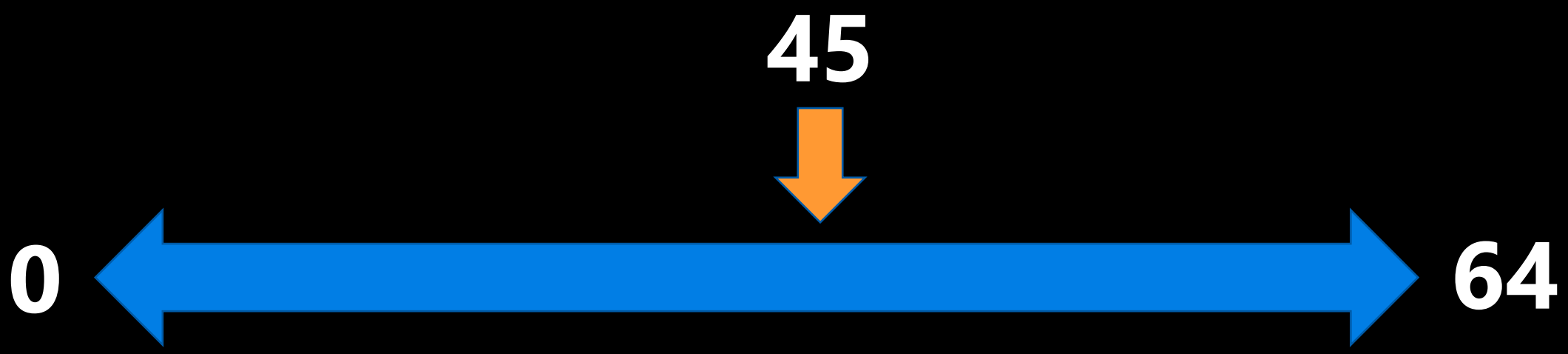


Guessing Game

- The user guesses 64.
  - The computer says **LOWER**.

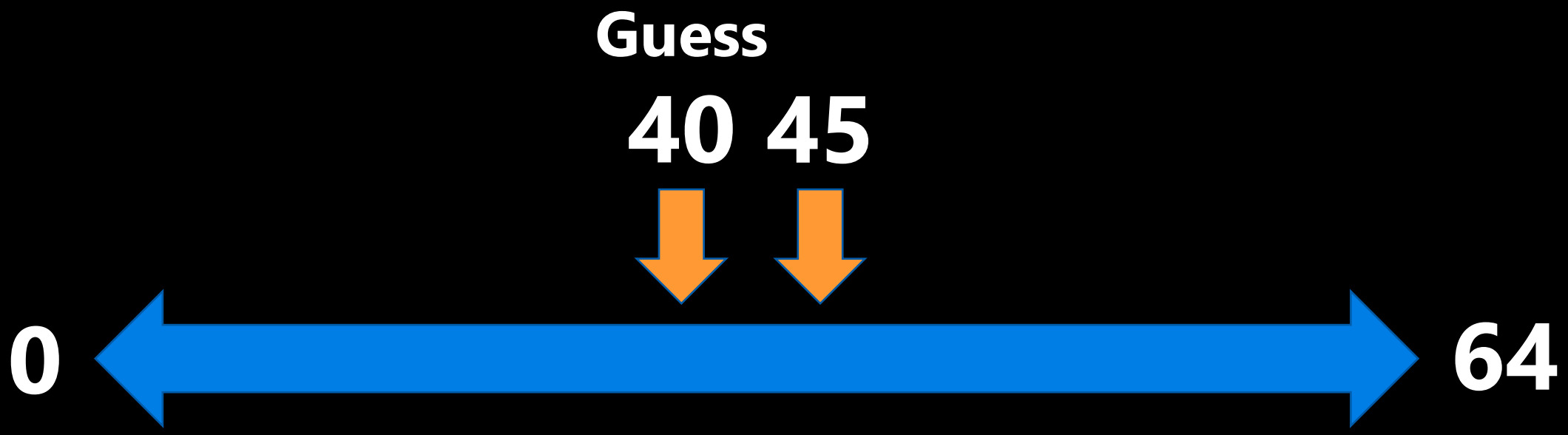


Guessing Game

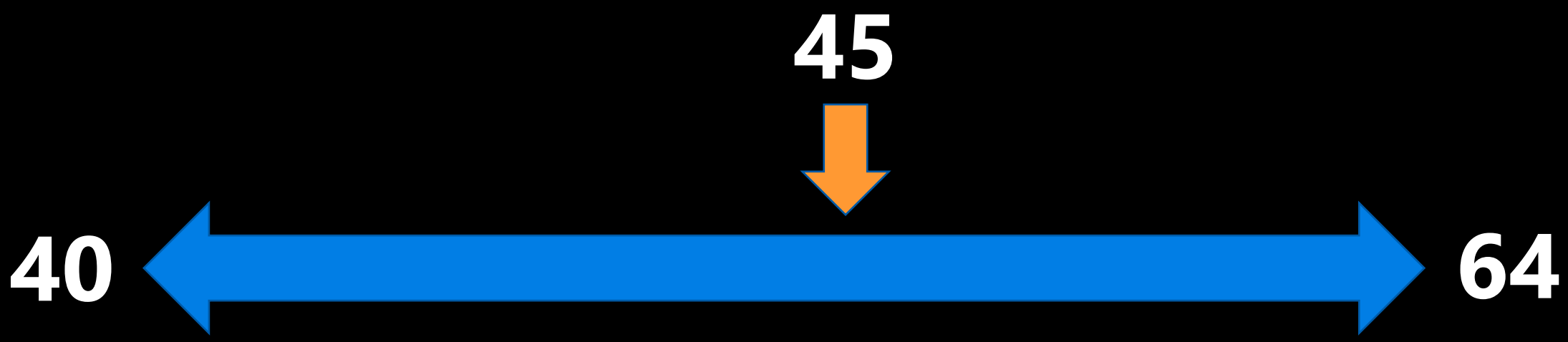


Guessing Game

- The user guesses 40.
  - The computer says **HIGHER**.

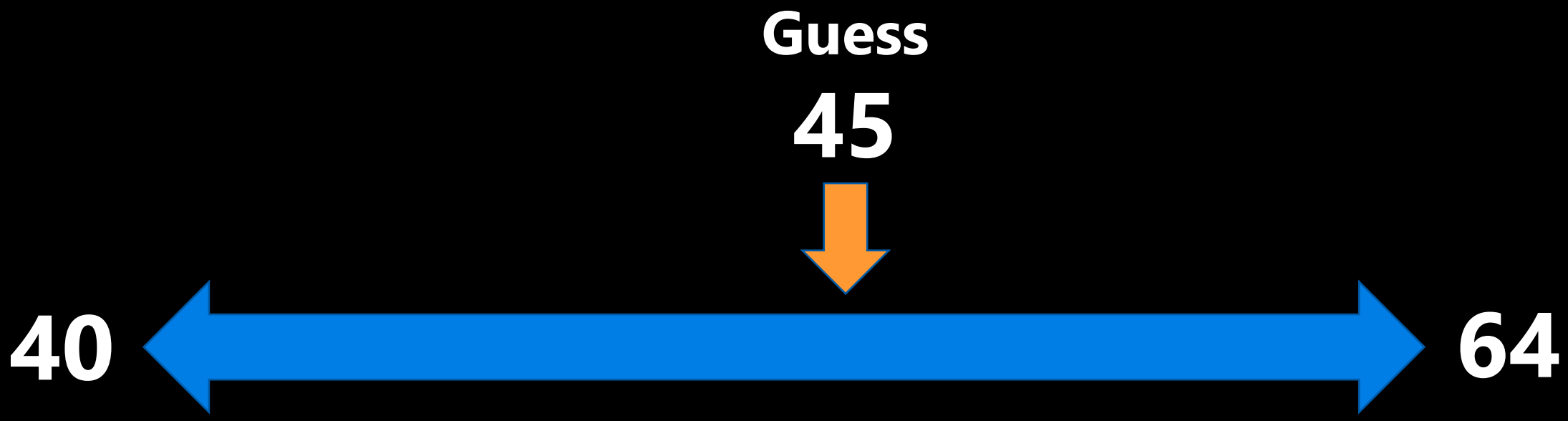


Guessing Game



Guessing Game

- The user guesses 45.
  - The computer says **YOU WIN**.



Guessing Game

- Let's build a simple guessing game.
  1. Get the computer to choose a random integer from 0 to 100.
  2. Ask the user for a guess and allow the user to input a guess or "q".
  3. If the user inputs "q" print a nice message and end the program.
  4. If the user enters a guess, tell them if they should guess higher, lower, or if they got it right.
  5. If they got it right, print a nice message and quit.

Open your notebook

Click Link:
6. A Simple Guessing Game

Lecture Recap

- Looping (aka iteration) is the second key control structure in programming (if-statements/branching was the first).
- The basic idea of loops is to repeated execute the same block code.
- Looping is very powerful idea.
- While loops.

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