print("Hello, World!")
What will we cover?

- Iteration with for loops;
- Looping over a string
- Looping over a range of numbers;
- Comments;
- Loops with the turtle.
What does this cover?

- Design, modify and follow simple algorithms involving sequences of steps, branching, and **iteration (repetition)** (ACTDIP019)
- Implement digital solutions as simple visual programs involving branching, **iteration (repetition)**, and user input (ACTDIP020)
- Implement... **iteration** and functions in a general-purpose programming language (ACTDIP030)
Iteration with for loops
Motivation: Iterating over the letters in a name!

- Imagine we want to read in a person's name, and print out each letter.

```python
name = input('Enter your name? ')
print(name[0])
print(name[1])
print(name[2])
print(name[3])
```

- What are some problems with this?
We want a solution that will work regardless of how long a person’s name is!

```python
name = input('Enter your name? ')
for character in name:
    print(character)
```

The `for` loop runs a code block for each element in a sequence, in this case, character.
Teacher Aside: How does it know what a character is?

- Some students misunderstand the name of the temporary variable that is set (e.g. `for character in name`). It’s worth reiterating that the name of the variable is irrelevant, it’s just a placeholder.
- But then also be prepared for:

  ```python
  for swag in lol:
  ```
Test it out!

Try the first question now!
Looping with numbers
Looping a set number of times

- We can loop a certain, set number of times:
  ```python
  for i in range(3):
    print(i)
  → 0
  → 1
  → 2
  ```

- Notice that `range` starts from zero and goes up to `n - 1` (rather than from 1 to `n`)!
Adding an optional second argument to `range` changes the first number that we count from.

```python
for n in range(3, 6):
    print(n)
→ 3
→ 4
→ 5
```
Teacher Aside! - Think outside the box!

- What would happen if...?
- Now is a good time to have students explore the `range` function, to see if they uncover something in the next few slides for themselves!
We can add an optional third argument to `range` to count the step between the numbers.

```python
for n in range(3, 12, 2):
    print(n)
→ 3
→ 5
→ 7
→ 9
→ 11
```
Putting things together, and negative counting

- We can also combine `range` options together, and use negative numbers.

```python
for n in range(-10, -7, 1):
    print(n)
→ -10
→ -9
→ -8
```
Taking a step backwards

- Using a negative value for the step argument in `range` is a handy way of counting backwards!

```python
for n in range(5, 0, -1):
    print(n)
→ 5
→ 4
→ 3
→ 2
→ 1
```
Test it out!

Try the second question now!
3 Comment your code!
Adding comments to your code

- You can add comments to your code, - notes to remind you what your code does.
- In Python, start your comments with a hash (#)
  
  # This is a comment, it does nothing.

- Comments are a very good habit to get into from the start!
Teacher Aside!

- It’s hard to write many interesting programs without input from the user, so almost all of our questions use input.
- Using input is one of the hardest concepts for students to grasp. It often helps to act it out with a memory diagram, or writing on a piece of paper.
More Python Turtle!
As normal, let’s jump in and get started!
Any Questions?

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