WHAT ARE PYTHON LISTS?

- A list is a collection of elements.
- Lists can contain any data type: integers, strings, booleans, etc.
- Key Characteristics:
- - Ordered
- - Mutable (can be changed)
- - Can contain duplicate values.

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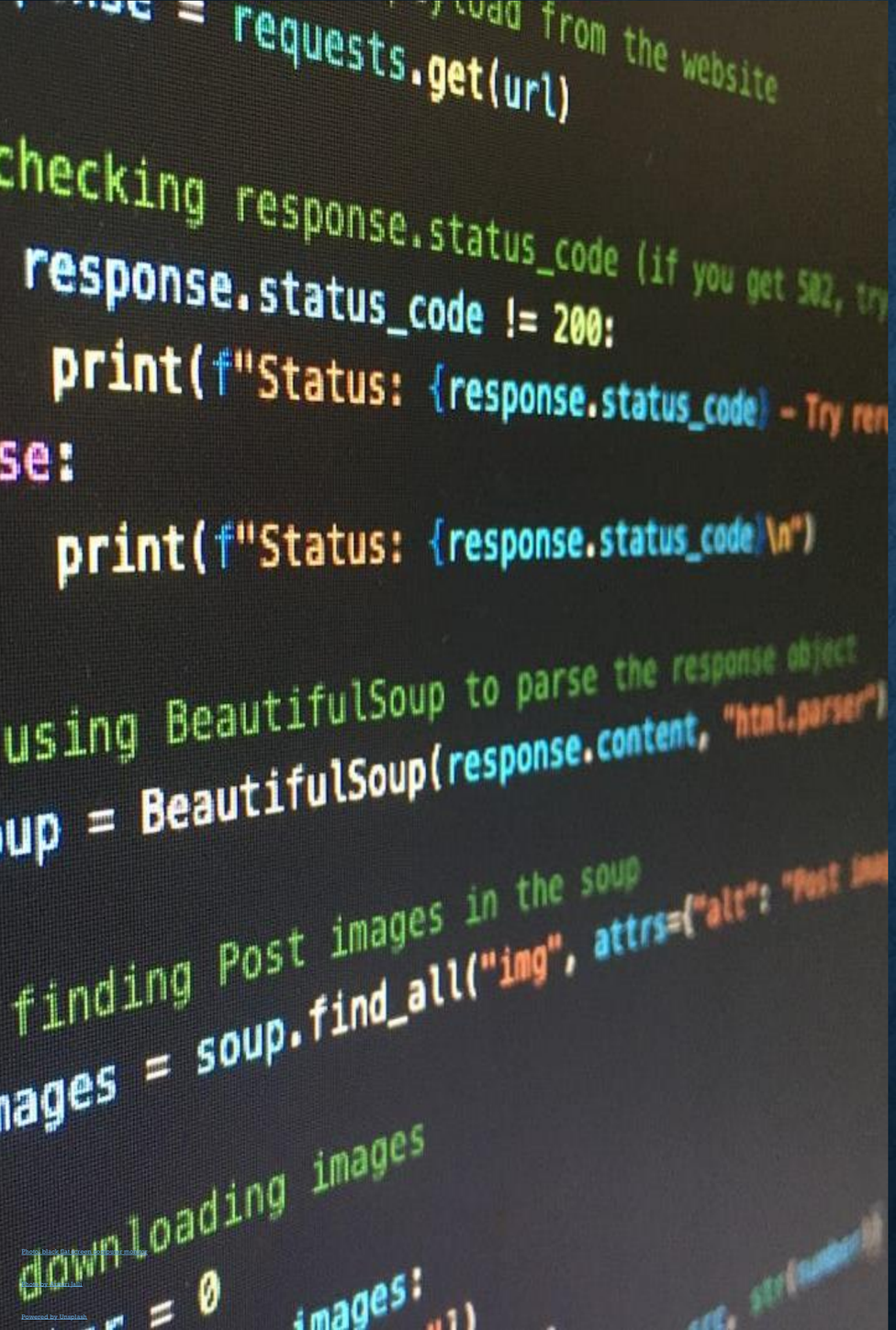
SYNTAX EXAMPLE: CREATING A LIST

- Lists are created using square brackets [].
- Example:
- ```python
  a = [1, 2, 3]
  print(a)  # Output: [1, 2, 3]
  print(type(a))  # Output: <class 'list'>
  ```
- Here, `a` is a list with three elements.
  ```



ACCESSING SINGLE VALUES

- Use index to access individual elements.
- Indexing starts from 0.
- Example:
- ```python
  print(a[0])  # Output: 1
  print(a[1])  # Output: 2
  ```
  ```

LISTS WITH DIFFERENT DATA TYPES

- Lists can hold different data types.
- Example:
- ```python
  marks = [3, 4, 5, 6, "Harry", True, 45.6]
  ```
- This list contains integers, strings, booleans, and floats.

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  ```

ACCESS BY POSITIVE & NEGATIVE INDEX

- Positive Index: Starts from 0 (left to right).
- Negative Index: Starts from -1 (right to left).
- Examples:
- ```python
  print(a[0])  # Output: 1
  print(a[-1])  # Output: 3
  ```


  ```

CHECKING IF VALUE EXISTS IN LIST

- Use `in` keyword to check for existence of a value.
- Example:
- ```python
  a = [1, 2, 3]
  if 1 in a:
      print("Found")
  else:
      print("Not Found")
  ```

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Photo: laptop computer showing codes

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LIST SLICING (RANGE)

- Access a range of elements using slicing.
- Syntax: `list[start:stop:step]`
- Examples:
- ```python
  print(a[0:2])  # Output: [1, 2]
  print(a[1:])   # Output: [2, 3]
  print(a[::2])  # Output: [1, 3]
  ```
  ```

LIST COMPREHENSION

- Concise way to create lists.
- Examples:
- ```python
  lst = [i for i in range(4)]
  print(lst)  # Output: [0, 1, 2, 3]

  lst = [i*i for i in range(4)]
  print(lst)  # Output: [0, 1, 4, 9]

  lst = [i*i for i in range(4) if i%2 == 0]
  print(lst)  # Output: [0, 4]
  ```

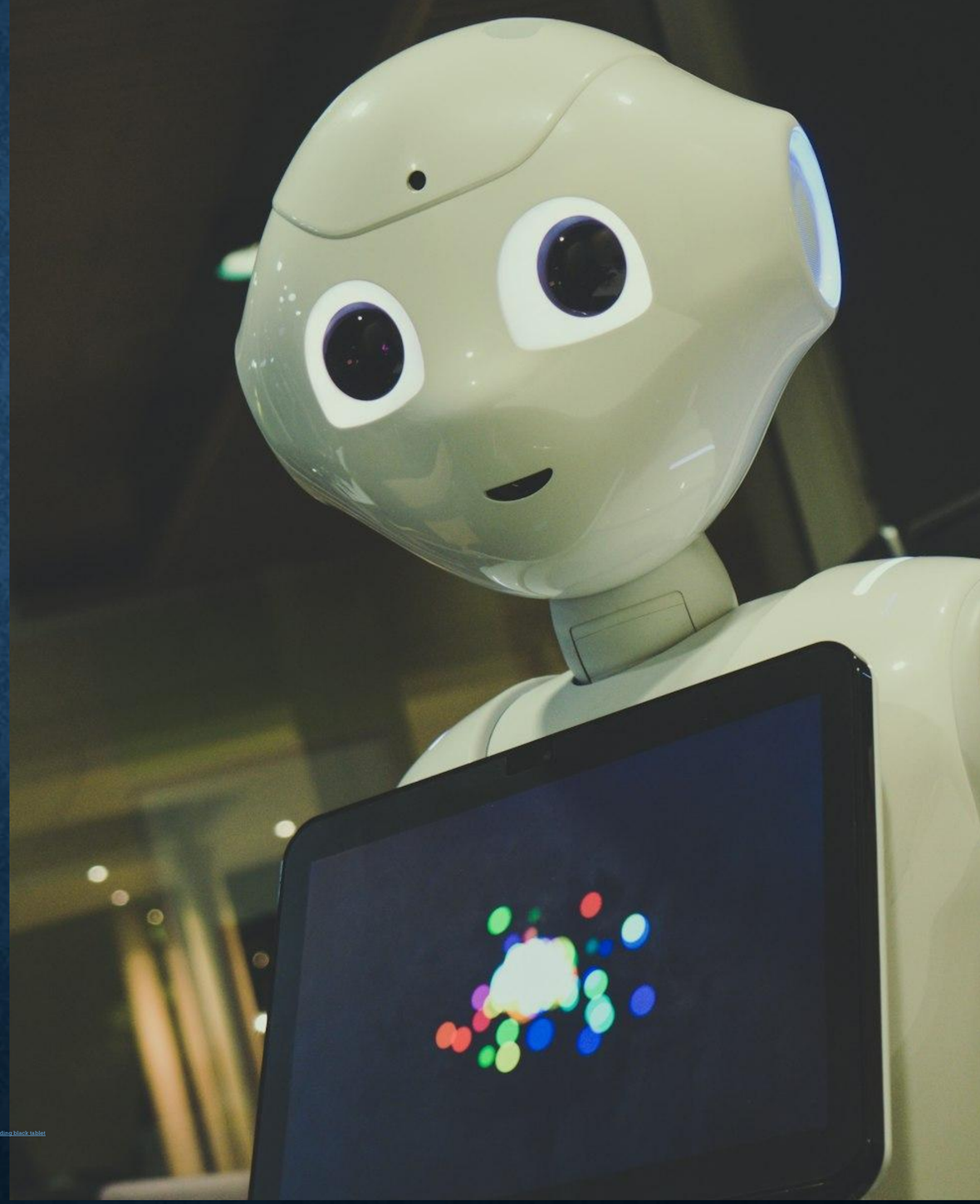

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Photo: white robot toy holding black tablet

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USING LIST CONCATENATION (WITHOUT FUNCTIONS):

- a = [1, 2, 3]
- a = a + [4] # Add 4 to the list
- print(a) # Output: [1, 2, 3, 4]

- a = a + [5, 6] # Add multiple elements to the list
- print(a) # Output: [1, 2, 3, 4, 5, 6]

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USING MULTIPLICATION FOR REPETITION

- a = [1, 2]
- a = a * 2 # Repeating the list twice
- print(a)   # Output: [1, 2, 1, 2]