Python

Full stack Skills Bootcamp

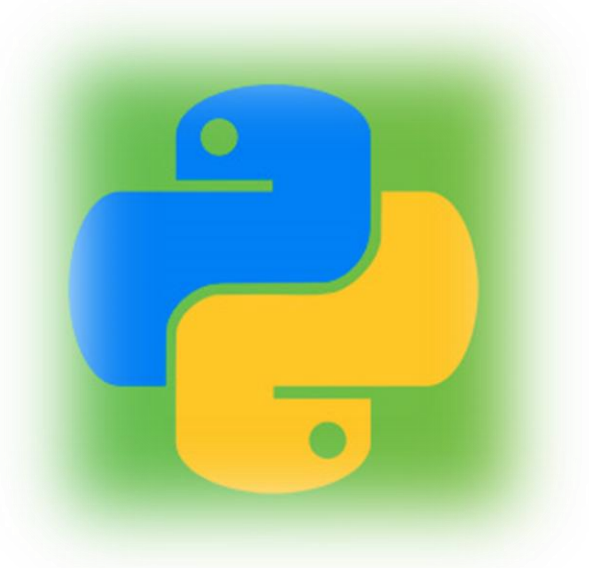
Introducing Python Tuples

- ## What are tuples?

  A tuple is an immutable, fixed-size sequence of data in Python. Once created, tuple elements cannot be modified, unlike lists. Useful for storing collections of heterogeneous, constant data.

- ## Why use tuples?

  Immutability ensures data consistency. They are faster and use less memory than lists. Frequently used for fixed-size collections (e.g., coordinates, configuration data).



Creating a Tuple

- Initialization

```python
my_tuple = (1, 2, 3, 4, 5)
print("Original Tuple:", my_tuple)
```

- This creates a tuple called my_tuple containing five integers.
- Tuples are often used for storing collections of items that are fixed and should not change.

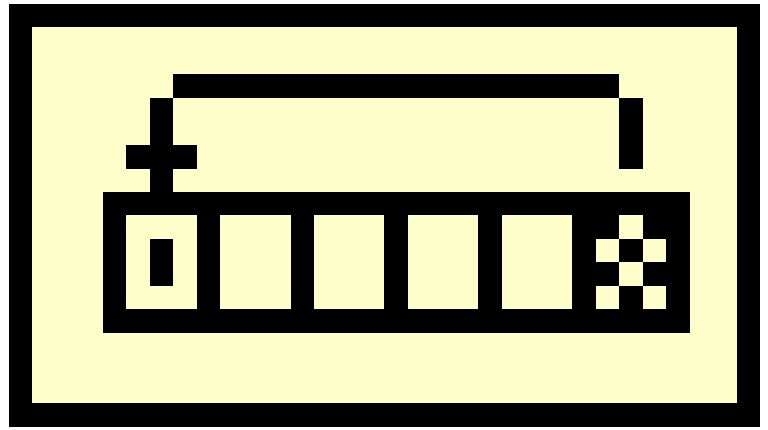
Accessing Tuple Elements

Accessing Elements

Elements are accessed using their index, like lists.

```python
print("First Element:", my_tuple[0])  # Output: First Element: 1
print("Last Element:", my_tuple[-1])  # Output: Last Element: 5
```

- The first element can be accessed using index 0.
- Negative indexing allows access to elements from the end of the tuple



Slicing Elements

- Creating Sub-tuples

  Slicing creates a new tuple from a portion of the original tuple.

```python
sub_tuple = my_tuple[1:4]  # Get elements from index 1 to 3
print("Sliced Tuple (index 1 to 3):", sub_tuple)  # Output: (2, 3, 4)
```

This demonstrates how to extract a sub-tuple using slice notation.

Comparison with Lists

Lists vs Tuples

Lists are mutable sequences that can be modified after creation.

Key Differences

- Lists allow changes, while tuples do not.
- Tuples are generally preferred for fixed collections, whereas lists are used for collections that may need to change

```python
my_list = [1, 2, 3, 4, 5]
print("Original List:", my_list)
my_list[1] = 10
print("Modified List:", my_list)  # Output: Modified List: [1, 10, 3, 4, 5]
```

Conclusion

- Tuples provide a way to store immutable collections of items.
- Understanding how to create, access, and manipulate tuples is essential for effective Python programming.