

1. What is the difference between an integer and a float in Python?

Explanation:

- Integer: Whole number, no decimal. Example: num1 = 10

- Float: Number with decimal. Example: num2 = 10.5

Output:

Integer: 10

Float: 10.5

2. How do you declare a string variable in Python?

String: Sequence of characters. Example: greeting = "Hello, World!"

String operation: greeting.upper()

Output: HELLO, WORLD!

3. What is a list in Python?

List: Ordered, mutable collection. Access with index.

Example: fruits = ['apple', 'banana', 'cherry']

Access: fruits[1] -> 'banana'

Modify: fruits[1] = 'mango' -> ['apple', 'mango', 'cherry']

4. Difference between tuple and list:

- List: Mutable. Example: my_list = [1, 2, 3]

- Tuple: Immutable. Example: my_tuple = (1, 2, 3)

5. Create and access dictionary:

Example: student = {'name': 'Ali', 'age': 20}

Access: student['name'] -> Ali

6. Type casting in Python:

- Implicit: `x = 5, y = 2.0 -> z = x + y -> z = 7.0`
- Explicit: `a = '10', b = int(a) + 5 -> b = 15`

7. Convert string to integer and arithmetic:

```
num_str = "25", num_int = int(num_str)
```

```
result = num_int + 10 -> Output: 35
```

8. Concatenate strings:

```
Example: first_name = "Muhammad", last_name = "Abubakar"
```

```
full_name = first_name + " " + last_name
```

```
Output: Muhammad Abubakar
```

9. Indexing in lists and strings:

```
List: colors = ['red', 'green', 'blue'] -> colors[0] = 'red', colors[-1] = 'blue'
```

```
String: text = "Python" -> text[1] = 'y', text[-2] = 'o'
```

10. Dictionary with student names and ages:

```
students = {'Ali': 20, 'Ahmed': 22, 'Sara': 19}
```

```
Access: students['Ahmed'] -> Output: 22
```