Day 2: Python Basics – Notes and Exercises

1. Input and Output in Python

- **Input:** Use input() to take user input; always returns a string.
  - **Tip:** Convert strings to integers with int() or to floats with float().
  - **Example:**

```
name = input("Enter your name: ")
print(f"Hello, {name}!")

# Working with numbers
age = int(input("Enter your age: "))
print(f"Next year, you will be {age + 1} years old.")
```

- **Output:** Use print() to display information.
  - **Formatting:** Use f-strings or .format() method.
  - **Example:**

```
age = 24
print(f"I am {age} years old.")  # Using f-string
print("I am {} years old.".format(age))  # Using .format()
```

2. Basic String Operations

INDEX	0	1	2	3	4	5	6
STRING	T	H	A	P	E	L	O

- **Strings:** Sequences of characters in single ‘ ’ , double “ ”, or triple ‘’’ ‘’’ quotes.
- **Concatenation:** Join strings using +.
  - **Example:**

```
first_name = "Thapelo"
last_name = "Mahloko"
full_name = first_name + " " + last_name
print(full_name)  # Output: Thapelo Mahloko
```

- **Repetition:** Duplicate strings using *.
  - **Example:**

```
print("Python! " * 3)  # Output: Python! Python! Python!
```

- **Indexing:** Access characters using indices (starting from 0).
  - **Example:**

```
name = "Python"
print(name[0])  # Output: P (first character)
print(name[-1])  # Output: n (last character)
```

- **Slicing:** Extract portions using [start:end:step].
  - **Tip:** Omit start or end for defaults.
  - **Example:**

```
word = "programming"
print(word[0:4])  # Output: prog
print(word[4:])   # Output: ramming
print(word[::-1]) # Output: Reverse of the string
```

3. String Methods

- **Change Case:**
  - upper() for uppercase, lower() for lowercase.
  - **Example:**

```
print("Python".upper())  # Output: PYTHON
print("PYTHON".lower())  # Output: python
```

- **Trim Whitespace:** Use strip() to remove spaces.
  - **Example:**

```
print("  Hello  ".strip())  # Output: Hello
```

- **Replace Substrings:** Use replace().
  - **Example:**

```
sentence = "I love cats."
print(sentence.replace("cats", "dogs"))  # Output: I love dogs.
```

- **Find Substrings:** Use find().
  - **Example:**

```
print("programming".find("gram"))  # Output: 3
```

- **Length of a String:** Use len().
  - **Example:**

```
print(len("Python"))  # Output: 6
```

4. String Formatting

- **f-strings (Python 3.6+):** Insert variables into strings.
  - **Example:**

```
name = "Thapelo"
age = 24
print(f"My name is {name} and I am {age} years old.")
```

- **format() Method:**
  - **Example:**

```
print("My name is {} and I am {} years old.".format(name, age))
```

Exercises for Day 2

1. **String Concatenation:** Combine first and last name.
2. **String Indexing:** Print first, last, and middle character of a word.
3. **String Slicing:** Print first 5, last 5 characters, and slice from index 3 to 8 of a quote.
4. **String Methods:** Input a string and output uppercase, lowercase, trimmed version, and length.
5. **Password Masking:** Hide password characters while displaying its length.
6. **Word Replacement:** Replace occurrences of a word in a sentence.
7. **String Formatting:** Take user input for name, age, and favorite hobby, then print an introduction.