TASK 1

String Handling in Python

# 1. Introduction to Strings

In Python, a string is a sequence of characters enclosed in single (' '), double (" "), or triple (''' ''' or """ """) quotes. Strings are immutable, meaning they cannot be changed after creation. Python offers powerful tools to work with strings efficiently.

# 2. Creating Strings

Strings can be created using:  
 - Single quotes: 'Hello'  
 - Double quotes: "World"  
 - Triple quotes: '''Python''' or """Python""" (useful for multi-line strings)  
  
Example:  
 str1 = 'Hello'  
 str2 = "World"  
 str3 = '''This is a  
multi-line string'''

# 3. String Operations

Python allows various operations on strings:  
 - Concatenation: 'Hello' + ' World' = 'Hello World'  
 - Repetition: 'Hi' \* 3 = 'HiHiHi'  
 - Indexing: str[0] returns first character  
 - Slicing: str[1:4] returns substring from index 1 to 3

# 4. String Methods

Python provides many built-in methods for strings:  
 - lower(), upper(), title(), capitalize(), strip()  
 - find(), replace(), split(), join(), startswith(), endswith()  
Example:  
 'hello'.upper() returns 'HELLO'  
 'hello world'.split() returns ['hello', 'world']

# 5. String Formatting

Python supports several ways of formatting strings:  
 - f-strings (Python 3.6+): name = 'John'; f"Hello {name}"  
 - format(): 'Hello {}'.format(name)  
 - % operator: 'Hello %s' % name

# 6. Escape Characters

Escape characters are used to insert characters that are illegal in a string:  
 - \n: Newline  
 - \t: Tab  
 - \\: Backslash  
 - \": Double Quote  
Example:  
 print("Hello\nWorld") outputs:  
Hello  
World

# 7. String Immutability

Strings in Python are immutable. Once created, their characters cannot be changed. To modify a string, you must create a new one.  
  
Example:  
 s = 'hello'  
 s[0] = 'H' # This will raise an error  
 s = 'H' + s[1:] # This creates a new string 'Hello'

# 8. Conclusion

String handling in Python is intuitive and powerful. With built-in methods and operations, you can perform complex text manipulations easily. Mastering string handling is essential for any Python developer.