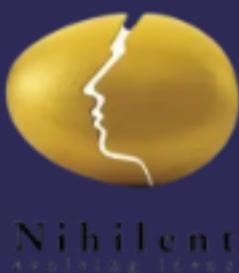


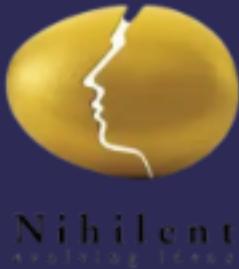
Day 2: Python Fundamentals

- String Operations: Immutability, accessing, slicing, and methods
- Conditional Statements: Utilizing `if`, `elif`, and `else`
- Logical and Membership Operators: Simplifying conditions
- String Manipulation: Uncovering hidden messages, case conversion, trimming
- List Manipulation Techniques: Mutability, combining, slicing, sorting
- `.split()` Method: Dividing strings into lists, handling new lines
- Unscrambling Sentences: Correcting scrambled messages step-by-step
- Loops in Python: `while` and `for` loops, list comprehension



String Literals in Python

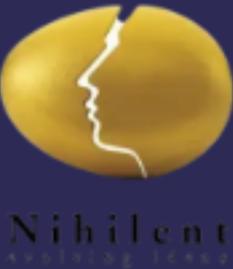
Immutable sequences of characters that cannot be changed once created.



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Accessing Characters

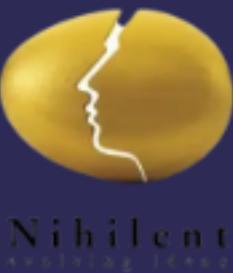
```
quote = "I love python"  
print(quote[0]) # Output: I  
print(quote[2]) # Output: l
```



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Accessing Characters

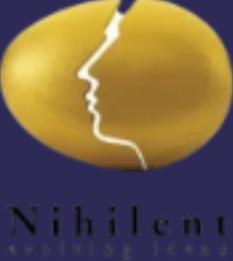
```
quote = "I love python"  
# Demonstrating character access by index  
print(quote[0]) # Output: I  
print(quote[2]) # Output: l
```



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Immutability of Strings

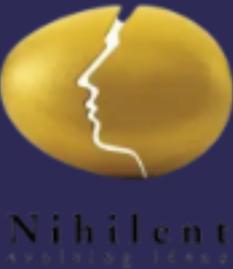
```
quote = "I love python"  
# quote[2] = 'x' # Uncommenting this will raise an error
```



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Immutability of Strings

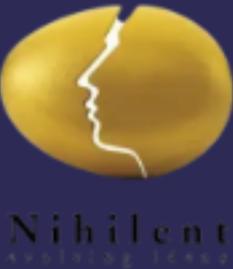
```
quote = "I love python"  
# Python strings are immutable  
# Attempting to directly modify them will raise an error
```



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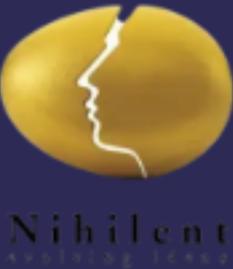
String Methods

```
quote = "I love python"  
print(quote.upper()) # Output: I LOVE PYTHON  
print(quote)         # Output: I Love python
```



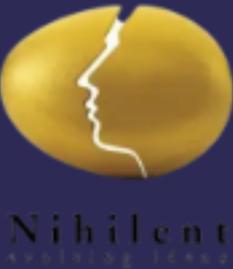
String Methods

```
quote = "I love python"  
# Using string methods does not change the original string  
upper_quote = quote.upper()  
print(upper_quote) # Output: I LOVE PYTHON  
print(quote)       # Output: I Love python
```



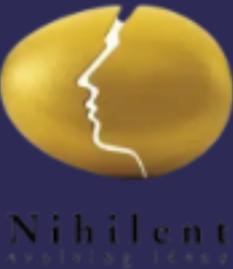
Slicing Operator

```
quote = "I love python"  
print(quote[2:6]) # Output: Love  
print(quote[7:]) # Output: python
```



Slicing Operator

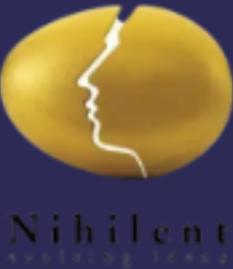
```
quote = "I love python"  
# Using slicing to extract parts of the string  
slice1 = quote[2:6] # love  
slice2 = quote[7:] # python  
print(slice1)  
print(slice2)
```



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Advanced Slicing

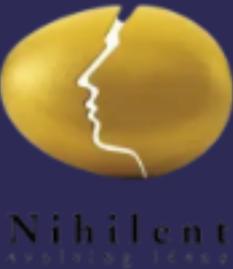
```
quote = "I love python"
print(quote[-1])      # Output: n
print(quote[-6:])     # Output: python
print(quote[::-3])    # Output: Ilphn
```



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Advanced Slicing

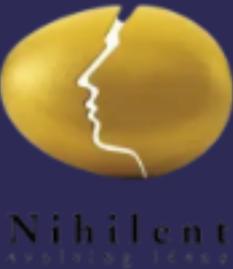
```
quote = "I love python"
# Exploring advanced slicing features
reverse_first_char = quote[-1]
substring = quote[-6:]
skip_characters = quote[::3]
print(reverse_first_char) # n
print(substring)         # python
print(skip_characters)   # Ilphn
```



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Reversing a String

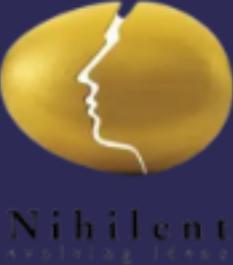
```
quote = "I love python"  
print(quote[::-1]) # Output: nohtyp evol I
```



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Reversing a String

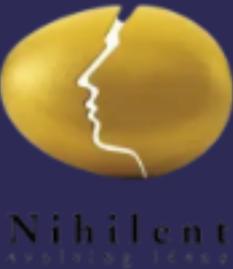
```
quote = "I love python"  
# Reversing the string using slicing  
reversed_quote = quote[::-1]  
print(reversed_quote) # Output: nohtyp evol I
```



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Summary and Conclusion

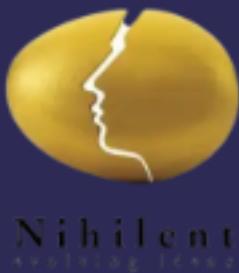
- Python strings are powerful and flexible.
- Operations like slicing and accessing individual characters are straightforward.
- Despite their immutability, strings in Python can be manipulated using various methods to create new string values.



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Python String Methods

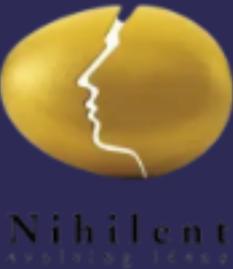
Exploring the versatility and power of string manipulation in Python.



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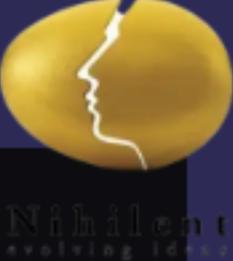
Basic String Operations

```
msg = "Hi, all"
print(msg.upper())    # HI, ALL
print(msg.lower())    # hi, all
print(msg.title())    # Hi, ALL
print(msg.capitalize()) # Hi, all
```



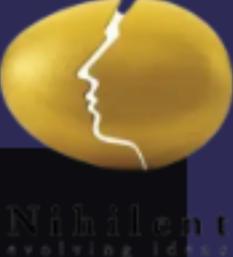
Trimming Whitespace

```
quote = "      Dream... you sleep"
trimmed_quote = quote.strip()
print(trimmed_quote) # Dream... you sleep
```



Stripping Specific Characters

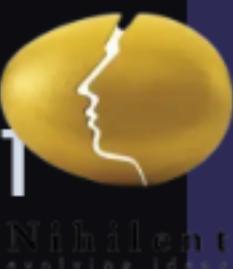
```
quote1 = "---Dream... sleep---"
print(quote1.strip("-")) # Dream... you sleep
print(quote1.lstrip("-")) # Dream... you sleep---
print(quote1.rstrip("-")) # ---Dream... you sleep
```



Finding Substrings

```
quote3 = "Dream... you sleep"  
print(quote3.find('something')) # 20  
print(quote3.find('Dream')) # 0  
print(quote3.find('**')) # -1
```

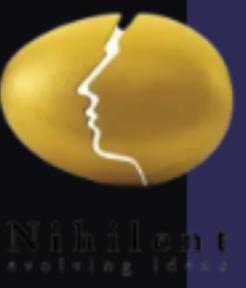
The `.find()` method is used to locate substrings within a string, returning the index of the first occurrence or -1 if not found.



Immutable Strings and Replacement

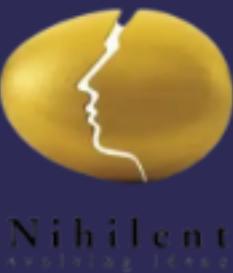
```
quote3 = "Dream... you sleep"  
new quote = quote3.replace("Dream", "👉")  
print(new quote) #👉... you sleep  
print(quote3) # Original string is unchanged
```

Highlighting string immutability with `.replace()`, showing how original strings remain unchanged after modifications.



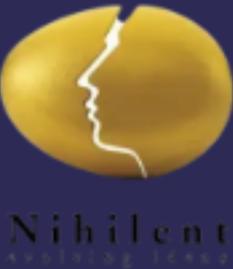
Counting, Validating, and Length

```
quote3 = "Dream... you sleep"
print(quote3.count("Dream")) # 2
print(quote3.startswith("Dream")) # True
print(quote3.endswith("sleep")) # True
bage_no = "45445"
print(bage_no.isdigit()) # True
name = "ark"
print(name.islower()) # True
print(len(name)) # 3
```



Conditionals in Python

Understanding how to make decisions in your code with `if`, `elif`, and `else` statements.

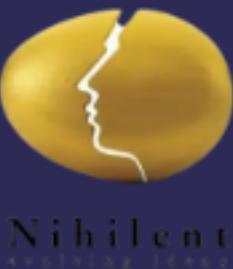


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Basic Comparison

```
# Example of a simple comparison
number1 = 5
number2 = 10

if number1 > number2:
    print("number1 is greater")
else:
    print("number2 is greater")
```

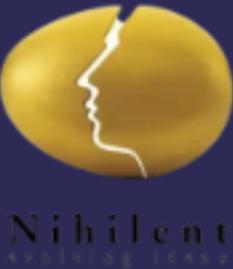


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Basic Comparison

```
number1 = 5
number2 = 10

# Comparing two numbers and printing the result
if number1 > number2:
    print("number1 is greater")
else:
    print("number2 is greater")
```

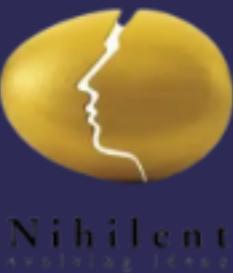


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Handling Equal Values

```
# Checking for equality
number1 = 10
number2 = 10

if number1 > number2:
    print("number1 is greater")
elif number1 == number2:
    print("Both numbers are equal")
else:
    print("number2 is greater")
```

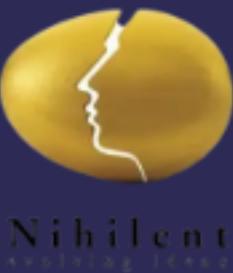


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Handling Equal Values

```
number1 = 10
number2 = 10

# Using elif to handle equal values
if number1 > number2:
    print("number1 is greater")
elif number1 == number2:
    print("Both numbers are equal")
else:
    print("number2 is greater")
```

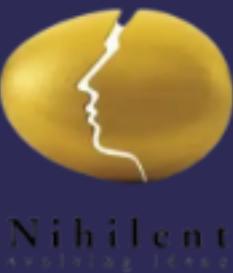


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Applying Conditionals to User Input

```
person1 = input('Please give your name: ')
height1 = int(input("Provide your height in cm: "))
person2 = input('Please give your name: ')
height2 = int(input("Provide your height in cm: "))

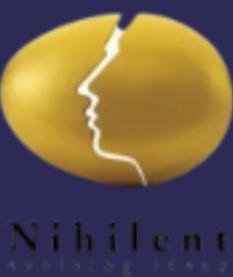
if height1 > height2:
    print(f'{person1} is taller')
elif height1 == height2:
    print(f'{person1} and {person2} have the same height')
else:
    print(f'{person2} is taller')
```



Applying Conditionals to User Input

```
person1 = input('Please give your name: ')
height1 = int(input("Provide your height in cm: "))
person2 = input('Please give your name: ')
height2 = int(input("Provide your height in cm: "))

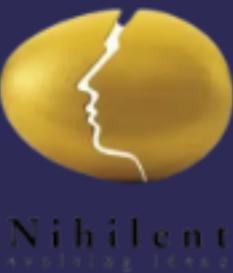
# Implementing conditional Logic based on user input
if height1 > height2:
    print(f'{person1} is taller')
elif height1 == height2:
    print(f'{person1} and {person2} have the same height')
else:
    print(f'{person2} is taller')
```



Understanding elif and else

```
# Demonstration of elif and else
choice = input("Choose one option: A, B, or C: ")

if choice == 'A':
    print("You chose A.")
elif choice == 'B':
    print("You chose B.")
else:
    print("You chose C.")
```

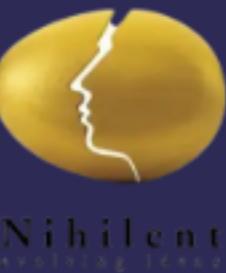


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Understanding elif and else

```
choice = input("Choose one option: A, B, or C: ")

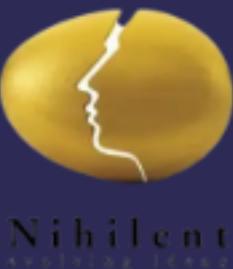
# Explaining the use of elif for multiple conditions and else for the final default condition
if choice == 'A':
    print("You chose A.")
elif choice == 'B':
    print("You chose B.")
else:
    print("You chose C.")
```



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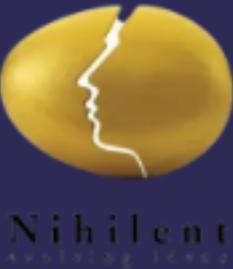
Summary and Conclusion

- Python's `if`, `elif`, and `else` statements provide a powerful way to control the flow of your program based on conditions.
- `elif` allows for multiple conditions to be checked sequentially
- `else` serves as a catch-all for any cases not covered by preceding `if` or `elif` statements.



Ice Cream Stock Checker

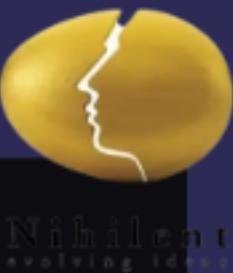
Learning to use conditional statements and operators in Python for practical problem-solving.



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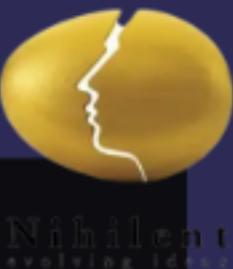
```
# Initial approach with multiple if/elif statements
fav_flavour = input("Please tell me your flavour: ")
stock1 = "vanilla"
stock2 = "lime"
stock3 = "chocolate"

if fav_flavour == stock1:
    print("Yes, we do have it")
elif fav_flavour == stock2:
    print("Yes, we do have it")
elif fav_flavour == stock3:
    print("Yes, we do have it")
else:
    print("No, we ran out of stock")
```



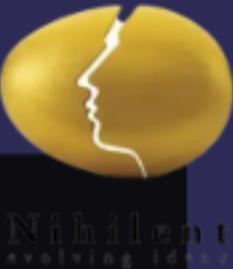
```
# Simplified approach using Logical OR
fav_flavour = input("Please tell me your flavour: ")

if fav_flavour == "vanilla" or fav_flavour == "lime" or fav_flavour == "chocolate":
    print("Yes, we do have it")
else:
    print("No, we ran out of stock")
```



```
shop_stock = "vanilla, lime, chocolate"
fav_flavour = input("Please tell me your flavour: ")

# Using the Logical OR to simplify the condition
if fav_flavour in shop_stock:
    print("Yes, we do have it")
else:
    print("No, we ran out of stock")
```

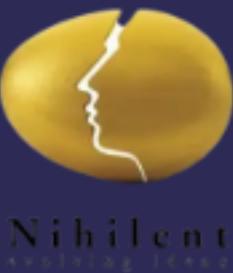


```
# Applying the ternary operator for compactness
shop_stock = "vanilla, lime, chocolate"
fav_flavour = input("Please tell me your flavour: ")

result = "Yes, we do have it" if fav_flavour in shop_stock else "No, we ran out of stock"
print(result)
```

Operators in Python

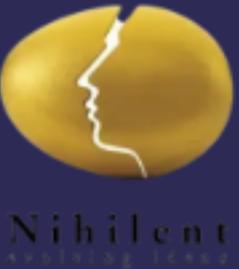
- **Unary Operators:** Operate on a single operand (e.g., `not`, `~` for bitwise NOT).
- **Binary Operators:** Perform operations on two operands (e.g., arithmetic, comparison, logical).
- **Ternary Operator:** A concise way to perform an if-else in a single line.



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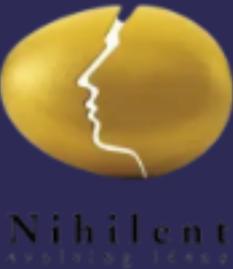
Summary and Conclusion

- Python offers various ways to handle conditional logic, from basic `if` statements to using operators for more concise code.
- The membership operator (`in`) simplifies checking for the presence of a value in a collection.
- The ternary operator provides a compact way to write simple conditional assignments.



Secret Code Extractor

Demonstrating string manipulation techniques in Python to uncover hidden messages.

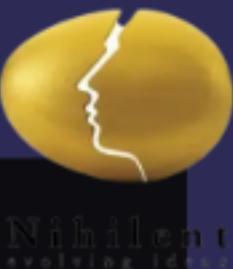


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```
# Extracting the secret code after the 🔑 emoji
message = "    🚨🔍💻🔑 secret_code 🤝 "
code = "SECRET_CODE 🤝"

key_idx = message.find('🔑')
secret_msg = message[(key_idx + 1):]
output = secret_msg.upper()
print(output)

if (output == code):
    print("You are an hacker 🎉")
else:
    print("Try again")
```



```
# Corrected approach to handle when no 🔑 is present
message = "    🚨🔍💻 secret_code ✌️"
code = "SECRET_CODE ✌️"

key_idx = message.find('🔑')

if key_idx != -1:
    secret_msg = message[(key_idx + 1):]
    output = secret_msg.upper()
    print(output)

    if (output == code):
        print("You are an hacker 💻")
    else:
        print("Try again")
else:
    print('No, secret is present')
```

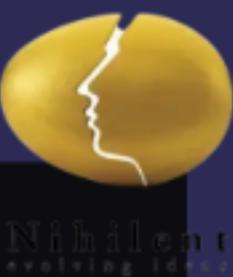


```
# Adjusted for correct conditional check in Task 2
message = "      🚨🔍🔑 ****secret_code👉 ((((" 
code = "SECRET_CODE👉"
key_idx = message.find('🔑')

if key_idx != -1:
    secret_msg = message[(key_idx + 1):]
    output = secret_msg.upper().strip(')').strip('*')
    print(output)

    if (output == code):
        print("You are an hacker 💻")
    else:
        print("Try again")
else:
    print("No secret is present")
```

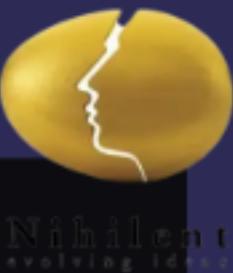
Task 3: Cleaning the Secret Code



```
# Updated to reflect the corrected Logical flow from Task 2
message = "      🚨🔍🔑 ****secret_code ✌ ((((" 
code = "SECRET_CODE ✌ "
key_idx = message.find('🔑')
if key_idx != -1:
    output = message[(key_idx + 1):].upper().strip(')').strip('*')
print(output)

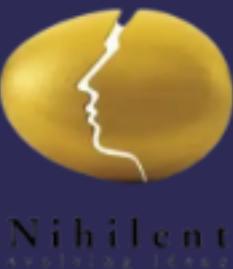
if (output == code):
    print("You are an hacker 🎉")
else:
    print("Try again")
else:
```

Dot Chaining for Efficiency



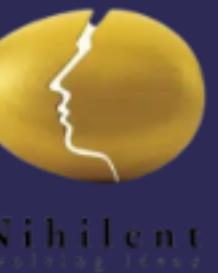
String Manipulation in Python

- **Finding Substrings:** Using `.find()` to locate specific characters or sequences.
- **Case Conversion:** `.upper()` to convert to uppercase for matching or processing.
- **Trimming Characters:** Using `.strip()` to remove unwanted characters from the start and end of strings.
- **Dot Chaining:** Combining multiple string operations in a single expression for efficiency.



Advanced List Manipulation Techniques in Python

Deep dive into Python lists: exploring their mutable nature, operation categories, and best practices for efficient data handling.

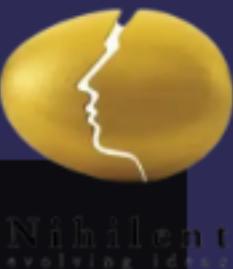


Understanding List Mutability

```
# Lists in Python are mutable, allowing for dynamic modifications
marks = [98, 75, 40, 80, 90]
print("Original list:", marks)

# Removing elements demonstrates mutability
marks.pop()
print("List after .pop():", marks)

# Modifying an element by index
marks[2] = 85 # Changing 40 to 85
print("List after modifying an element:", marks)
```

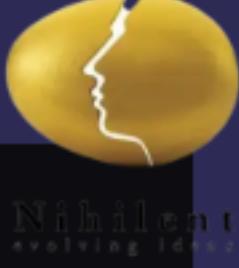


Adding and Removing Elements

```
# Adding and removing elements
subjects = ['Maths', 'Science']
subjects.append('English') # Adding an element
print("After append:", subjects)

subjects.remove('Science') # Removing a specific element
print("After remove:", subjects)
```

Using .append() and .remove()

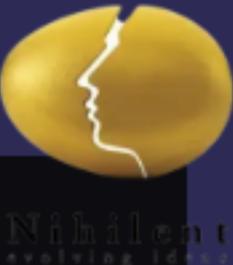


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CONSULTING

Adding and Removing Elements

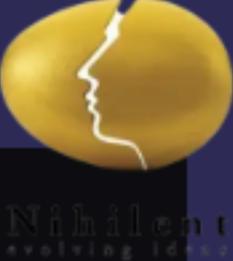
```
# Inserting at a specific index and popping
marks = [98, 75, 85]
marks.insert(1, 88) # Insert 88 at index 1
print("After insert:", marks)

popped_mark = marks.pop(2) # Pop element at index 2
print("After pop:", marks, "| Popped element:", popped_mark)
```



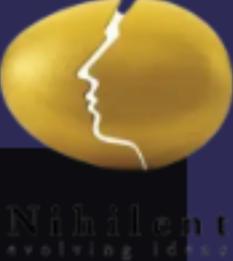
Combining, Duplicating, and Slicing Lists

```
# Combining two Lists
list1 = [1, 2, 3]
list2 = [4, 5, 6]
combined_list = list1 + list2
print("Combined list:", combined_list)
```



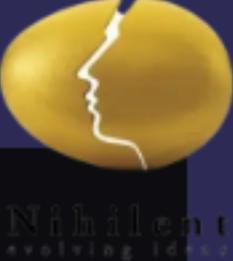
Combining, Duplicating, and Slicing Lists

```
# Duplicating lists
duplicated_list = ['a', 'b'] * 3
print("Duplicated list:", duplicated_list)
```



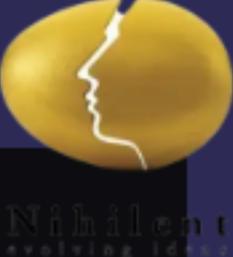
Combining, Duplicating, and Slicing Lists

```
# Slicing for copying and subsetting
marks = [98, 75, 85, 90, 95]
subset_marks = marks[1:4] # Get subset from index 1 to 3
print("Subset of marks:", subset_marks)
```



Copying Lists and Understanding Memory Management

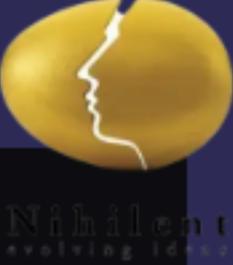
```
# Creating a shallow copy of a list
original_list = [1, 2, 3]
shallow_copy = original_list[:]
shallow_copy.append(4)
print("Original list:", original_list)
print("Shallow copy with new element:", shallow_copy)
```



Copying Lists and Understanding Memory Management

```
# Demonstrating different memory addresses for copied lists
print("Memory address of original list:", id(original_list))
print("Memory address of shallow copy:", id(shallow_copy))
```

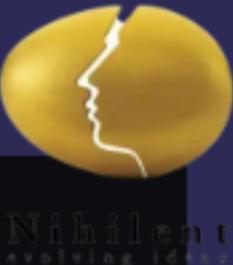
Comparing Memory Addresses



Sorting and Joining Lists

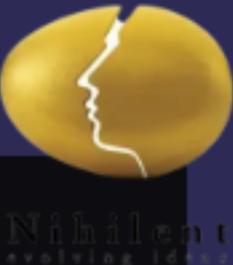
```
# Sorting lists in ascending and descending order
numbers = [3, 1, 4, 1, 5, 9, 2, 6]
numbers.sort() # Sorts in place
print("Sorted in ascending:", numbers)

numbers.sort(reverse=True)
print("Sorted in descending:", numbers)
```



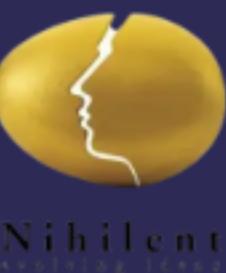
Sorting and Joining Lists

```
# Joining elements of a List into a string
subjects = ['Maths', 'Science', 'English']
subjects_str = ", ".join(subjects)
print("Subjects as a string:", subjects_str)
```



Mastering the `.split()` Method in Python

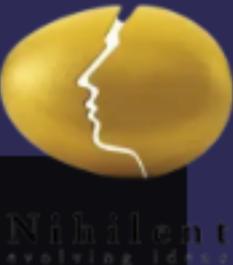
Understanding how to divide strings into lists using `.split()` for effective data manipulation and processing.



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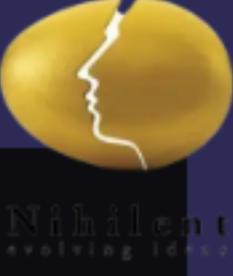
Exploring .split(): From Basics to Advanced Usage

```
# Splitting a string into a list by spaces (default behavior)
sentence = "Learning Python is fun"
words = sentence.split()
print(words)
# Output: ['Learning', 'Python', 'is', 'fun']
# Demonstrates basic string splitting into a list of words.
```



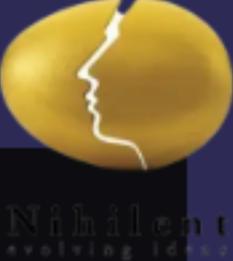
Exploring .split(): From Basics to Advanced Usage

```
# Using a custom separator to split a string
data = "name:John;age:30;city>New York"
details = data.split(';')
print(details)
# Output: ['name:John', 'age:30', 'city>New York']
# Illustrates splitting a string using a custom separator ';'.
```



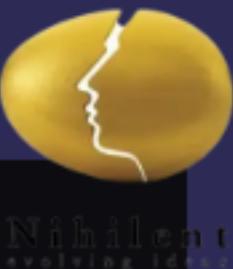
Exploring .split(): From Basics to Advanced Usage

```
# Limiting the number of splits
limited_split = "apple,banana,cherry,dragonfruit".split(',', 2)
print(limited_split)
# Output: ['apple', 'banana', 'cherry,dragonfruit']
# Shows how to limit the number of splits in the result.
```



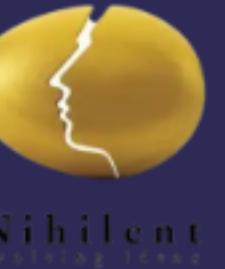
Exploring `.split()`: From Basics to Advanced Usage

```
# Splitting a multi-line string
multi_line_text = """Python
JavaScript
HTML
CSS"""
languages = multi_line_text.split('\n')
print(languages)
# Output: ['Python', 'JavaScript', 'HTML', 'CSS']
# Demonstrates splitting a string by new line characters.
```



Correcting a Scrambled Sentence Using Python

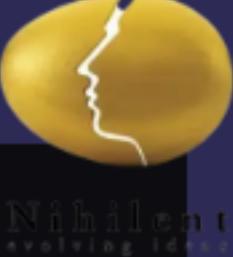
This slide demonstrates a step-by-step approach to unscrambling a sentence, leveraging Python's list capabilities.



From Scramble to Coherence: A Step-by-Step Correction

```
# Beginning with a scrambled message
scrambled_message = "world the save to time no is there"
# Objective: Reorder the words to form a coherent sentence.
```

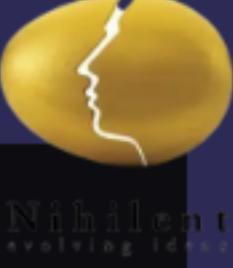
Step 1: The Scrambled Message



From Scramble to Coherence: A Step-by-Step Correction

```
# Splitting the scrambled sentence into a list of words
scrambled_message = "world the save to time no is there"
scrambled_list = scrambled_message.split(' ')
# Now we have a list of words to work with.
```

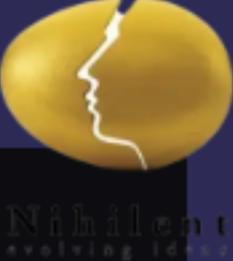
Step 2: Splitting into Words



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From Scramble to Coherence: A Step-by-Step Correction

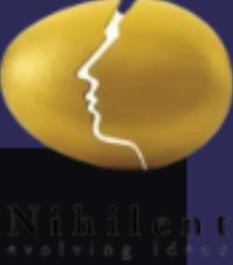
```
# Reversing the List to correct the order of words
scrambled_message = "world the save to time no is there"
scrambled_list = scrambled_message.split(' ')
reversed_list = scrambled_list[::-1]
# The words are now in the correct order to form a meaningful sentence.
```



From Scramble to Coherence: A Step-by-Step Correction

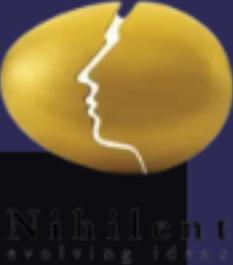
```
# Joining the reversed list back into a sentence
scrambled_message = "world the save to time no is there"
scrambled_list = scrambled_message.split(' ')
reversed_list = scrambled_list[::-1]
corrected_message = " ".join(reversed_list)
# We've reconstructed the sentence into its intended form.
```

Step 4: Forming the Corrected Sentence



From Scramble to Coherence: A Step-by-Step Correction

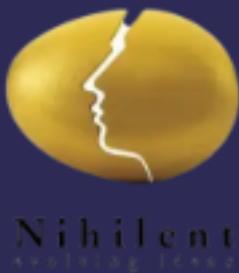
```
# Combining all steps to correct the scrambled message
scrambled_message = "world the save to time no is there"
scrambled_list = scrambled_message.split(' ')
reversed_list = scrambled_list[::-1]
corrected_message = " ".join(reversed_list)
print(corrected_message) # Output: there is no time to save the world
```



Mastering Loops in Python

An in-depth exploration of loop constructs in Python:

- `while` loops for repeated execution based on a condition
- `for` loops for iterating over sequences.



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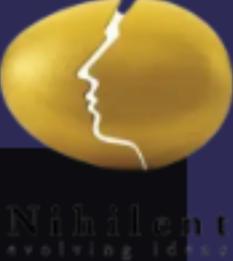
Understanding While Loops

Demonstrating a simple while Loop

```
i = 0
```

```
while i < 3:  
    print(i)  
    i = i + 1
```

This Loop prints numbers 0 to 2, demonstrating basic Loop control with a counter.

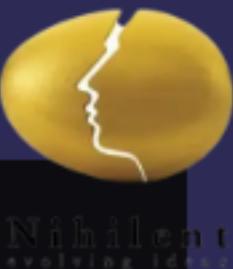


Understanding While Loops

```
# Creating a pattern with input-controlled repetition
no_of_rows = int(input("How many rows you would like? "))
i = 1

while i <= no_of_rows:
    print("😊" * i)
    i += 1
```

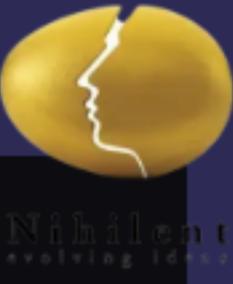
This example takes user input to determine the number of rows for the pattern.



Leveraging For Loops

```
# Using range() with for Loops for controlled iteration
for curr in range(3):
    print(curr)
```

Demonstrates iterating over a sequence of numbers generated by range().



Leveraging For Loops

```
# Another approach to generating patterns, now with for Loops
no_of_rows = int(input("How many rows you would like? "))
```

```
for i in range(1, no_of_rows + 1):
    print("😊" * i)
```

Similar to the while Loop example, but showcasing the for Loop's iteration capabilities.

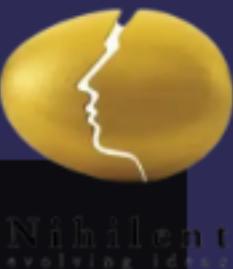


Manipulating Lists with Loops

```
# Modifying List elements in place
player_stats = [10, 30, 60]
for i in range(len(player_stats)):
    player_stats[i] *= 2

print(player_stats)

# Showcases how to iterate over a list by index to modify each element.
```



Manipulating Lists with Loops

```
# Modifying List elements in place
powered_up_stats = player_stats.copy()
for i in range(len(player_stats)):
    powered_up_stats[i] *= 2
print(powered_up_stats, player_stats)

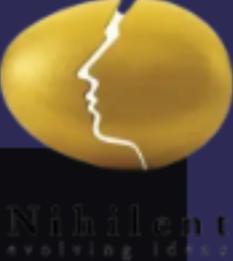
# Creating a copy and not modifying the original
```



Manipulating Lists with Loops

```
# Using List comprehension for efficient List manipulation
powered_up_stats = [stat * 2 for stat in player_stats]
print(powered_up_stats, player_stats)
```

Demonstrates doubling the values in player_stats using List comprehension.

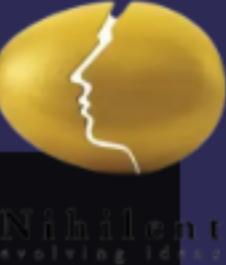


Advanced List Comprehension

```
# Calculating the Length of each string in a list
avengers = ["Hulk", "Iron man", "Black widow", "Captain america", "Spider man", "Thor"]
names_char_count = [len(avenger) for avenger in avengers]

print(names_char_count)

# This example showcases using list comprehension to calculate the character count of each string in a list.
```

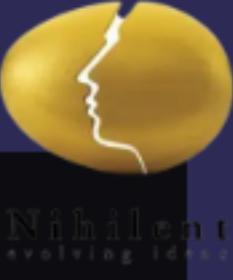


Advanced List Comprehension

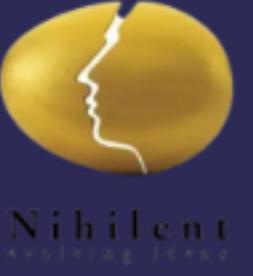
```
# Filtering elements based on their characteristics
long_names = [avenger for avenger in avengers if len(avenger) > 10]

print(long_names)

# Filters the avengers list to include only names Longer than 10 characters.
```



That's all folks 



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