

Task 1:

Prompt: write a python program to reverse a string without functions

Code: `def reverse_string(s):`

`reversed_str = ""`

`for i in range(len(s) - 1, -1, -1):`

`reversed_str += s[i]`

`return reversed_str`

`input_string = input("Enter a string: ")`

`reversed_string = reverse_string(input_string)`

`print("Reversed string:", reversed_string)`

output: Enter a string: nikhhil

Reversed string: lihhkin

Task 2:

Prompt: #simplify this string reversal code and improve readability and efficiency

Code:

`input_string = input("Enter a string: ")`

`reversed_string = input_string[::-1]`

`print("Reversed string:", reversed_string)`

output: Enter a string: phani

Reversed string: inahp

Task 3:

Prompt: Give string reversal code with using functions

Code:

`def reverse_string(s: str) -> str:`

`return s[::-1]`

```

if __name__ == "__main__":
    input_string = input("Enter a string: ")
    reversed_string = reverse_string(input_string)
    print("Reversed string:", reversed_string)

```

Task 4:

Prompt: Analyse the code with function and without function and give a comparison table

```

#Analyse the code with function and without function and give a comparison table
# | Aspect | Without Functions | With Functions |
# |-----|-----|-----|
# | Code Clarity | Less clear, harder to follow logic | More organized, easier to understand |
# | Reusability | Low, code cannot be reused easily | High, functions
#   can be reused in different contexts |
# | Debugging Ease | Difficult to isolate issues | Easier to debug specific functions |
# | Suitability for Large-Scale Applications | Not suitable, hard to maintain | Highly suitable
# , modular structure aids maintenance |

```

Task 5:

Prompt: Give different approaches to reverse a string like a loop based and built in or slicing based.

Code:

```

def reverse_string_loop(s: str) -> str:
    reversed_str = ""
    for char in s:
        reversed_str = char + reversed_str
    return reversed_str

# Slicing-based approach
def reverse_string_slicing(s: str) -> str:
    return s[::-1]

if __name__ == "__main__":
    input_string = input("Enter a string: ")
    print("Reversed using loop:", reverse_string_loop(input_string))
    print("Reversed using slicing:", reverse_string_slicing(input_string))

```

# Aspect	Loop-based Approach	Slicing-based Approach
# Execution flow	Iterates through each character and builds the reversed string step-by-step.	Uses Python's built-in slicing mechanism to reverse the string in one operation
# Time complexity	$O(n^2)$ due to string concatenation in a loop	$O(n)$ as slicing is optimized
# Performance for large inputs	Slower for large strings due to repeated concatenation	Faster for large strings
# When each approach is appropriate	Useful when you want to understand the underlying logic or when implementing custom reversal logic without built-ins.	Preferred in production code where performance matters and readability is important