Here's a clear explanation of each section of your code related to **strings, slicing, and formatting in Python**:

**✅ 1. Indexing and Slicing**

python

CopyEdit

pen = "Red Pen"

first\_char = pen[0]

* pen[0] gives the first character → 'R'.

python

CopyEdit

slice\_pen = pen[0:4]

* Slices from index 0 up to, but not including, index 4 → 'Red ' (includes space).

python

CopyEdit

pen[-1]

* -1 gets the last character → 'n'.

**✅ 2. Slicing on a String of Numbers**

python

CopyEdit

num\_list = "0123456789"

num\_list[:] → '0123456789' (whole string)

num\_list[0:5] → '01234'

num\_list[4:] → '456789'

num\_list[:8] → '01234567'

num\_list[0:7:2] → '0246' (start=0, end=7, step=2)

**✅ 3. String Methods**

python

CopyEdit

pen.lower() → 'red pen'

pen.upper() → 'RED PEN'

pen.strip() → removes leading/trailing spaces

pen.replace("Red","Black") → changes word "Red" to "Black"

**✅ 4. Splitting Strings**

python

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pen = "Red , Balck , Green , Blue"

pen.split() → splits on \*\*whitespace\*\*

pen.split(", ") → splits on comma and space

**✅ 5. Searching and Counting**

python

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pen.find("pen") → returns index where "pen" starts (first match)

pen.count("pen") → counts occurrences of "pen"

**✅ 6. String Formatting**

python

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order = "I need {} packets of {} pen"

print(order.format(quantity, pen\_type))

* .format() fills in {} placeholders: → "I need 4 packets of Red pen"

**✅ 7. Joining List of Strings**

python

CopyEdit

pen\_variety = ["Red", "Black", "Blue", "Yellow"]

"".join(pen\_variety) → 'RedBlackBlueYellow'

" ".join(pen\_variety) → 'Red Black Blue Yellow'

" -- ".join(pen\_variety) → adds separator

**✅ 8. Length and Loop**

python

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len(pen) → returns length of string, e.g. 7

for letter in pen: → loops over each character

**✅ 9. Quotes and Escape Sequences**

python

CopyEdit

pen = "He said, \"Red pen is smooth\""

# Uses `\"` to include quotes inside string

pen = "Red \nPen"

# `\n` creates a new line

pen = r"Red\nPen"

# `r` before string makes it a \*\*raw string\*\* (disables escape sequences)

pen = "c:\\user\\pwd"

# Backslashes need escaping (`\\`)

**✅ 10. Membership Testing**

python

CopyEdit

"Red" in pen → checks if "Red" is a substring → True

"Reed" in pen → False

**✅ Common Mistake Handled**

python

CopyEdit

for letter in pen:

print(letter)

* You got an IndentationError because the print() was not indented properly under the for loop. Fixed by indenting with spaces or tab.