PYTHON PROGRAMMING
Assignment # 01

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Question 01

Part 01

Write a program to get a string from user and then reverse the string.

Method 01:

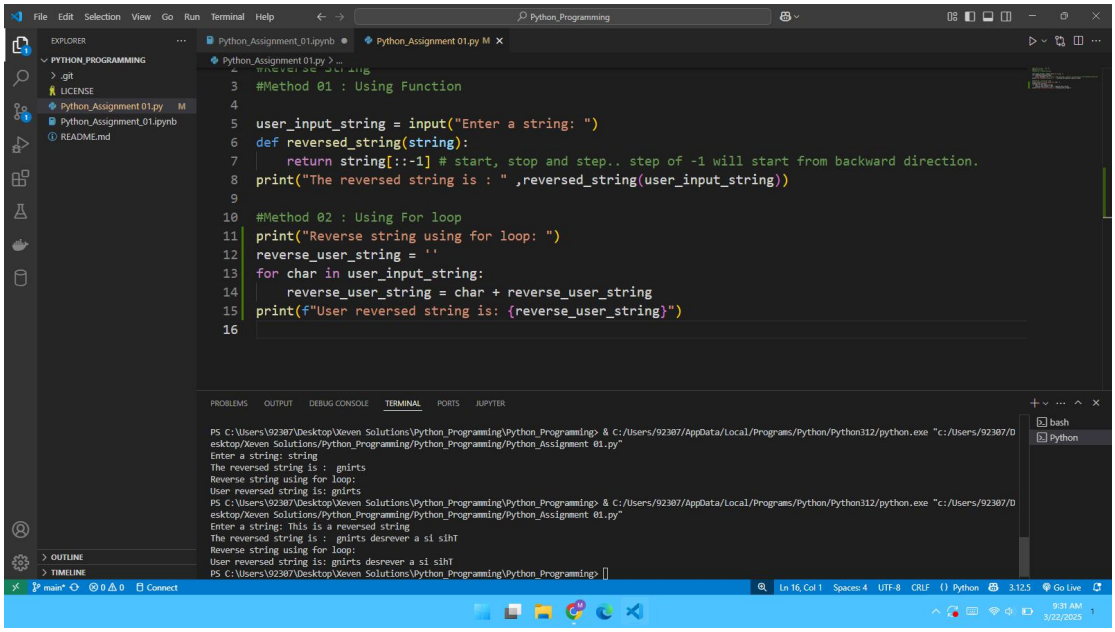
I have used two different methods in it. The first one is by defining a function to get the string from user and then reverse that string. This function use slicing in which 3 values start, stop, step are used. As we want to reverse the string so we will move backward , for this -1 will be used as a step that tells about the direction to start from the end.

```
user_input_string = input("Enter a string: ")
def reversed_string(string):
    return string[::-1] # start, stop and step.. step
of -1 will start from backward direction.
print("The reversed string is :
" ,reversed_string(user_input_string))

#Method 02 : Using For loop
print("Reverse string using for loop: ")
reverse_user_string = ''
for char in user_input_string:
    reverse_user_string = char + reverse_user_string
print(f"User reversed string is:
{reverse_user_string}")
```

Method 02:

The second method is by using for loop in which I have created an empty variable and then store the each character of the string in that variable.



Part 02

Count the number of vowels in the string.

Method 01:

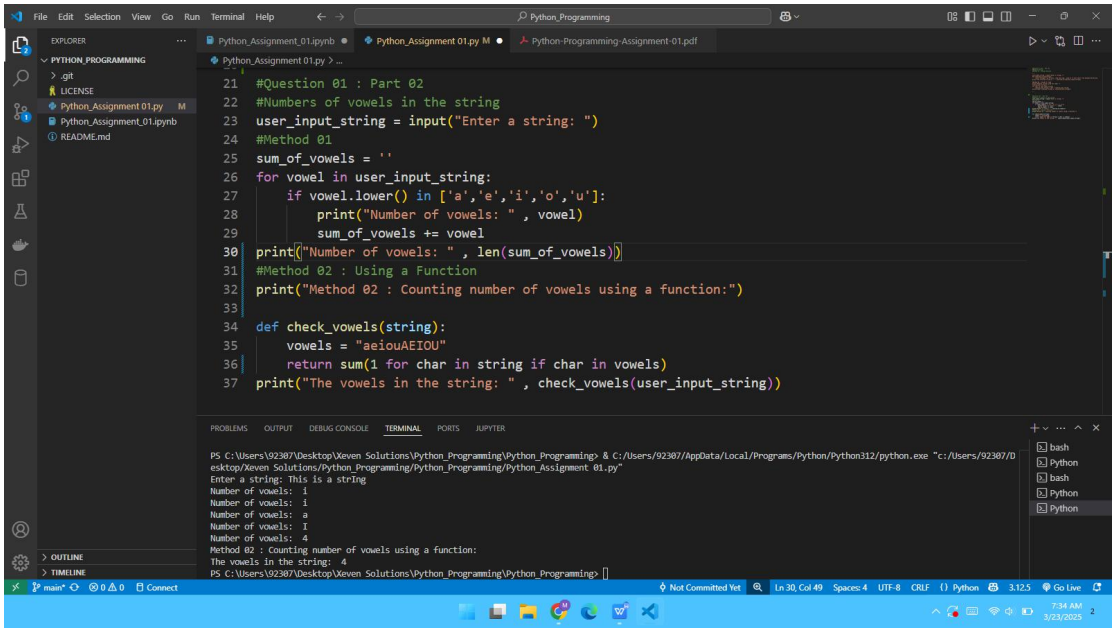
I have used two different methods for this part as well. The first one is using a for loop in which each character of string is stored in a variable named “vowel” and then a function named “lower()” is used to make the charters in lowercase to check that either these characters are present in list `['a','e','i','o','u']` or not. If the character is in vowel list then the character will be added to the variable named “sum_of_vowels” and will be displayed.

```
#Question 01 : Part 02
#Numbers of vowels in the string
user_input_string = input("Enter a string: ")
#Method 01
sum_of_vowels = ''
for vowel in user_input_string:
    if vowel.lower() in ['a','e','i','o','u']:
        print("Number of vowels: " , vowel)
        sum_of_vowels += vowel
print("Number of vowels: " , len(sum_of_vowels))
#Method 02 : Using a Function
print("Method 02 : Counting number of vowels using a function:")
```

```
def check_vowels(string):
    vowels = "aeiouAEIOU"
    return sum(1 for char in string if char in vowels)
print("The vowels in the string: " ,
check_vowels(user_input_string))
```

Method 02:

The second method is using a function that take a “string” as a parameter and check that the string character is in vowel variable and will add 1 for each character.



Question 02

Problem: Create a Python program that:

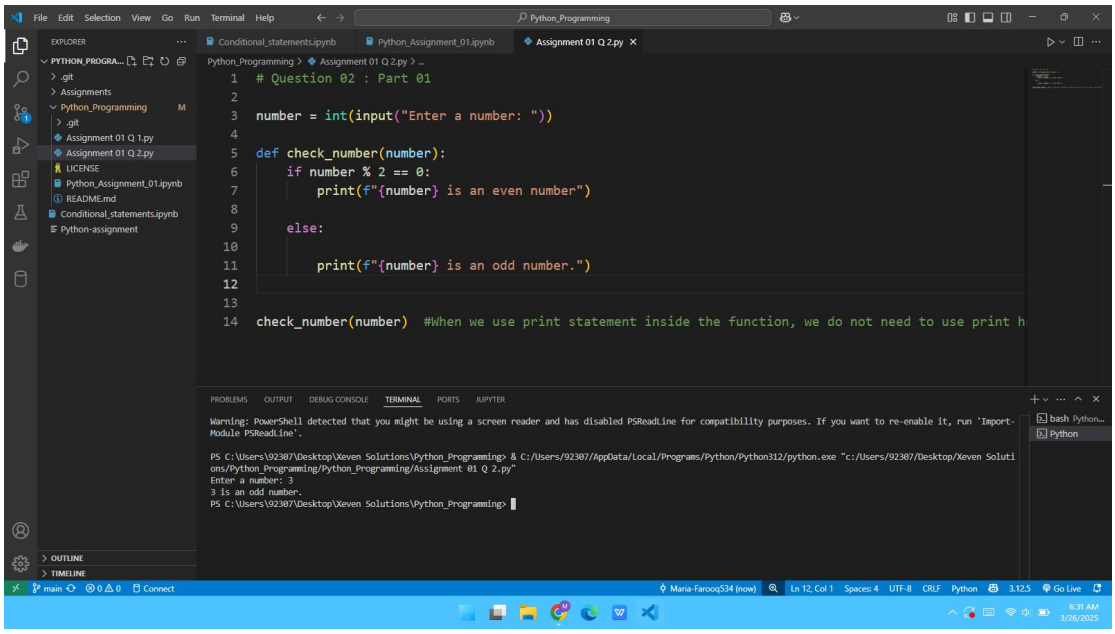
- Takes an input number from the user.
- Checks whether the number is even or odd.
- Prints the result.

```python
# Question 02

number = int(input("Enter a number: "))
def check_number(number):
    if number % 2 == 0:
        print(f"{number} is an even number")

    else:

        print(f"{number} is an odd number.")
check_number(number)  #When we use print statement inside the function, we do not need to use print here again.
```



Question 3:
Virtual Environment Application Problem:
Create a Python program that:

1. **Takes a list of integers as input.**
2. **Creates a new virtual environment called sortenv.**
3. **Installs a package (such as numpy) in the virtual environment.**
4. **Sorts the list using a numpy method (numpy.sort()).**
5. **Prints the sorted list.**

- **Takes a list of integers as input.**

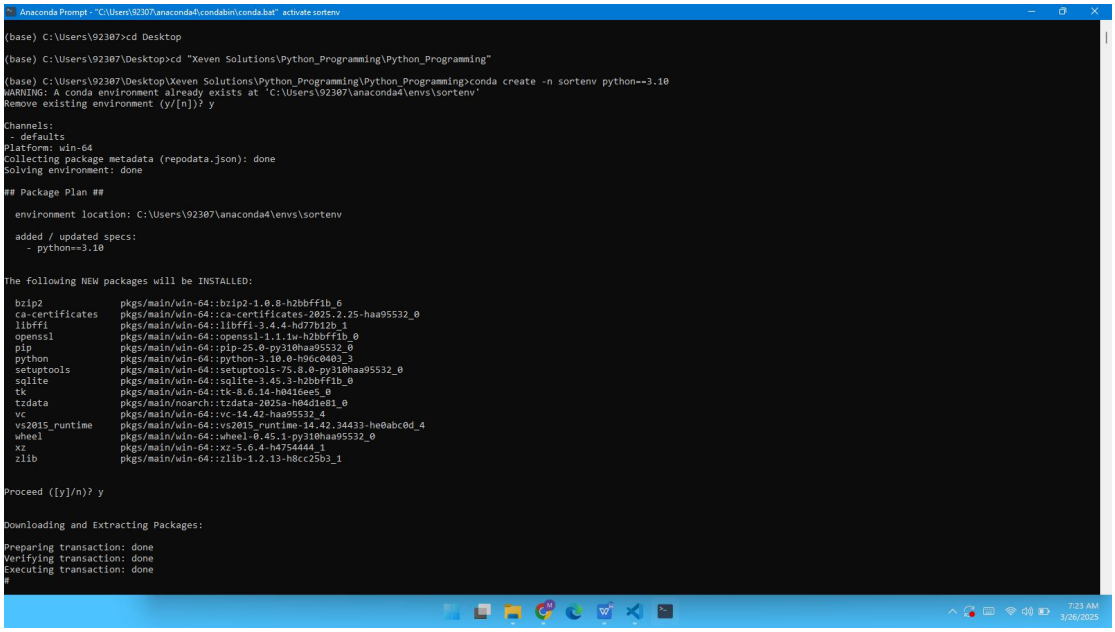
- **2. Creates a new virtual environment called sortenv.**

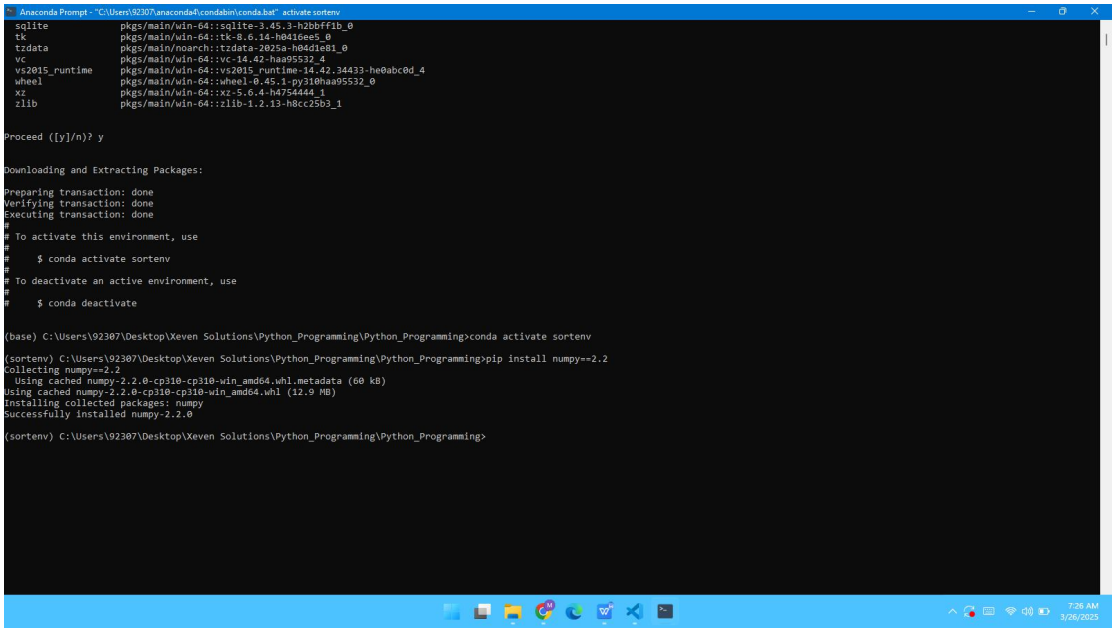
  conda create -n sortenv python==3.10
  conda activate sortenv

- **3. Installs a package (such as numpy) in the virtual environment.**

  pip install numpy==2.2

- **4. Sorts the list using a numpy method (numpy.sort()).**
- **5. Prints the sorted list.**





Using Anaconda:

```
#Using Anaconda
import numpy as np

#Virtual environment setup
def setup_virtual_environment():
    print("Create virtual environment using anaconda
by running this command: ")
    print("conda create -n sortenv pythoun==3.12 ")
    print("Activate Environment: ")
    print("conda activate sortenv")
    print("Install Python library: Numpy")
    print("!pip install numpy")
```

```
#Sorting array
def sort_list(arr):
    return np.sort(arr)
```

```
#Taking input from user
try:
    user_input = input("Enter a list of integers
seperated by space: ")
```

```
    num_list = list(map(int, user_input.split()))
    print(setup_virtual_environment())
    print("Sorted list: " , sort_list(num_list))
except ValueError:
    print("Invalid Input!")
```

Method 02:

```
def sort_list(arr):
    return np.sort(arr)
# Simulating virtual environment setup
def setup_virtual_env():
    print('Step 1: Create a virtual environment
using:')
    print(" Python -m venv sortenv")
    print('Step 2: Activate the virtual envorinment')
    print(' Windows: sortenv\\Scripts\\activate')
    print(' macOS/Linux: source
sortenv/bin/activate')
    print('Step 3: install NumPy in the virtual
environment')
    print(' pip install numpy')
    print('Step 4: Now, sorting the list using
NumPy...')

Taking user input as a list of integers
try:
    user_input = input('Enter a list of numbers
separated by spaces: ')
    num_list = list(map(int,user_input.split()))

    setup_virtual_env()

    print('Sorted list: ',sort_list(num_list))
```

```
except ValueError:
    print('Invalid input! Please enter a list of
integers.')
```