

1.# Write a Python function that checks whether a given number is a palindrome.

Code:

```
def is_palindrome(number):

    if number < 0:
        return False

    temp=number
    rev=0

    while temp != 0:
        rev = rev * 10 + temp % 10
        temp //= 10

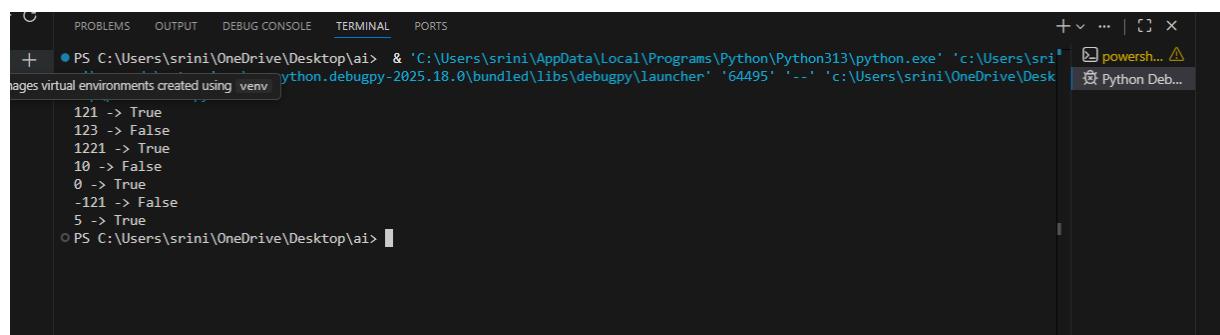
    return rev == number

numbers = [121, 123, 1221, 10, 0, -121, 5]

for n in numbers:
    print(f"{n} -> {is_palindrome(n)}")
```

Step-by-Step Explanation

1. If the number is **negative**, return False.
2. Store the original number in temp.
3. Reverse the number using a while loop.
4. Compare the reversed number with the original.
5. If both are equal, it is a **palindrome**; otherwise, it is **not**.



The screenshot shows a terminal window with the following output:

```
121 -> True
123 -> False
1221 -> True
10 -> False
0 -> True
-121 -> False
5 -> True
```

2. #Write a Python function to compute the factorial of a given number.

Code:

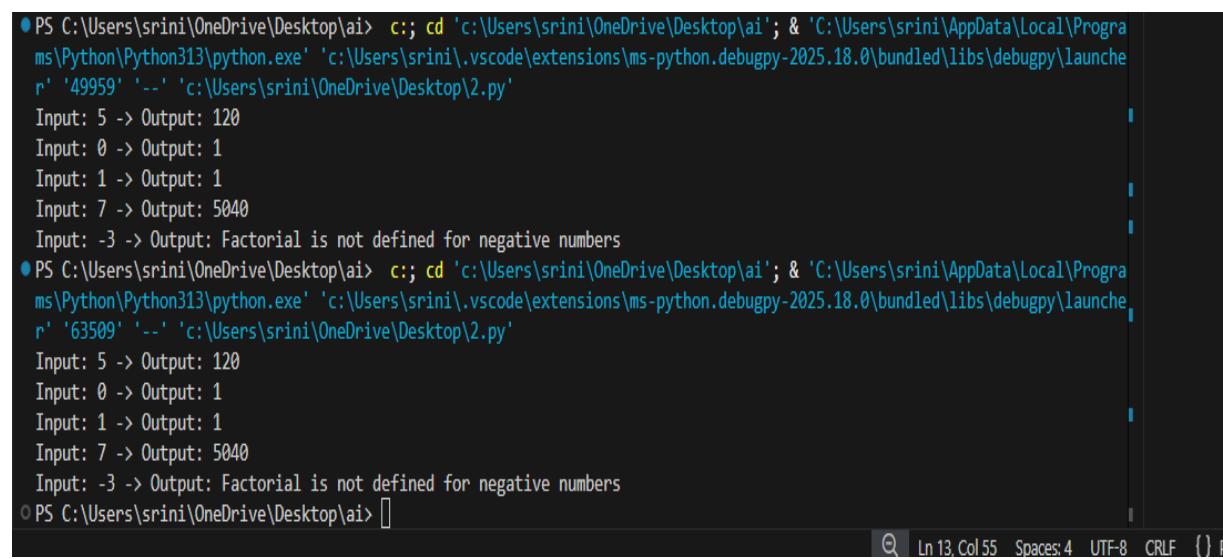
```
def factorial(n):
    if n < 0:
        return "Factorial is not defined for negative numbers"
    if n==0 or n==1:
        return 1
    result = 1
    for i in range(2, n + 1):
        result *= i
    return result

test_values = [5, 0, 1, 7, -3]

for val in test_values:
    print(f"Input: {val} -> Output: {factorial(val)}")
```

Step-by-Step Explanation (Factorial Function)

1. If the number is **negative**, return an error message.
2. If the number is **0 or 1**, return 1 (base case).
3. Initialize result = 1.
4. Use a for loop from 2 to n and multiply each value with result.
5. Return the final factorial value.



The screenshot shows a terminal window with the following output:

```
PS C:\Users\srini\OneDrive\Desktop\ai> c;; cd 'c:\Users\srini\OneDrive\Desktop\ai'; & 'C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\srini\.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launcher' '49959' '--' 'c:\Users\srini\OneDrive\Desktop\2.py'
Input: 5 -> Output: 120
Input: 0 -> Output: 1
Input: 1 -> Output: 1
Input: 7 -> Output: 5040
Input: -3 -> Output: Factorial is not defined for negative numbers
PS C:\Users\srini\OneDrive\Desktop\ai> c;; cd 'c:\Users\srini\OneDrive\Desktop\ai'; & 'C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\srini\.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launcher' '63509' '--' 'c:\Users\srini\OneDrive\Desktop\2.py'
Input: 5 -> Output: 120
Input: 0 -> Output: 1
Input: 1 -> Output: 1
Input: 7 -> Output: 5040
Input: -3 -> Output: Factorial is not defined for negative numbers
PS C:\Users\srini\OneDrive\Desktop\ai> 
```

3.#Write a Python function to check whether a given number is an Armstrong number.

Code:

```
def is_armstrong(number):

    if number < 0:
        return "Invalid input"

    digits = str(number)
    power = len(digits)
    total = 0

    for d in digits:
        total += int(d) ** power

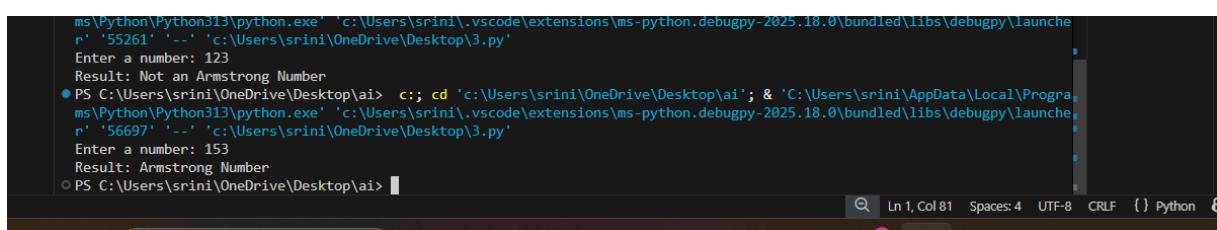
    if total == number:
        return "Armstrong Number"
    else:
        return "Not an Armstrong Number"

n = int(input("Enter a number: "))

print("Result:", is_armstrong(n))
```

Step-by-Step Explanation (Armstrong Number)

1. If the number is **negative**, return "Invalid input".
2. Convert the number to a **string** to get each digit easily.
3. Count the **number of digits**.
4. Raise each digit to the power of the total digits and **add them**.
5. Compare the sum with the original number.
6. If both are equal, it is an **Armstrong Number**; otherwise, it is **not**.



The screenshot shows a terminal window with the following text:

```
ms\Python\Python313\python.exe 'c:\Users\smini.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launche
r' '55261' '--' 'c:\Users\smini\OneDrive\Desktop\3.py'
Enter a number: 123
Result: Not an Armstrong Number
PS C:\Users\smini\OneDrive\Desktop\ai> c:; cd 'c:\Users\smini\OneDrive\Desktop\ai'; & 'C:\Users\smini\AppData\Local\Program
ms\Python\Python313\python.exe' 'c:\Users\smini.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launche
r' '56697' '--' 'c:\Users\smini\OneDrive\Desktop\3.py'
Enter a number: 153
Result: Armstrong Number
PS C:\Users\smini\OneDrive\Desktop\ai>
```

5. #Generate a Python function that checks whether a given number is a perfect number. The function should return True if the number is perfect, otherwise return False.

```
def is_perfect_number(n):

    if n < 1:
        return False

    total=1

    for i in range(2, int(n**0.5) + 1):
        if n % i == 0:
            total += i

            if i != n // i:
                total += n // i

    return total == n

num=int(input("Enter a number: "))

if is_perfect_number(num):

    print(f"{num} is a perfect number.")

else:

    print(f"{num} is not a perfect number.")
```

Step-by-Step Explanation (Perfect Number)

1. If the number is **less than 1**, return False.
2. Initialize total = 1 (since 1 is a proper divisor).
3. Loop from 2 to \sqrt{n} to find divisors.
4. If i divides n, add both i and n/i to total.
5. Compare the sum of proper divisors with the original number.
6. If both are equal, it is a **perfect number**; otherwise, it is **not**.

```
PS C:\Users\srini\OneDrive\Desktop\ai> & 'C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\srini\.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launcher' '59346' '--' 'c:\Users\srini\OneDrive\Desktop\5.py'
Enter a number: 6
6 is a perfect number.

PS C:\Users\srini\OneDrive\Desktop\ai> <: cd 'c:\Users\srini\OneDrive\Desktop\ai'; & 'C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\srini\.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launcher' '64198' '--' 'c:\Users\srini\OneDrive\Desktop\5.py'
Enter a number: 10
10 is not a perfect number.

PS C:\Users\srini\OneDrive\Desktop\ai> <: cd 'c:\Users\srini\OneDrive\Desktop\ai'; & 'C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe' 'c:\Users\srini\.vscode\extensions\ms-python.debugpy-2025.18.0\bundled\libs\debugpy\launcher' '64396' '--' 'c:\Users\srini\OneDrive\Desktop\5.py'
Enter a number: 6
6 is a perfect number.

PS C:\Users\srini\OneDrive\Desktop\ai>
```

6. #Write a Python program that determines whether a given number is Even or Odd and includes proper input validation.

```
def even_or_odd():
    n=input("Enter a number: ")
    try:
        n=int(n)
        if n % 2 == 0:
            print("Even")
        else:
            print("Odd")
    except ValueError:
        print("Invalid input. Please enter an integer.")
even_or_odd()
```

Step-by-Step Explanation (Even or Odd with Validation)

1. Take input from the user.
2. Try to convert the input into an integer.
3. If conversion fails, display an **invalid input** message.
4. If the number is divisible by 2, print **Even**.
5. Otherwise, print **Odd**.

```
File Edit Selection View Go Run Terminal Help ↻ → 🔍 ai
C:\Users\srini\OneDrive\Desktop> gpy ...
#Write a Python program that determines whether a given number is Even or Odd and includes proper input validation.
1
2
3 def even_or_odd():
4     n=input("Enter a number: ")
5     try:
6         n=int(n)
7         if n % 2 == 0:
8             print("Even")
9         else:
10            print("Odd")
11     except ValueError:
12         print("Invalid input. Please enter an integer.")
13 even_or_odd()

18.0\bundle\libs\debug\launcher" 58277" --- "c:\Users\srini\OneDrive\Desktop\6.py"
PS C:\Users\srini\OneDrive\Desktop> c; cd "c:\Users\srini\OneDrive\Desktop\6"; & "C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe" "c:\Users\srini\vscode\extensions\ms-python.debug-2025.0.1\bundle\libs\debug\launcher" 58303" --- "c:\Users\srini\OneDrive\Desktop\6.py"
Enter a number: 67
Odd
PS C:\Users\srini\OneDrive\Desktop> c; cd "c:\Users\srini\OneDrive\Desktop\6"; & "C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe" "c:\Users\srini\vscode\extensions\ms-python.debug-2025.0.1\bundle\libs\debug\launcher" 58326" --- "c:\Users\srini\OneDrive\Desktop\6.py"
Enter a number: 78
PS C:\Users\srini\OneDrive\Desktop> c; cd "c:\Users\srini\OneDrive\Desktop\6"; & "C:\Users\srini\AppData\Local\Programs\Python\Python313\python.exe" "c:\Users\srini\vscode\extensions\ms-python.debug-2025.0.1\bundle\libs\debug\launcher" 58347" --- "c:\Users\srini\OneDrive\Desktop\6.py"
Enter a number: 6
Even
PS C:\Users\srini\OneDrive\Desktop>
```