SATYAJIT SWAIN ASSIGNMENT ANSWER

Problem Statement 1: Write a script in python or JavaScript to find the solution of the following problem
How many two or more digit numbers can you make such that digits on left are always smaller than the digits on the right in the number?

Source code:

```
def countNumbers(num):
    count = 0
    for i in range(10**(num-1), 10**num):
        digits = [int(d) for d in str(i)]
        if all(digits[j] < digits[j+1] for j in range(len(digits)-1)):
            count += 1
    return count
num= eval(input("Enter the digit: "))
count = countNumbers(num)
print("Number of valid {}-digit numbers: {}".format(num, count))
```

Output :

```
Enter the digit: 3
Number of valid 3-digit numbers: 84
```

Problem Statement 2: Write a script in python or JavaScript that would take two numbers and generate the additional steps in a json format.

Source Code:-

```
import json
def generate_addition_steps(num1, num2):
    num1_str = str(num1)[::-1]
    num2_str = str(num2)[::-1]
    carry = 0
    carry_str = ""
    steps = {}
    for i in range(max(len(num1_str), len(num2_str))):
        digit1 = int(num1_str[i]) if i < len(num1_str) else 0
        digit2 = int(num2_str[i]) if i < len(num2_str) else 0
        total = digit1 + digit2 + carry
        if total >= 10:
            carry = 1
            total -= 10
        else:
            carry = 0
        carry_str += str(carry)
        total_str = str(total).zfill(len(num1_str))
        step = {"carryString": carry_str[::-1], "sumString": total_str[::-1]}
        steps["step{}".format(i+1)] = step
    return json.dumps(steps, indent=4)
```

```
num1 = 1489
num2 = 714
steps = generate_addition_steps(num1, num2)
print(steps)
```

Output :-


```
{
   "step1": {
      "carryString": "1",
      "sumString": "3"
   },
   "step2": {
      "carryString": "11",
      "sumString": "03"
   },
   "step3": {
      "carryString": "111",
      "sumString": "203"
   },
   "step4": {
      "carryString": "111",
      "sumString": "2203"
   }
}
```