Problemm30

April 23, 2022

1 Problem 30

1.1 Digit 5th powers

Surprisingly there are only three numbers that can be written as the sum of fourth powers of their digits:

$1634 = 1^4 + 6^4 + 3^4 + 4^4$
$8208 = 8^4 + 2^4 + 0^4 + 8^4$
$9474 = 9^4 + 4^4 + 7^4 + 4^4$

As $1 = 1^4$ is not a sum it is not included.

The sum of these numbers is $1634 + 8208 + 9474 = 19316$.

Find the sum of all the numbers that can be written as the sum of fifth powers of their digits.

[ ]:
```
max_num = 5000000
start_num = 100
powers = 5
total_sum = 0

def intToList(num):
    return list(str(num))

for n in range(start_num, max_num):
    n_digits = intToList(n)
    current_sum = 0
    for d in n_digits:
        current_sum = current_sum + pow(int(d), powers)
    if current_sum == n:
        print(current_sum)
        total_sum = total_sum + current_sum

print("Total sum = ", total_sum)
```

```
4150
4151
54748
92727
93084
```

```
194979
Total sum =  443839
```