ALGORITHM DESIGN TERM PROJECT

1206 - SUM OF DIGITS OF THE SUM OF NUMBERS

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INTRODUCTION

Description

Time limit: 1.0 second Memory limit: 64 MB

> Let us denote the sum of digits of the number *N* by S(*N*). In this problem, we want you to determine, how often the following equality holds:

> > S(A + B) = S(A) + S(B)

PROBLEM

• Input

• The input contains a single integer K, $2 \le K \le 50$.

• Output

• You should output the number of pairs of *K*-digit numbers *A* and *B* to satisfy the above equality. Counting that number you should be aware of the following:

1.numbers A and B should not have leading zeroes;

2.while counting the total number of pairs, the order of numbers A and B matters, thus, for instance, (12, 26) and (26, 12) are different pairs that satisfy the conditions of the problem.

ans1 = 0
ans2 = 0
for i in range(1, 10) :
 for j in range(1, 10) :
 if i + j < 10 :
 ans1 += 1
for i in range(0, 10) :
 for j in range(0, 10) :
 if i + j < 10 :
 ans2 += 1</pre>

n = int(input())

for i in range (1, n) :
 ans1 *= ans2

print(ans1)

SOLUTION

PROOF

ID	Date	Author	Problem	Language	Judgement result	Test #	Execution time	Memory used
8657140	07:13:56 28 Nov 2019	Shiv Dechasakphan	<u>1206. Sum of Digits of the Sum of</u> <u>Numbers</u>	Python 3.6	Accepted		0.093	268 KB

PROOF

- S(A + B) = S(A) + S(B) is equal to that that for every pair of corresponding digits of A and B their sum is lower then 10 (1).
 For example:
 - 12 and 12 11 1 (10.2 12 (10 it ma
 - 12 and 13 :1+1<10;2+3<10 it means S(A + B) = S(A) + S(B)
 - 18 and 19: 8+9>10 it means S(A + B) = S(A) + S(B) is wrong here.

Then for every pair of digits from A and B you just count how many varints of pair suits (1) and multiply these quantities for all pairs.

REFERENCE

- <u>https://www.geeksforgeeks.org/program-for-sum-of-the-digits-of-a-given-number/</u>
- https://acm.timus.ru/forum/?space=1&num=1206

THANK YOU!