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**Register Number - RA1811030010023**

**Experiment No. 3 - Implementation of Constraint Satisfaction Problem**

**Cryptarithmetic Problem**

**Aim**

To implement the Constraint Satisfaction Problem based on the given constraints.

**Code**

**import** **itertools**

**def** getval(word, substitution):

*# Converts words in numbers*

s = 0

factor = 1

**for** letter **in** reversed(word):

s += factor \* substitution[letter]

factor \*= 10

**return** s

**def** solving(string):

*# split equation in left and right*

left, right = string.lower().replace(' ', '').split('=')

*# split words in left part*

left = left.split('+')

*# create list of used letters*

letters = set(right)

**for** word **in** left:

**for** letter **in** word:

letters.add(letter)

letters = list(letters)

*#creating diff permutations*

digits = range(10)

**for** perm **in** itertools.permutations(digits, len(letters)):

sol = dict(zip(letters, perm))

*# check if sum is equal and print*

**if** sum(getval(word, sol) **for** word **in** left) == getval(right, sol):

print(' + '.join(str(getval(word, sol)) **for** word **in** left) + " = **{}** **\n**(mapping: **{}**)**\n**".format(getval(right, sol), sol))

**if** \_\_name\_\_ == '\_\_main\_\_':

string = input()

solving(string)

TO + GO = OUT

21 + 81 = 102

(mapping: {'u': 0, 'o': 1, 't': 2, 'g': 8})

In [16]:

list(itertools.permutations(d, 6))

Out[16]:

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In [9]:

a='out'

a=set(a)

ab='a'

a

Out[9]:

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**Results**

The Constraint Satisfaction Problem was implemented successfully where the possible solutions were displayed based on user input.