

AI LAB EXP-3

CONSTRAINT SATISFACTION PROBLEM

Date: 28-01-2022

Name: Rahul Goel

Reg No: RA1911030010094

CODE:

```
import itertools

def get_value(word, substitution): s = 0
factor = 1
for letter in reversed(word):

s += factor * substitution[letter] factor *= 10

return s
def solve2(equation):

_____
left, right = equation.lower().replace(' ', '').split('=')
left = left.split('+')
letters =
set(right) for

word in left:
for letter in word:

letters.add(letter) letters = list(letters)

digits = range(10)
for perm in itertools.permutations(digits,
```

```

len(letters)): sol = dict(zip(letters, perm))

if sum(get_value(word, sol) for word in left) ==
get_value(right,

sol): print(' + '.join(str(get_value(word, sol)) for
word in left) +

" = {}
(mapping: {})" .format(get_value(right, sol),

sol)) print('EAT + THAT = APPLE ') solve2('POINT
+ ZERO = ENERGY ')

```

OUTPUT SCREENSHOT:

The screenshot shows the AWS Cloud9 IDE interface. The main editor displays a Python script named `exp3.py` with the following code:

```

1 import itertools
2
3 def get_value(word, substitution):
4     s = 0
5     factor = 1
6     for letter in reversed(word):
7         s += factor * substitution[letter]
8         factor *= 10
9     return s
10
11 def solve2(equation):
12     left, right = equation.lower().replace(' ', '').split('=')
13     left = left.split('+')
14     letters = set(right)
15     for word in left:
16         for letter in word:
17             letters.add(letter)
18     letters = list(letters)
19
20     digits = range(10)
21     for perm in itertools.permutations(digits, len(letters)):
22         sol = dict(zip(letters, perm))
23
24         if sum(get_value(word, sol) for word in left) == get_value(right, sol):
25             print(' + '.join(str(get_value(word, sol)) for word in left) + " = {} (mapping: {})".format(get_value(right, sol), sol))
26
27 print('EAT + THAT = APPLE ')
28 solve2('POINT + ZERO = ENERGY ')

```

The output terminal at the bottom shows the execution results:

```

EAT + THAT = APPLE
71582 + 9861 = 80643 (mapping: {'e': 0, 't': 2, 'o': 1, 'z': 9, 'y': 3, 'r': 6, 'g': 4, 'i': 5, 'n': 8, 'p': 7})
51762 + 9891 = 60643 (mapping: {'e': 0, 't': 2, 'o': 1, 'z': 9, 'y': 3, 'r': 8, 'g': 4, 'i': 7, 'n': 6, 'p': 5})
71385 + 9841 = 80426 (mapping: {'e': 0, 't': 5, 'o': 1, 'z': 9, 'y': 6, 'r': 4, 'g': 2, 'i': 3, 'n': 8, 'p': 7})

```

