

ACM Pacific NW Region Programming Contest
11 November 2000

PROBLEM B
Base Addition

Given 3 values, s_1 , s_2 , s_3 , what is the smallest integer having a base less than or equal to 36 such that $s_1 + s_2 = s_3$? Each string, s_1, s_2, s_3 , is composed of digits and upper case letters, with ASCII value ordering (0123?XYZ).

INPUT:

Groups of 3 strings (one per line) s_1 , s_2 , s_3 .
Each string will be at most 80 characters.
Each string will consist entirely of digits & upper-case letters.
Input will end with a single 0 alone on a line.
Thus, the total number of lines will be $3*k + 1$ (for some integer k).
There will be no leading zeros.
Input file for this problem is **b.dat**

OUTPUT:

For each triplet of s_1 , s_2 and s_3 , print one line of output (line-wrap is allowable for long strings):
If a value, x , is found that meets the criteria, print: $s_1 + s_2 = s_3$ in base x
If no answer exists, print: $s_1 + s_2 \neq s_3$

SAMPLE INPUT:

```
5
3
10
5
3
11
5
3
8
5
3
7
ABC
DEF
18AB
11111111111111111111
22222222222222222222
33333333333333333333
0
```

SAMPLE OUTPUT:

```
5 + 3 = 10 in base 8
5 + 3 = 11 in base 7
5 + 3 = 8 in base 9
5 + 3 != 7
ABC + DEF = 18AB in base 16
11111111111111111111 + 22222222222222222222 = 33333333333333333333 in base 4
```