



Computer Science Olympiad
Pennsylvania State University
Hazleton Campus
First Round, Spring 2011

Deadline: February 17, 2011

Problem 1 [*Prime Numbers*] Given an integer positive N . Write a program that calculates two prime numbers p and q (if it possible), such that: $N = p + q$

Example:

$$N = 48, p = 17, q = 31$$
$$48 = 17 + 31$$

Input:

N // N - integer positive

Output:

p q // (1) prime numbers

// or

No solution // (2) there are no prime numbers

// p and q such that $n = p + q$

Problem 2 [*Math Rebus*] Write a program to solve the following math rebus:

$$\begin{array}{r} \text{BDAC} \\ + \\ \text{BCA} \\ \hline \text{BECC} \end{array}$$

where:

$A, B, C, D, E \in \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$, A, B, C, D and E are decimal digits

No input Data

Output:

The values of all decimal digits: A, B, C, D and E

Problem 3 [*Three-digits integers*] N is a four-digit positive integer number. Write a program to find three three-digits positive integers p , q and r , such that:

(1) $N = p + q + r$

(2) The numbers p , q , and r consists of only three decimal digits $\{a, b, c\}$.

Example:

$$N = 1986 \text{ (given number), } p = 222, q = 772, \text{ and } r = 992$$

$$N = 222 + 772 + 992$$

$$a = 2, b = 7, c = 9.$$

Input:

N // N - integer positive

a b c // Three decimal digits

Output:

p q r // Three integers satisfying the properties (1) & (2)