B • Sum Squared Digits Function

The Sum Squared Digits function, $SSD(b, n)$ of a positive integer $n$, in base $b$ is defined by representing $n$ in base $b$ as in:

$$n = a_0 + a_1b + a_2b^2 + \ldots$$

then:

$$SSD(b, n) = a_0^2 + a_1^2 + a_2^2 + \ldots$$

is the sum of squares of the digits of the representation.

Write a program to compute the Sum Squared Digits function of an input positive number.

Input

The first line of input contains a single decimal integer $P$, $(1 \leq P \leq 10000)$, which is the number of data sets that follow. Each data set should be processed identically and independently.

Each data set consists of a single line of input. It contains the data set number, $K$, followed by the base, $b$ $(3 \leq b \leq 16)$ as a decimal integer, followed by the positive integer, $n$ (as a decimal integer) for which the Sum Squared Digits function is to be computed with respect to the base $b$. $n$ will fit in a 32 bit unsigned integer.

Output

For each data set there is a single line of output.

The single line of output consists of the data set number, $K$, followed by a single space followed by the value of $SSD(b, n)$ as a decimal integer.