Problem A. BBP Formula

In 1995, Simon Plouffe discovered a special summation style for some constants. Two year later, together with the paper of Bailey and Borwien published, this summation style was named as the Bailey-Borwein-Plouffe formula. Meanwhile a sensational formula appeared. That is

$$\pi = \sum_{k=0}^{\infty} \frac{1}{16^k} \left(\frac{4}{8k+1} - \frac{2}{8k+4} - \frac{1}{8k+5} - \frac{1}{8k+6} \right).$$

For centuries it had been assumed that there was no way to compute the n-th digit of π without calculating all of the preceding $n-1$ digits, but the discovery of this formula laid out the possibility. This problem asks you to calculate the hexadecimal digit n of π immediately after the hexadecimal point. For example, the hexadecimal format of π is $3.243F6A8885A308D313198A2E\cdots$ and the 1-st digit is 2, the 11-th one is A and the 15-th one is D.

Input

The first line of input contains an integer T ($1 \le T \le 32$) which is the total number of test cases.

Each of the following lines contains an integer n ($1 \le n \le 100000$).

Output

For each test case, output a single line beginning with the sign of the test case. Then output the integer n, and the answer which should be a character in $\{0, 1, \cdots, 9, A, B, C, D, E, F\}$ as a hexadecimal number.

Sample

5 1 11 111 1111 11111	Case #1: 1 2 Case #2: 11 A Case #3: 111 D Case #4: 1111 A Case #5: 11111 E