**4. Electrostatics**

# Program Name: Electrostatics.java Input File: electrostatics.dat

You are learning about electrostatics in your Physics class, and you’ve just learned four important terms that are all somewhat related: Electric Force (F), Electric Field (E), Electric Potential Energy (U), and Electric Potential (V). The equations for these values are as follows:

F = (kQq)/(d^2)

E = (kQ)/(d^2)

U = (kQq)/d

V = (kQ)/d

Where k is a constant 9.0 x 10^9.

Given values for Q, q, and d, use the equations to find force, field, energy, or potential.

**Input**

The first line of input will contain a single integer n that indicates the number of test cases. The next n lines will contain a character either F, E, U, or V indicating which value to solve for, Q, q, and d.

**Output**

Output the requested value rounded to 3 or less significant figures in scientific notation.

**Example Input File**

6

F 0.000001 0.000001 0.1

E 0.000001 0.000001 0.1

U 0.000001 0.000001 0.1

V 0.000001 0.000001 0.1

E 20 3 4

V 5 6 7

**Example Output to Screen**

9E-1

9E5

9E-2

9E4

1.13E10

6.43E9