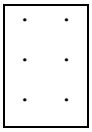
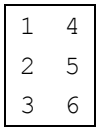
2. Braille Student

Program Name: Braille.java Input File: braille.dat

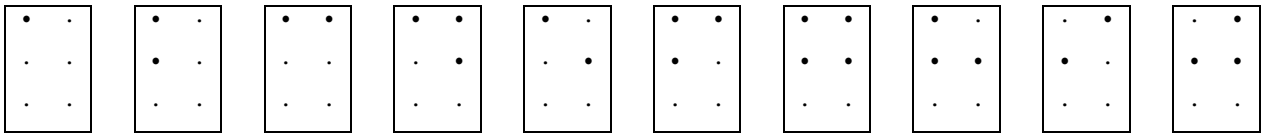
In the early 1800's, Louis Braille invented what is now called the Braille system that many visually impaired students use today. Aaron is a new student at your school and has to have his papers transcribed into Braille so he can read them. You have decided to write a program that will read a stream of Braille characters and print the corresponding letters or numbers.

Braille characters are formed by a matrix of dots in a cell with 3 rows and 2 columns. The dot in each of the six positions of a cell is either raised (bold) or flat (not-bold). A diagram of the dot positions is at the right.





The matrix of dots in a cell is used to distinguish between letters, digits, and special characters such as punctuation marks and diacritics. For instance, the following cells can represent the letters a-j or the digits 1-0 as described below.



a or 1 b or 2 c or 3 d or 4 e or 5 f or 6 g or 7 h or 8 i or 9 j or 0

All cells represent a space, a punctuation mark, a letter, a digit, or a "sign" to switch between upper and lower case letters and digits using the following Braille rules:

- At the beginning of a message, the default interpretation is a lower case letter.
  - The cells in the diagrams shown above represent the letters a-j.
  - Letters k-t are represented a dot in position 3 plus the code for letters a-j. For example, a cell representing the letter k would have dots 1 and 3 raised.
  - Letters u, v, x, y, and z are represented by dots in positions 3 and 6 plus the code for a, b, c, d, and e respectively.
  - There was no letter w in the French alphabet that Braille used but has since been added as 3 and 6 plus the code for j.
- A "sign" is used to switch between upper and lower case letters and digits. There is one number sign, and three letter signs:
  - **Number sign:** a cell that contains the dots 3, 4, 5, and 6. All cells following a number sign represent single digits, 1 through 0 as shown above, until a space or one of the three letter signs below is encountered.
  - **Letter signs:**
    - **letter sign** is a cell that contains the dots 5 and 6. The cells continue to represent lower case letters until a different sign is encountered.
    - **capital letter sign** is a cell that contains only a dot in location 6. Only the letter in the cell following the capital letter sign is capitalized and the remaining cells represent lower case letters until a different sign is encountered.
    - **all capital letter sign** is represented by two consecutive capital letter signs. All letters will be capitalized until a different sign is encountered.
- A space is represented by a blank cell.
- The only punctuation mark for this problem is a period, represented by a cell containing dots 2, 5, and 6.

Input

The first line of input will contain a single integer `n` that indicates the number of Braille phrases to follow. Each of the Braille phrases will consist of contiguous cells each of which contains 3 rows and 2 columns of ones and zeroes and represent Braille code as described above. A one represents a dot and a zero represents no dot.

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2. Braille Student (cont.)

Output
You will print the English phrase represented by the Braille code.

Example Input File
```
2
1000111011001010010001100000111010100100
0000010111001100100001010000101001001011
0000001000000000010001100000100100000001001
0011101111100110100000000111010110111110
0000010010001101110000000100010010100001
0100101010111000100001011000000000100000
```

Example Output to Screen
```
a dog has 5 Fleas.
Computer SCIENCE
```