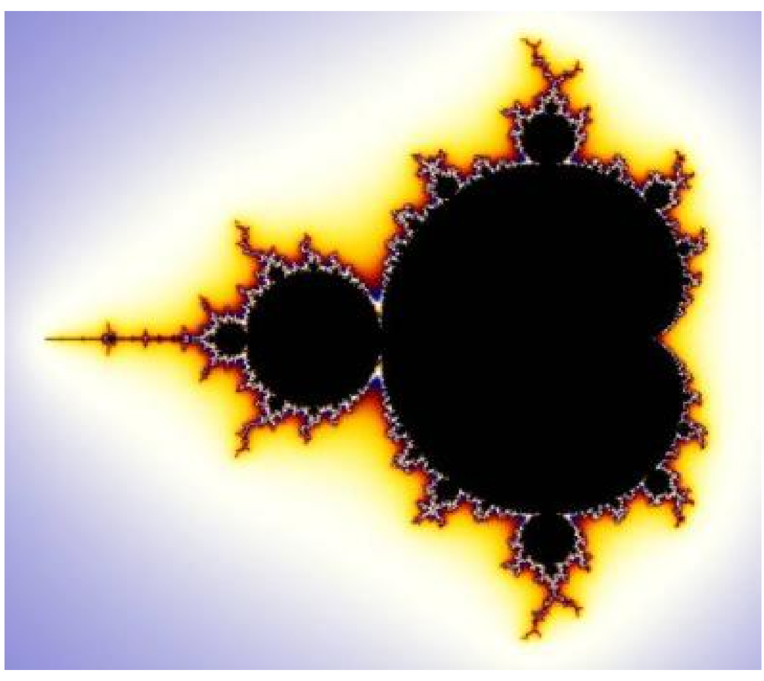
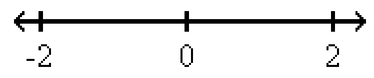


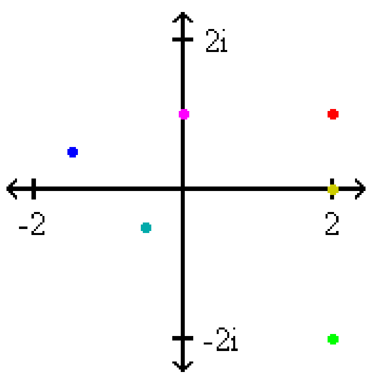
The Mandelbrot set, named after Benoit Mandelbrot, is a **fractal**. Fractals are beautiful objects that display self-similarity at various scales. Magnifying a fractal reveals small-scale details similar to the large-scale characteristics. Although the Mandelbrot set is self-similar at magnified scales, the small scale details are not identical to the whole. In fact, the Mandelbrot set is infinitely complex. Yet the process of generating it is based on an extremely simple equation involving complex numbers.

The Mandelbrot set is a mathematical set, a collection of **complex numbers**. Remember that complex numbers have two parts: a real one and an imaginary one. The imaginary part is equal to a real number times a special number called i. For example, a valid complex number is $2.5 + 3i$.

The number i was invented because no real number can be squared (multiplied by itself) and result in a negative number. The number i is defined to be the square root of -1. So when you square an imaginary number you can get a negative number. For example, $3i$ squared is -9.

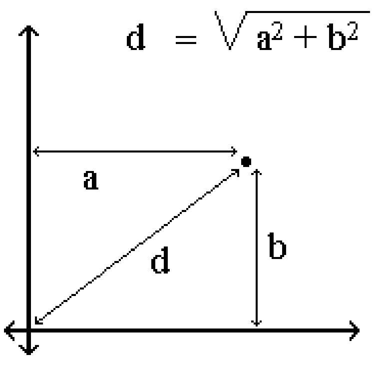


Real numbers can be represented on a one dimensional line called the real number line. Negative numbers like -2 are plotted to the left of zero and positive numbers like 2 are plotted to the right of zero. Any real number can be graphed on the real number line.



Since complex numbers have two parts, a real one and an imaginary one, we need a second dimension to graph them. We simply add a vertical dimension to the real number line for the imaginary part. Since our graph is now two-dimensional, it is a plane, the complex number plane. We can graph any complex number on this plane. The dots on this graph represent the complex numbers: $[2 + 1i]$, $[-1.5 + 0.5i]$, $[2 - 2i]$, $[-0.5 - 0.5i]$, $[0 + 1i]$, and $[2 + 0i]$.

The Mandelbrot set is a set of complex numbers, so we graph it on the complex number plane. However, first we have to find many numbers that are part of the set. To do this we need a test that will determine if a given number is inside the set or outside the set. The test is based on the equation $Z = Z^2 + C$. C represents a constant number, meaning that it does not change during the testing process. C is the number we are testing, the point on the complex plane that will be plotted when testing is complete. Z starts out as zero, but it changes as we repeatedly iterate this equation. With each iteration we create a new Z that is equal to the old Z squared plus the constant C. So the number Z keeps changing throughout the test.



We're not really interested in the actual value of Z as it changes, we just look at its magnitude. The magnitude of a number is its distance from zero.To calculate the magnitude of a complex number, we add the square of the number's distance from the x-axis (the horizontal real axis) to the square of the number's distance from the y-axis (the imaginary vertical axis) and take the square root of the result.

As we iterate our equation, Z changes and so does its magnitude. The magnitude of Z will do one of two things. It will either stay equal to or below 2 forever, or it will eventually surpass two (strictly bigger than 2). Once the magnitude of Z surpasses 2, it will increase forever. In the first case, where the magnitude of Z stays small, the number we are testing is part of the Mandelbrot set. If the magnitude of Z eventually surpasses 2, the number is not part of the Mandelbrot set.

As we test many complex numbers we can graph the ones that are part of the Mandelbrot set on the complex number plane. If we plot thousands of points, an image of the set will appear, as illustrated in the figure in the upper right corner. We can add color to the image if we add colors to the points that are not inside the set, according to how many iterations were required before the magnitude of `Z` surpassed two.

To make exciting images of tiny parts of the Mandelbrot set, we just zoom in on it, trying to perceive its full infinite beauty.

Your task is to plot a region of the Mandelbrot set using only simple text, this is, only with ASCII characters.

Input

The first line of input contains an integer T which is the number of test cases that follow.

Each test case is given in a line with the following format:

"$CHARS$ $MINI$ $MAXI$ $PRECI$ $MINR$ $MAXR$ $PRECR$", where

- $CHARS$ represents the set of chars to use in the plotting, always enclosed in quotes, and always with size 12 (the set of chars never includes quotes and spaces);
- $MINI$ and $MAXI$ are two real numbers representing the lower and upper bound of the imaginary part in the plot;
- $MINR$ and $MAXR$ are two real numbers representing the lower and upper bound of the real part in the plot;
- $PRECI$ and $PRECR$ are two real numbers representing the precision that the plot must have in what respects to imaginary and real part, respectively.

What you must do is to plot the following graph:

```
[MINI         , MINR] [MINI         , MINR+PRECR] (...)
[MINI+PRECI   , MINR] [MINI+PRECI   , MINR+PRECR] (...)
[MINI+2*PRECI, MINR] [MINI+2*PRECI, MINR+PRECR] (...)
(...)                 (...)                       (...)
(...)                 (...)                       [A,B]
```

where $[A, B]$ are the last coordinates that are smaller or equal than $[MAXI, MAXR]$.

Each one of this coordinates must be plotted as a single char. If one iteration was required before the magnitude of Z surpassed two, then the first char of $CHARS$ is plotted, if two iterations are needed, then the second char is plotted and so on until 12 iterations. If after twelve iterations the magnitude of Z has not surpassed 2, then the char " " (space) is plotted.

Output

The output consists of the required number of lines and columns to plot the specified region of the Mandelbrot set. All lines in output should be terminated with a newline.

Different test cases should be separated by a single blank line.

Sample Input

```
2
"#$&/|[]+;:-." -1.2 1.2 0.1 -2 1 0.05
"1234567890AB" -1.2 -0.8 0.02 -0.5 0.5 0.02
```

Sample Output

```
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44444444455556 68A086666655444444444433333333332222
444444444555556670 A876677654444444444333333333222
4444444555556667   08778A75544444444433333333333322
444444555555666790  99AA  655444444444433333333333 2
444444555555667889  B   A766544444444443333333333333
4444455555556677889A   A987665544444444443333333333
4444555555566778 80A  B098766554444444444333333333333
44455555556677889A    A98776555444444444333333333333
4455555556677899       98876655554444444444433333333
4555555566789 0AB      0988765555444444444444333333
555555566680B          AAB 8665555554444444444 33333
5555566667A               B876555555554444444433333
55566666789AB              A76655555555544444443333
566666677880B             B97766555555555444444433 3
```