

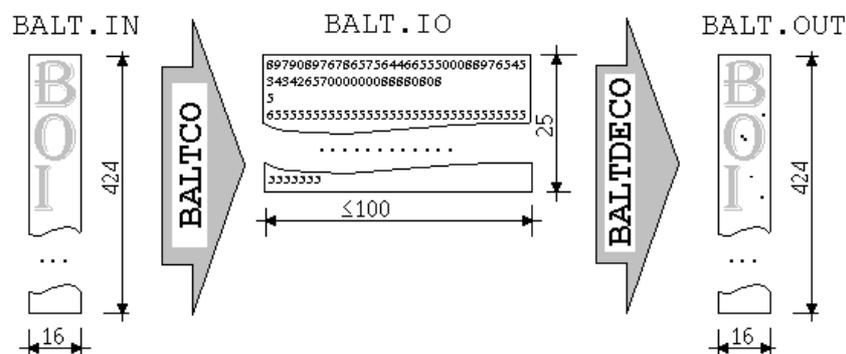
Baltic codes (EST, 1 min per test, 40 points)

In this task we consider texts consisting of letters a...z, A...Z and space. The symbols of the texts are represented by 16x16 matrices consisting of 0 and 1. Some symbols look like printed text, some can be handscript-like. Some of them are very bold and some are written with thin lines. The letters may reach the edges of the matrix but they also can be smaller (but the height of highest letters is at least 8 pixels).

We assume that our text documents are divided for sending from one computer to another in chunks of 25 symbols. Each such chunk is converted by the program BALTCO into a package of 25 text lines containing from 1 to 100 digits 0..9 and sent to another computer. The program BALTDECO converts the package back to 25 symbol matrices. It is desirable that the result differs from the initial picture by no more than 10 corrupted pixels in each symbol.

Task

Fix some way of coding the document chunks by 25 lines of the digits and write two programs: BALTCO for coding a text chunk, BALTDECO for decoding.



Input data of BALTCO

The input file BALTCO.IN contains 424 lines and consists of 25 symbol matrices separated by one blank line. Different words of the text can be written using different font. The file BALTCO.IN on your disk begins with symbol B:

```

1111111111111100
011100000000110
011100000000011
011100000000011
011100000000011
011100000000011
011100000000011
011100000000110
0111111111111100
011100000000110
011100000000011
011100000000011
011100000000011
011100000000011
011100000000011
011100000000011
011100000000110
1111111111111100

```

Output data of BALTCO

Output file BALT.IO must contain 25 lines of length at least 1 and no more than 100 filled with decimal digits (without spaces).

Input data of BALTDECO

The lines of digits from file BALT.IO is used as input data of BALTDECO.

Output data of BALTDECO

BALTDECO must write in output file BALT.OUT the 25 symbols of initial text in the same format as BALT.IN. Each symbol matrix should differ from initial input by no more than 10 corrupted pixels.

Grading

There will be 8 tests for this task. The result for a test is computed by following formula:

$$\frac{(\text{total number of digits in jury's solution for this test}) \times 5}{(\text{total number of digits in your BALT.IO}) \times 2^w}$$

where w is the number of symbols forwarded with more than 10 corrupted points. Maximal possible score for a test is 7 points (it is clear that some coding can be much more effective for some test). The maximal possible overall score for this problem is 40, however.

Additional

The program BALTTEST.EXE on your disk compares files BALT.IN and BALT.OUT and reports in BALTTEST.OUT about corrupted pixels in every symbol matrix (the number of matrices in the files can be less than 25).

Star (LAT, 6 sec per test, 30 points)

The board contains 48 triangular cells. In each cell one digit from 0 to 9 is written. Each cell belongs to two or three lines, which are marked by letters from A to L. One possible disposition of digits in cells is shown on figure 1. In this example the cell with 9 belongs to lines D, G and I, but cell with 7 - to B and I.

There is known the greatest digit, which is written in line cells for each line. In the given example the greatest digit in line A is 5, in line B - 7, in line E - 6, in line H - 0, in line J - 8, and so on.

Your goal is to write a program STAR which for given greatest digit in each of twelve lines determines the least and the greatest possible sum of digits in all board cells.

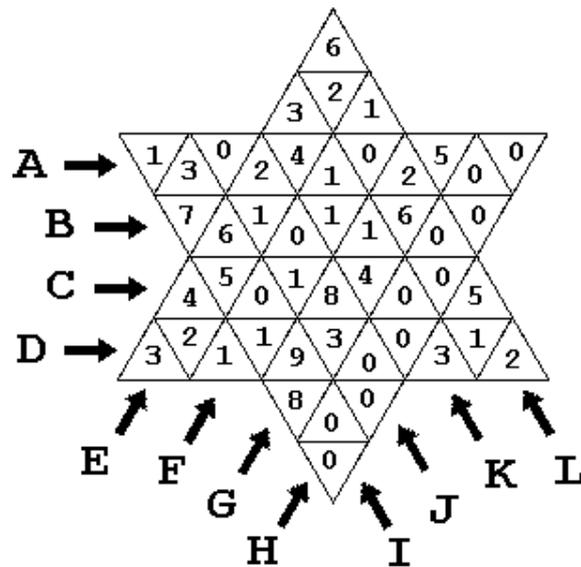


Figure 1

INPUT DATA

The first line of text file STAR.IN contains twelve digits - the greatest digit in line A, the greatest digit in line B, ..., the greatest digit in line L, respectively. Each two neighbour digits are separated by one space character. An example:

```
5 7 8 9 6 1 9 0 9 8 4 6
```

OUTPUT DATA

The output text file STAR.OUT must contain two integers in the first line: the least and the greatest possible sum of digits in all board cells. Values must be separated by single space character.

If it is not possible to dispose digits in cells to fulfil all given conditions, the text "NO SOLUTION" must be written in the first file line.

For the input example, the output file should be:

```
40 172
```

Floor (LIT, 10 sec per test, 30 points)

There is a big palace having N rooms and M passages connecting those rooms. From each room every other room can be reached without going outside of the palace. There may be more than one passage connecting two rooms. There are several entrances (they also can serve as exits) to the palace.

The floors of all the passages have to be covered with parquetry in one day. The parquetry is glued to the background and it is not allowed to walk on the parquetry for 24 hours after it has been laid out. The workers doing the job would like to avoid walking through a passage without installing the parquetry. Your task is to write a program FLOOR to find out if this is possible, and if so, to determine in which order the passages will have to be laid out with parquetry. It is permitted to walk in and out of the palace as many times as necessary.

INPUT DATA

On the first line of the input file FLOOR.IN there are given the number of rooms N ($1 \leq N \leq 100$) and the number of passages M ($1 \leq M \leq 500$) and the number of entrances E ($1 \leq E \leq 50$).

On the second line there are E numbers - the numbers of the rooms that can be used as entrances (exits). In each of the following M lines are given 2 integer numbers - the numbers of the rooms the passage connects.

Here is an example of input file:

```
5 5 1
2
1 5
1 2
2 3
3 4
4 5
```

OUTPUT DATA

should be written to the file FLOOR.OUT. If there is no possibility to complete the task write the message "NO", otherwise write the numbers of the rooms in the order in which they will have to be passed when covering passages with parquetry, one number per line. The route must start in a room with entrance and end in a room with exit. A possible output file for the input example given above could be:

```
2
1
5
4
3
2
```