

Problem E. Enigmatic Matrix

Input file: enigmatic.in
Output file: enigmatic.out
Time limit: 2 seconds
Memory limit: 512 mebibytes

Eleanor likes brackets. She likes correct bracket sequences most of all. A word w composed of ‘(’ and ‘)’ characters is called a correct bracket sequence if the following two conditions are satisfied:

- w has the same number of opening and closing brackets;
- the number of opening brackets in any prefix of w is greater or equal to the number of closing brackets in that prefix.

For example, “(())()” or “()()()” are correct brackets sequences, but “(((()” or “()())” are not.

Eleanor wants to generalize the notion of the correct bracket sequence to matrices, but her first attempt that any row and any column must be a correct bracket sequence failed: there are clearly no such matrices.

Her second attempt is the following definition of an *enigmatic* bracket matrix.

The matrix composed of ‘(’ and ‘)’ characters is called enigmatic, if each of its rows is a cyclic shift of some correct bracket sequence, and each of its columns is a cyclic shift of some correct bracket sequence.

A word x is a cyclic shift of a word y if $x = uv$ and $y = vu$ for some (possibly empty) words u and v .

For example, the picture below shows an enigmatic 4×4 matrix.

```
( ( ) )  
( ) ( )  
) ( ) (  
) ) ( (
```

Now Eleanor wants to count the number of different $h \times w$ enigmatic matrices. Help her! The answer must be printed modulo 998 244 353.

Input

The input file contains several test cases. Each test case consists of two integers h and w on a line ($2 \leq h, w \leq 16$, h and w are even). The last test case is followed by a line that contains two zeroes. It must not be processed.

Output

For each test case output one integer: the number of enigmatic $h \times w$ matrices modulo 998 244 353.

Examples

enigmatic.in	enigmatic.out
4 4 0 0	90