Chromatic Complex

Input file:	**standard input**
Output file:	**standard output**
Time limit:	6 seconds
Memory limit:	1024 megabytes

Please refer to the statements in the attachment files

Input

Please refer to the statements in the attachment files

Output

Please refer to the statements in the attachment files

Example

standard input	standard output
2 3 5 3 2 1 1 00000 11211 11011 1 4 3 1 3 5 1 5 1 1 1 1 01121 1 5	2 -1

Note

Please refer to the statements in the attachment files