Harmonic Strings

Today, professor Awk teaches Bash about binary strings and their various beautiful properties. A binary string of length n consists of exactly n characters, which are either 0 or 1.

Given a binary string, we can always decompose it into `runs`, each run is a **maximal** contiguous block of equal characters. For example, the binary string `111001101000` can be decomposed into 6 runs: `111`, `00`, `11`, `0`, `11`, and `000`. We call a run with only 0 a zero-run, and a run with only 1 a one-run.

For a binary string w, professor Awk is interested in the two following values:

- L_0: the length of the longest zero-run of w,
- S_1: the length of the shortest one-run of w.

Note that if w doesn't have any zero-runs, L_0 is set to 0. If w doesn't have any one-runs, S_1 is set to 0.

Professor Awk then asks Bash to help him find a Harmonic String w, which is a binary string that satisfies all the following conditions:

- The number of 1 in w must be exactly k.
- The value $L_0 \cdot (n+1) - S_1$ is minimal.

Input

The first line of the input contains τ ($1 \le \tau \le 10^5$) – the number of test cases. τ test cases follow, each is presented by a single line with two integers n and k ($1 \le n \le 10^5, 0 \le k \le n$).

It is guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case, print a Harmonic string. If there are multiple optimal solutions, you can print any of them.

Sample Input 1	Sample Output 1
2 3 2 4 2	110 0110

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