Triangulation

A \textit{triangulation} of a polygon is a set of triangles with vertices at the vertices of a polygon. These triangles must not overlap and must cover the whole polygon.

We define a polygon \textit{cut} as a straight line separating the polygon into two pieces.

Given a triangulated convex polygon, where each triangle has some color, find the maximal number of cuts one can do so that \textbf{no} two points of the same color end up in two different pieces.

\begin{center}
\begin{tikzpicture}
\draw (1,1) -- (2,2) -- (3,1) -- (4,1) -- (5,2) -- (1,1);\draw[dashed] (1,1) -- (2,2) -- (3,1);\node at (1.5,1.5) {4};\node at (0.5,0) {5};\node at (1.5,0) {3};\node at (3,1.5) {1};\node at (2,2.5) {2};\node at (4.5,1.5) {3};\node at (6,2) {6};\node at (6,0) {2};\node at (7.5,1.5) {1};\node at (7.5,0) {4};\node at (6,1) {5};
\end{tikzpicture}
\end{center}

\textbf{Input}

The input is read from standard input. The first line contains the number of vertices, \( n \). Vertices are numbered with unique integers between 1 and \( n \). Each of the next \( n - 2 \) lines contains four integer numbers \( a, b, c, d \) \((1 \leq a, b, c, d \leq n)\), meaning that the triangle which has its vertices in \( a, b, c \) has the color \( d \). \( a, b, c \) are three different vertices. The input always contains data about a proper triangulation of a polygon and all triangles are colored.

\textbf{Output}

The program should write one line to standard output, containing one integer — the maximal number of cuts.

\textbf{Example 1}

\begin{center}
\begin{tabular}{|c|c|}
\hline
\textbf{Input} & \textbf{Output} \\
\hline
5 \\
1 2 3 2 \\
4 5 1 1 \\
3 1 4 2 \\
\hline
1 \\
\hline
\end{tabular}
\end{center}
Example 2

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>1 4 2 1</td>
<td></td>
</tr>
<tr>
<td>2 4 5 2</td>
<td></td>
</tr>
<tr>
<td>6 2 5 3</td>
<td></td>
</tr>
<tr>
<td>3 6 5 1</td>
<td></td>
</tr>
</tbody>
</table>

Constraints

3 ≤ $n$ ≤ 100,000.

Grading

For test cases worth 50% of the total score, $n$ ≤ 5000