Uniting Manchester

The City of Manchester has two football teams – Manchester City and Manchester United. Every street in the city supports either City or United. If a street supports City, the street is painted blue. On the other hand, if a street supports United, it is painted red.

City and United fans hate each other. A City fan will never walk on a red street. On the other hand, an United fan will never walk on a blue street. As a result, sometimes fans cannot walk from one place to another.

In order to resolve this problem, the Mayor has decided to build some new streets. The new streets will stay neutral and will be painted black. However building streets is costly, so the mayor wants to construct as few new streets as possible.

The City of Manchester consists of n intersections numbered from 1 through n. There are also m bidirectional streets, numbered from through 1 to m . Street i connects intersections $u[i]$ and $v[i]$ and its colour is represented by $c[i]$. If $c[i] = 0$, the street is coloured blue. If $c[i] = 1$, it is coloured red.

The mayor will construct some new black streets such that -

1. For any two intersections (u, v) there exists a path from u to v using only red and black streets.
2. For any two intersections (u, v) there exists a path from u to v using only blue and black streets.

You must find the minimum number of black streets needed to satisfy the above condition. You also have to find a set of black streets of minimum size.

Input

Read the input from the standard input in the following format:

- line 1: $\quad n \quad m$
- line $1 + i$ $(1 \le i \le m)$: $\quad u[i] \;\; v[i] \;\; c[i]$

Output

Write the output to the standard output in the following format:

- line 1: $\quad K$, the minimum number of additional black streets needed.

- line $1 + i$ $(1 \leq i \leq K)$: $x[i]$ $y[i]$, the endpoints of the i-th black street added.

Streets can be printed in any order. If there are multiple solutions, output any of them.

Constraints

- $1 \leq n \leq 200\,000$
- $1 \leq m \leq 500\,000$
- $1 \leq u[i],\ v[i] \leq n$ (for all $1 \leq i \leq m$)
- $u[i] \neq v[i]$ (for all $1 \leq i \leq m$)
- $c[i] \in \{0, 1\}$ (for all $1 \leq i \leq m$)

Subtasks

1. (9 points) For each intersection u, there exists a path from 1 to u using only red streets.
2. (14 points) Each intersection is adjacent to exactly one red street and one blue street.
3. (32 points) $n \leq 2000$
4. (27 points) For each intersection u, there exists a path from 1 to u using only red streets or using only blue streets.
5. (18 points) No further constraints.

You will be awarded 20% points for each subtask for only printing the minimum number of edges correctly.

Examples

Example 1

```
3 2
1 2 0
1 3 1
```

One correct output is:

```
1
2 3
```

You can also print `3 2` instead of `2 3`.

Example 2

```
3 4
1 2 0
1 3 1
2 3 0
2 3 1
```

The correct output is:

```
0
```

All intersections are reachable from each other using only red edges and also using only blue edges. So, no edges need to be added.

Example 3

```
4 3
1 2 0
1 3 0
2 4 1
```

One correct output is:

```
2
1 4
2 3
```

Another correct output is:

```
2
1 2
3 4
```

There are also other correct outputs.