

2025 COLD WAR

The spies of *Alpha Complex* often find themselves blending in at diplomatic soirées. This can involve infiltration, coercion and eavesdropping, and experienced spies have very strong opinions on ICE. Notably a preference for their martinis containing either cubes (0) or slivers (1) of the substance.

Fortunately invitation reply cards for soirées always ask for ice preference, so the correct number of drinks are always prepared. Unfortunately when spies arrive they are so busy looking inconspicuous the drink they pick up might contain the wrong type of ice.

A group of n spies are attending a soirée. For all but one spy this includes their direct boss. Spies are naturally cautious but (due to social anxiety) will swap drinks with their direct boss. As no spy enjoys melted ice, the spies are looking for the minimum number of swaps required so that they all have their ice preference.

For example, suppose:

- The boss of spy 1 is 2, 3 is 2, 4 is 3 and 5 is 4;
- Initially spies 1, 4 and 5 have cubes and the others slivers;
- Spies 2, 3, 4 & 5 did not pick up their preferred drink;
- A sequence of swaps is 3 with 4, 2 with 3, 4 with 5, 3 with 4.

SAMPLE INPUT

```
5
2 0 0
0 0 1
2 0 1
3 1 0
4 1 0
```

The first line of the input will contain a single integer, n ($1 \leq n \leq 2^{20}$) indicating the number of spies. This will be followed by n lines, the i^{th} containing details for spy i . Each line will contain three integers, an integer indicating their direct boss (or 0 if they are the spy without their boss present), their ice preference (0 or 1) followed by the ice in the drink they picked up on arrival.

If you submit your solution to *Cold War Zero*: Your output should contain a single integer, the minimum number of swaps required to ensure the spies have their preference.

SAMPLE OUTPUT (CW0)

```
4
```

If you submit your solution to *Cold War One*: The first line of your output should be the minimum number of swaps required to ensure the spies have their preference. This should be followed, in order, by the swaps required: one swap should appear per line and each line should contain a single integer, indicating that this spy swaps their drink with their boss. If the number of swaps required exceeds 2^{20} you should *only* output the first 2^{20} swaps.

SAMPLE OUTPUT (CW1)

```
4
4
3
5
4
```