



# Roads in HackerLand

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Problem

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John lives in HackerLand, a country with  $N$  cities and  $M$  bidirectional roads. Each of the roads has a distinct length, and each length is a *power of two* (i.e., 2 raised to some exponent). It's possible for John to reach any city from any other city.

Given a map of HackerLand, can you help John determine the sum of the minimum distances between each pair of cities? Print your answer in [binary representation](#).

## Input Format

The first line contains two space-separated integers denoting  $N$  (the number of cities) and  $M$  (the number of roads), respectively. Each line  $i$  of the  $M$  subsequent lines contains the respective values of  $A_i$ ,  $B_i$ , and  $C_i$  as three space-separated integers. These values define a bidirectional road between cities  $A_i$  and  $B_i$  having length  $2^{C_i}$ .

## Constraints

- $1 \leq N \leq 10^5$
- $1 \leq M \leq 2 \times 10^5$
- $1 \leq A_i, B_i \leq N, A_i \neq B_i$
- $0 \leq C_i < M$
- If  $i \neq j$ , then  $C_i \neq C_j$ .

## Output Format

Find the sum of minimum distances of each pair of cities and print the answer in [binary representation](#).

## Sample Input

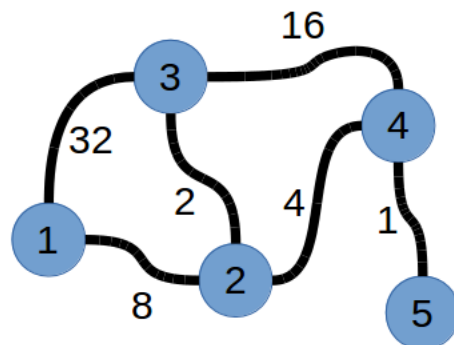
```
5 6
1 3 5
4 5 0
2 1 3
3 2 1
4 3 4
4 2 2
```

## Sample Output

```
1000100
```

## Explanation

In the sample, the country looks like this:



Let  $d(x, y)$  be the minimum distance between city  $x$  and city  $y$ .

$$d(1, 2) = 8$$

$$d(1, 3) = 10$$

$$d(1, 4) = 12$$

$$d(1, 5) = 13$$

$$d(2, 3) = 2$$

$$d(2, 4) = 4$$

$$d(2, 5) = 5$$

$$d(3, 4) = 6$$

$$d(3, 5) = 7$$

$$d(4, 5) = 1$$

$$Sum = 8 + 10 + 12 + 13 + 2 + 4 + 5 + 6 + 7 + 1 = (68)_{10} = (1000100)_2$$

f t in

Submissions: [843](#)

Max Score: 60

Difficulty: Medium

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Java 7

```

1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }

```

Line: 1 Col: 1

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