L

Maximize Profit

Time Limit	1 second
Memory Limit	32 MB

You decided to improve your trading skills by planning a trade route which will maximize profit. You start by researching your country and finally get some useful information. Your country has **N** cities and **M** one-way roads connecting between two distinct cities. Each city is denoted by a positive integer between **1** to **N**. For any pair of distinct cities **U** and **V**, it is possible to have multiple roads heading from city **U** to city **V**. By traveling and trading along each road **r**, you will have to spend D_r days on that road and your total assets will be increased (or decreased) by a factor of 2^{Xr} where X_r is a real number between **-1** and **1**. For example, let say that your start balance is **$20**. If you take a road which has value X_r **= 0.322**, then after taking this road your balance will become **$20** $* 2^{0.322} \approx$ **$25**. In other words, your assets will grow by a factor of $2^{0.322}$. But if you take a road which has value X_r **= -0.415**, then after taking this road your balance will become **$20** $* 2^{-0.415} \approx$ **$15**. In this case, your assets will not be considered as growing because your balance is not increasing but decreasing.

A trade route is a sequence of cities $\langle U_1, U_2, U_3, \ldots, U_K \rangle$ and there must exist a road from city U_i to city U_{i+1} for each $1 \le i < K$. If you select a sequence $\langle U_1, U_2, U_3, \ldots, U_K \rangle$ as your trade route, it means that you will start at city U_1, and then you will take a road which leads you directly to city U_2. Then, immediately, you will take a road heading to U_3, and so on, until you arrive at city U_K. It is possible that you may revisit some cities many times and if there are multiple roads heading from U_i to U_{i+1} you can choose any of them. If, after taking the route, you spend **D** days in total and your assets change from **A** to **B**, then your assets will be considered growing if the average factor $\sqrt[D]{B/A}$ is greater than one.

You are planning for a lifetime trading, which means that you will keep traveling and trading among these cities forever. How much can your assets grow per year (365 days) by selecting the best trade route possible? There is no restriction on the selection of the starting city.

Note that, with lifetime trading, it implies that the total amount of time you spend on these cities is infinite. Any finite-length trade routes will always be considered as not growing your assets (lifetime average).

INPUT

The first line of an input contains an integer **T** (**0 < T ≤ 10**) the number of test cases. Each test case starts with a line containing positive integers **N** and **M** (**1 < N ≤ 100**, **M ≤ 10^5**) where the number of cities and roads respectively. Each of the next **M** lines describes the detail of one road. Each road **r** is described with three integers U_r, V_r, D_r (**1 ≤** U_r, V_r **≤ N** and $U_r \neq V_r$ and **14 ≤** D_r **≤ 365**) and a real number X_r (**-1 ≤** X_r **≤ 1**) meaning that it takes D_r days to travel from city U_r to city V_r using this road and your assets will change by a factor of 2^{Xr}.

OUTPUT

An output of each test case will be a line "**Case #c: A**" where **c** is the test case number and **A** is a real number denoting the maximum growth (**A > 1**) per year you can achieve. If **A ≤ 0**, then display **A** as "**IMPOSSIBLE**" instead.

Please use "%.3lf" as a format to display real number output.

EXAMPLE

Sample Input	Sample Output
3 3 4 1 2 54 0.8 2 1 19 -0.2 1 3 14 1.0 3 2 21 -0.7 3 3 2 1 19 0.2 3 2 121 -0.5 3 1 34 1.0 3 5 1 2 54 0.8 2 1 19 -0.2 1 3 17 1.0 3 2 21 -0.3 2 3 365 0.45	Case #1: 8.000 Case #2: IMPOSSIBLE Case #3: 9.201

Explanation on Case #1:

Let select a trade route **<1, 2, 1, 2, 1, 2, 1, 2, ...>** which goes back and forth between city **1** and **2** forever. For each time you go from city **1** to city **2** and back to city **1**, you will spend **54 +**

19 = **73** days and your assets will grow by a factor of $2^{0.8} * 2^{-0.2} = 2^{0.6}$. By going back and forth forever, it means that you will continue the loop for **Z** times (where **Z** approaches infinity). The total days you spend is **73** * **Z** and your assets will grow by a factor of $(2^{0.6})^{Z}$. The growth per day is $\sqrt[73*Z]{(2^{0.6})^{Z}} = \sqrt[73]{2^{0.6}}$. Then, the growth per year can be calculated by $\left(\sqrt[73]{2^{0.6}}\right)^{365} = 2^{3} = 8$ which is maximum.

If you select a finite trade route **<1, 2>**, then the total assets growth is $2^{0.8}$ and the total time you spend on the route is **54** days. However, since you are considering about lifetime trading, it means that you will spend only **54** days on trading and then doing nothing for the rest of your life. In lifetime average, your assets growth per day is $\sqrt[Z]{2^{0.8}}$ (where **Z** approaches infinity because total lifetime is infinite) = **1**. Your assets growth per year is $1^{365} = 1$ which is not considered as growing.