Arrest Warrant

Ruffus the notorious, Bit**land** pirate has just become the most wanted person in all of Bitland's n cities, and not in a good way. Charles Xorvier is leading a team of his Mutexes to "lock" up the land pirate, Ruffus, once and for all. Charles starts in Southchester (id = 1). Xorvier will head towards Ruffus' hideout in Tarasoga (id = n).

Xorvier has a transport vehicle (BlackBoar) that can cover most terrains, but it becomes increasingly more expensive to use the more passengers Xorvier is transporting. Each "road" the BlackBoar travels requires some cost per passenger (including Xorvier) to traverse. Additionally, the BlackBoar has a maximum capacity of 20 passengers (including Xorvier).

Whenever Xorvier enters a city some pirates may be present. Xorvier being an upstanding citizen will subjugate all the pirates before moving to a different city. Xorvier can either bribe a pirate to join his groups of Mutexes or he can have a Mutex arrest a pirate. When a Mutex arrests a pirate he will spend the rest of his life filling out Bitland's paperwork regarding the arrest (a noble sacrifice indeed). The worst part is after Xorvier leaves the pirates are just replaced by another set of equal nasty pirates.

Xorvier has a large amount of funds, but transportation and bribing can be quite expensive. Please computer for Xorvier the cost to move to and subjugate Ruffus.

Important things

- You can assume that there will always be a path from Southchester to every other city, and Southchester will never have a pirate ambush.
- Xorvier will start his journey with 19 other Mutexes.
- Xorvier will never arrest a pirate himself unless he is in the city Tarasoga (Ruffus' hideout).
- Finally, the only Mutexes left behind when traveling in the BlackBoar will be those that have arrested a pirate.
- Each path the BlackBoar can take can be used in both directions.

Input Specification

The first line of input will contain 2 integers, n and m, $(2 \le n \le 10,000; n - 1 \le m \le 20,000)$, representing the number of cities and the number of roads the BlackBoar can travel.

The next n lines contain the description of the cities, the i-th of which will contain 2 integers, p_i and b_i, $(0 \le p_i \le 1,000; 1 \le b_i \le 1,000)$ representing the number of pirates and the cost to bribe one pirate respectively.

The next m lines contain the description of the possible routes for the BlackBoar, the i-th of which contains 3 positive integers, s_i, e_i, and c_i $(s_i \le n; e_i \le n; c_i \le 1,000)$ representing the id of the starting city, the id of the ending city, and the cost of using the path per passenger respectively.
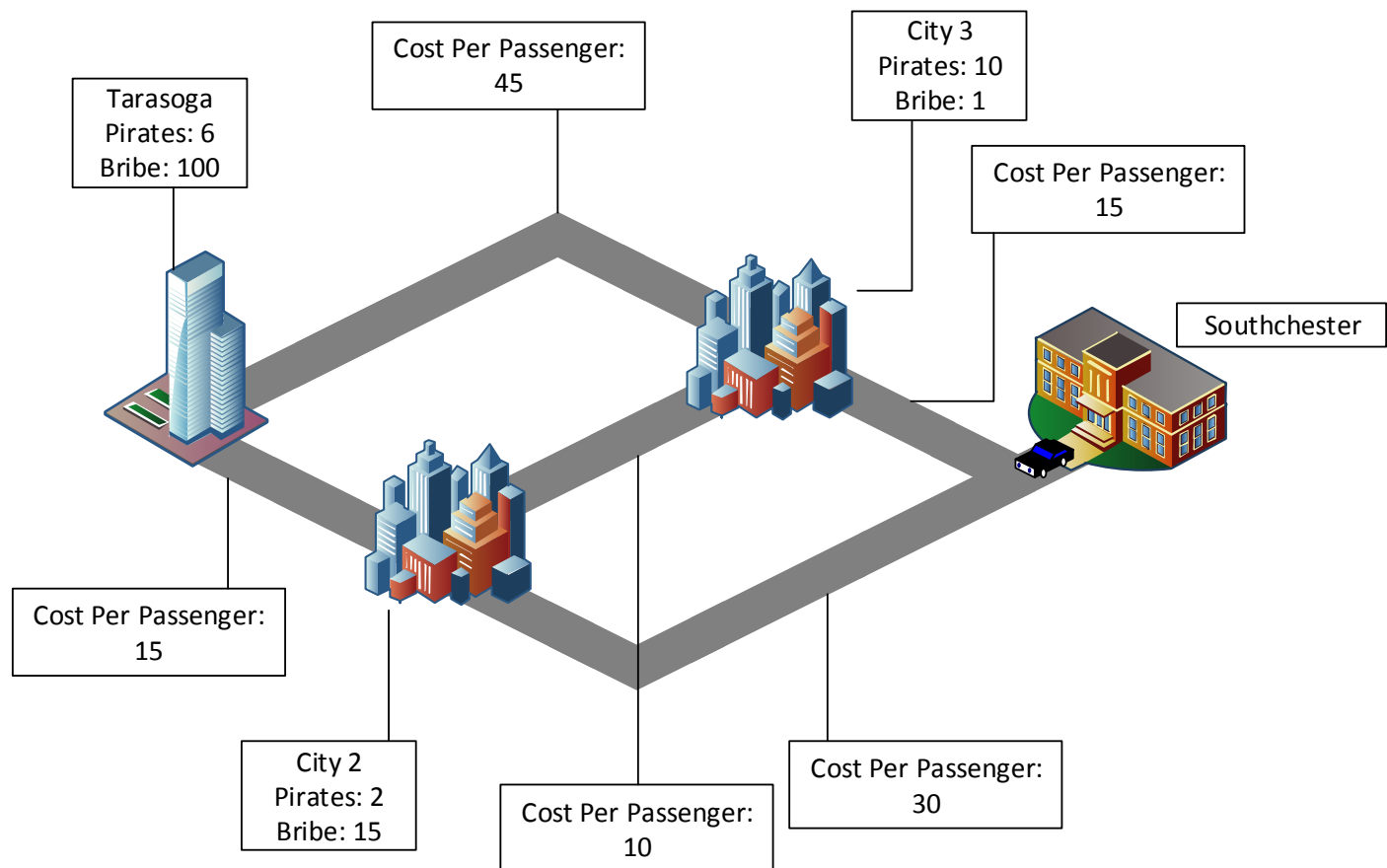
Output Specification

The first and only line of output should contain a number represent the minimum amount of money Xorvier will need to subjugate Ruffus.

Input Output Example

Input	Output
4 5 0 1 2 15 10 1 6 100 1 2 30 1 3 15 2 3 10 2 4 15 3 4 45	520
5 5 0 1 12 15 10 1 15 100 6 100 1 2 30 2 3 25 2 4 25 4 3 10 5 4 33	1289
5 5 0 1 4 1 10 1 3 100 6 100 1 2 30 2 3 100 2 4 10 4 3 10 5 4 33	1178

Explanation
Case 1:

The optimal route travels from Southchester to city 3. We bribe no pirates upon a rival and spend 300 coins to get there. We lose 10 Mutexes (now at 10).

We then travel to city 2. We spend 100 coins, and lose 2 Mutexes now at 8).

Lastly we travel to Tarasoga (city 4). We spend 120 coins, and stop.

We spent a total of 300 + 100 + 120 coins for a total of 520.

Case 2:

Travel to City 2. No bribe, so we lose 12 Mutexes. Spent 600. 8 Mutexes remain.

Travel to City 3. We "hire" all 10 Pirates for 10 coins. Spent 200 in travel. 18 Mutexes remain.

Travel to City 4. No bribe, so we lose 15 Mutexes. Spent 180 in travel. 3 Mutexes remain.

Travel to City 5. Bribe 2, and lock up 4 we lose a total of 2 Mutexes. Spend 200 in bribes and 99 in travel. Only Xorvier remains.

The total money spent is 600 + 200 + 10 + 180 + 99 + 200 = 1289

Case 3:

Travel to city 2. We do not bribe, and lose 4 Mutexes. Spend 600. 16 Mutexes left.

We travel to city 4, and do not bribe again losing another 3 Mutexes. Spend 160. 13 Mutexes left.

We travel back to city 2 and lose 4 more Mutexes. Spend 130. 9 Mutexes left

We travel to city 4 and lose another 3 Mutexes. Spend 90. 6 Mutexes left.

We finally travel to Tarasoga and spend 198. Losing everyone including Xorvier

Total spent is $600 + 160 + 130 + 90 + 198 = 1179$

Grading Information

Reading from and writing to standard input – 10 points

"Split" nodes or allows nodes to be revisited – 10 points

Do some distance algorithm – 10 points

Comments, white space usage, and reasonable variable names – 10 points

Your program will be tested on 12 test cases – 5 points each

No points will be awarded to programs that do not compile.

Only cases that finish within the maximum of {5 times my solution, 10 seconds} will be graded.