TQ Challenge

Vlad works for a company that produces and maintains EV charging stations. His job is to check the stations from a specific area each day. He also uses an electric vehicle to do this, so he needs to charge it from time to time. Not all stations have the same specifications. Some of them provide a higher charging speed than others.

Each morning, he gets a list of stations that he needs to visit. The list contains the charging speed of each station, the position, and the distance from one station to another.

Using the list, you need to help Vlad to optimize his root in order to finish his job faster.

Task:

Given a list of stations with the distance between them and the time required to charge the battery(0-100%), you need to find the order in which the stations need to be visited and the percentage that you need to charge at each station that minimizes the total traveling time.

Constrains:

-> Each station needs to be visited only once.
-> A car can not be in two places at the same time.
-> Car can not be driven with 0% battery.
-> Battery can not be charged more than 100%.

* Simplifications:

* The car moves at a constant speed between stations (v) .
* Car consumption is constant x% of the battery percentage is consumed for each km.
* The battery is charged linearly in time.

*Car specifications: x=0.02/km (0.002 of full battery capacity) ; v= 70km/h for all test submissions.

=> Input:

Station specifications:

Nondiagonal elements represent the distance between stations in km. The diagonal elements represent the time required to charge the battery from 0 to 100 fully.

100% charging time min	Station 1	Station 2	Station 3	Station 4
Station 1	60	100	200	300
Station 2	100	30	400	150
Station 3	400	400	5	50
Station 4	300	150	50	360

=>Output:

Order: [s1, s3, s4, s2]
Charge: [0.1, 0.2, 0, 0.3]
Time Cost: 428

Hint: Convert the the distance in time and battery percentage required to be covered