

Fcar

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[https://www.codechef.com/INSQ2015/problems/INSQ15\\_F](https://www.codechef.com/INSQ2015/problems/INSQ15_F)



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## FCAR

Problem Code: **INSQ15\_F**

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Cars of future no longer need fuel to run, but they are fitted with special engines which can only operate in one of the two **modes** at a time ,either go **up the road**, or go **down the road**.

There are **N** towns in country.  $i^{\text{th}}$  town is at height  $H[i]$  ( $1 \leq i \leq N$ ) above the sea level.

Changing mode of the car requires permissions from mayor of the town you are currently at. Mayor of  $i^{\text{th}}$  town charges amount  $C[i]$  ( $1 \leq i \leq n$ ) for giving permission to change mode of the car.

These **N** towns are connected by **R** bidirectional roads. Initially no mode is set, so you need permissions to set a mode.

You have to travel from town 1 to **N**, in minimum amount of cost. Print minimum money required to make the travel. If it is impossible print -1.

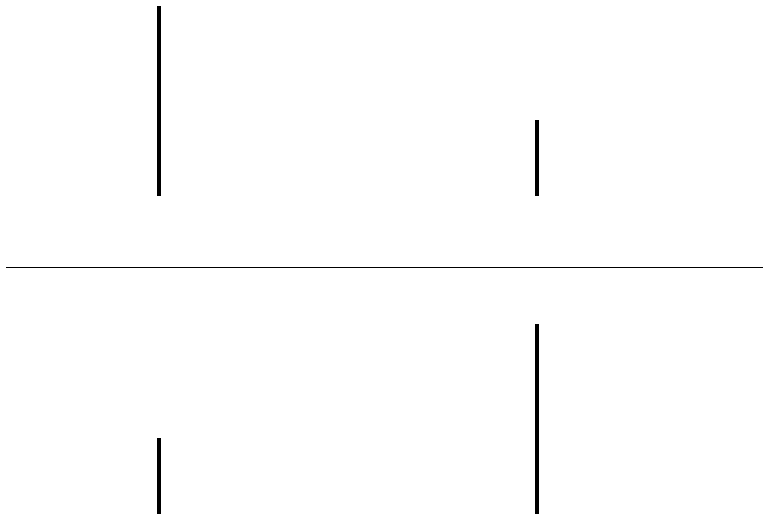
**Note:**

All Submissions

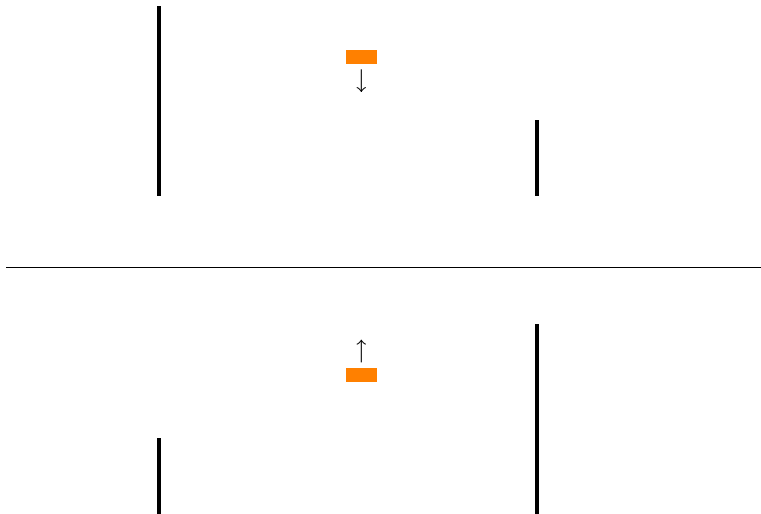
Successful Submissions



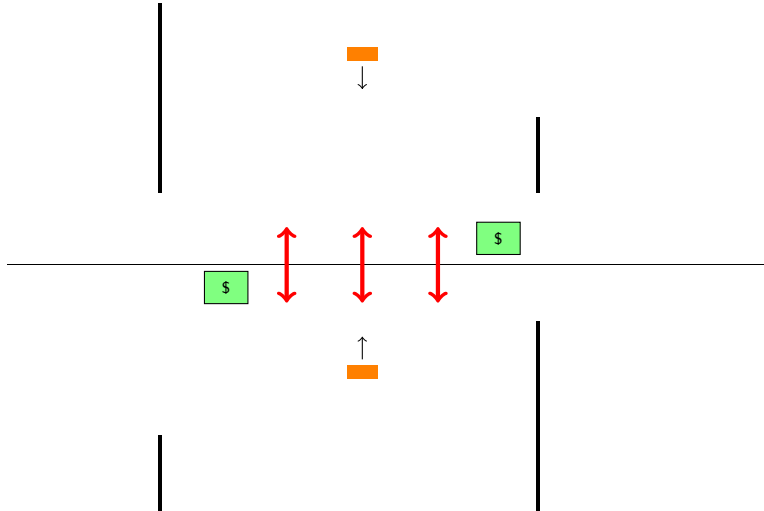
Les villes sont situées à une certaine hauteur



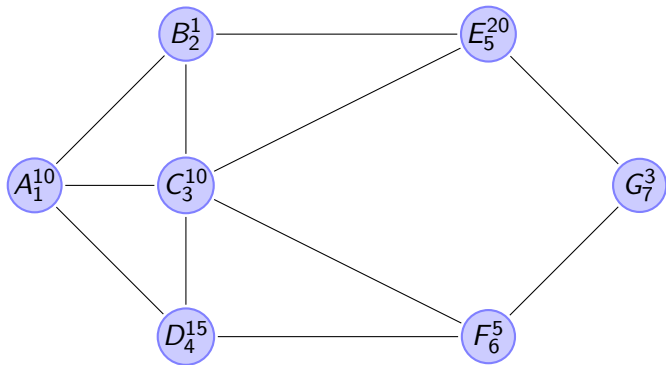
Les voitures ont deux modes. Elles montent ou descendent



Pour passer d'un mode à l'autre. Il faut payer :-)

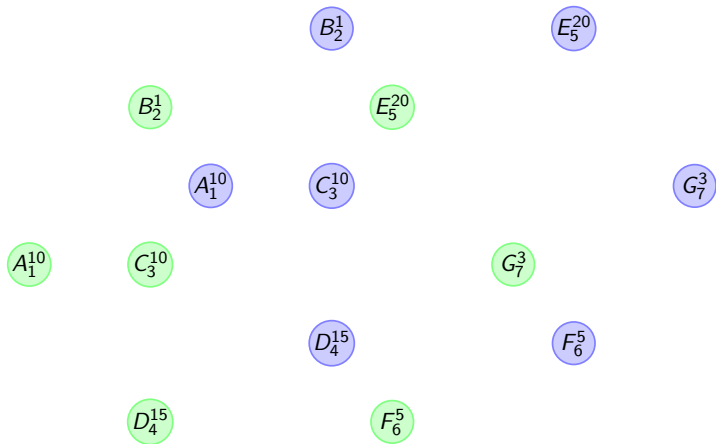


Aller de  $A$  à  $G$  (nom<sup>hauteur</sup><sub>prix</sub>)



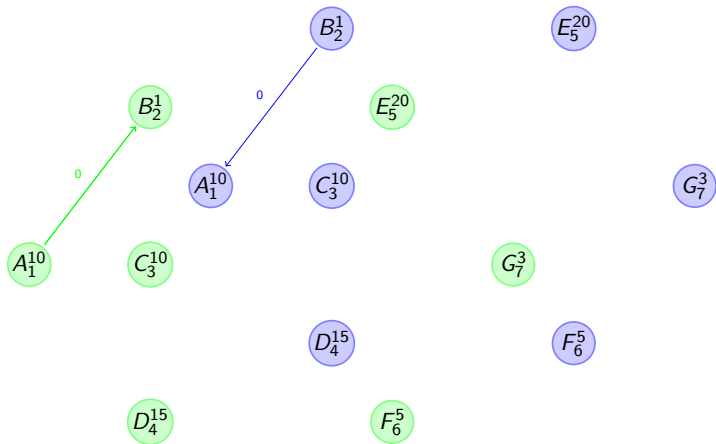
Un nouveau graphe

2 fois plus d'états

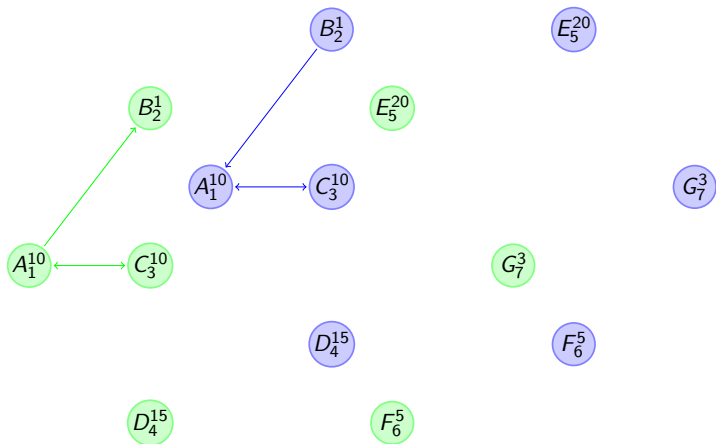




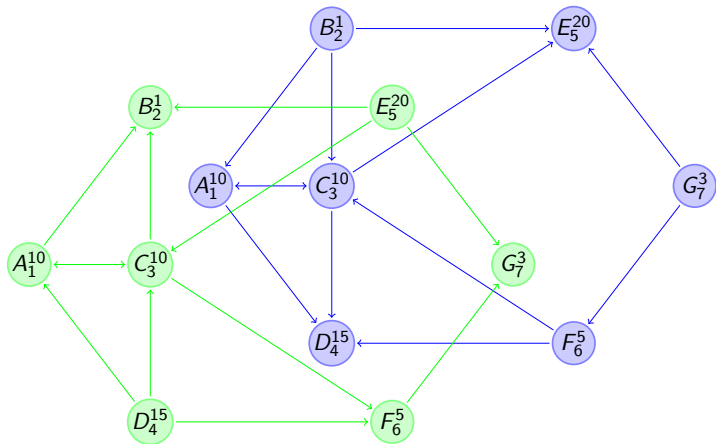
On monte en bleu. On descend en vert



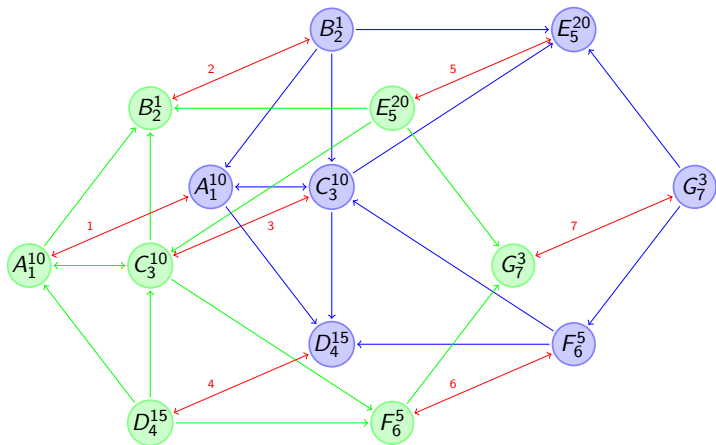
On reste à ma même hauteur en bleu ou en vert



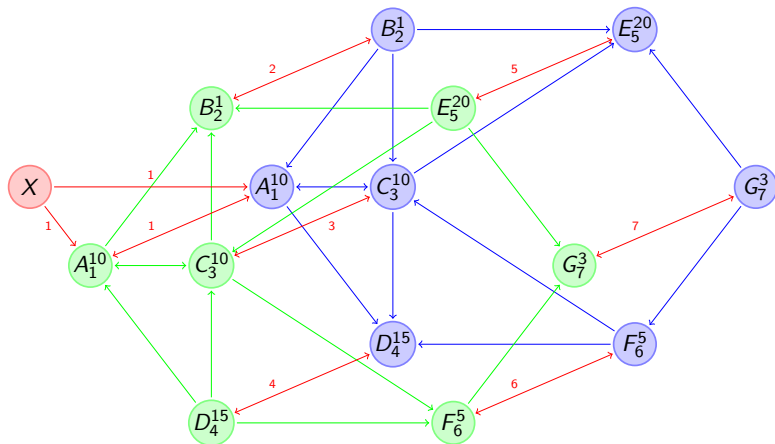
## Deux variantes du graphe original



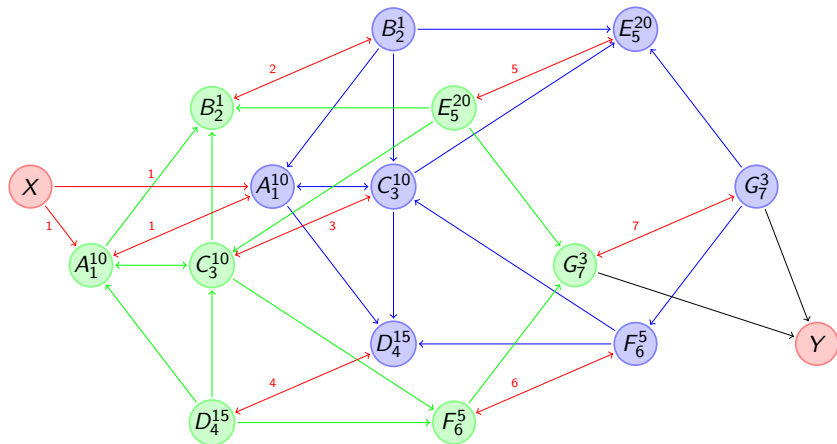
On paye en rouge



# Un nouvel état initial



## Un nouvel état but



Quel est le plus court chemin  
entre  $X$  et  $Y$  ?

# Algorithme de Dijkstra

