Lord Of The Strings

Submission Guidelines

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1 Jor-El File

The Jor-El file should contain the following functions:-

1. **init**- This function will be called to give the initial positions of each Kryptonian.It will take a 5-membered list as an argument, where each member denotes the labelling of the city each Kryptonian is present.
   Note: It is not recommended to load all the required libraries and files in this function call.

2. **move**- This function will be called to change the position of all Kryptonians.This will take a five-membered list where each member is the labelling of the city in which is a Kryptonian is currently located.This function should return a five-membered list whose each member should be the labelling of city in which the Kryptonian is present after applying the operation.

3. **info**- This function will be called to give some clues about the position of Zod's army.This will 2 arguments as input. The first argument will be a number either 0 or 1.If the first argument is 0 then the second argument will be a 3-membered list with each member being a number denoting the category[1] of operation applied by the member of Zod's army to move.Otherwise if the first argument is 1 then the second argument will be a 2-membered list,first one is a 3-membered where each member is a labelling of the city in which the member of Zod's army is currently present, and the second argument is a number denoting the index [2] of the 3-membered list given as the first argument.This exactly tells us the current position of the pod and the person carrying it.

4. **exchange**-This takes a number as a argument, which gives us a clue about the cities which were involved[3] in the exchange.If two cities say **A** and **B**

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[1]Category1: Right Shift and Left Shift
Category2: Alt Swap and Half-reverse
[2]0-indexed
[3]By involved I mean the members Of Zod's army who were involved in the exchange

,were involved in the exchange.Now the number will tell us the operation that will allow us to move from A to B by applying it on A.The table tells us the number associated with each operation.

Index	Operation
1	Right-Shift
2	Left-Shift
3	Alt-Swap
4	Half-Reverse

2 Zod's Army

1. **init**- This function will be called to give the initial positions of each member of Zod's army.It will take two arguments .First a 3-membered list as an argument, where each member denotes the labelling of the city where the member of Zod's army is currently present.The Second argument is the index of the three membered list taken as the first argument.This exactly tells us the current position of the pod and the member carrying it.
   Note: It is not recommended to load all the required libraries and files in this function call.

2. **move** - This function will be called to change the position of the Zod's army.This will take two argument.First,a three-membered list where each member is the labelling of the city in which is the member of Zod's army is currently present.The Second argument is the index of the three membered list taken as the first argument.This exactly tells us the current position of the pod and the member carrying it.
   Note:

   - Exchange can be only made at the start of Zod's turn.As in at the start of the turn, players first exchange pods, and then move.
   - Multiple exchanges are not allowed. If all the three members are in consecutive cities say A,B and C and pod is currently in city A then it can be exchanged with the member in city B but then the member in city B cannot exchange it with the member in city C in the same turn.

   This function should return a 2-membered tuple where the first member is a three-membered list whose each member should be the labelling of city in which the member of Zod's army is present after applying the operation and second member is the index of the three membered list which denotes the member of the Zod's army currently in possesion of the pod[4].

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[4]Here each member of the Zod's army can be recognised by the index of the position list(It is a list where each member of the list is the labelling of the city where a member of Zod's army is present i.e the first argument of the info function)

3. **info**- This function will be called to give the current position of Kryptonians.The info function takes only one arguments, i.e a 5-membered list in which each member denotes the labelling of the city in which the Kryptonian is present.

3 Control Flow

1. First we will initialise both the positions of Zods army and Jor-El's army by calling the respective init function. We then move to Step 2.

2. Now We will start with Jor-El's army by calling the move function, which will move the 5 kryptonians.We then move to Step3.

3. Now we will check if the Jor-El's army succeeded in catching the personal with pod by catching the member of Zod's army. If not succeeded we move to step 4.

4. Now we give the Zod's army the position of Jor-El's army by calling the info function.We then move to Step5.

5. : Now we move the Zod's army by calling move function. In this step the participants could make a legal exchange of pods.But participants have to always keep in mind that first they have to make the exchange and then move the players. Assuming the Jor-El's army play optimally we move to Step-6.

6. Now if location tracker worked then we give the Jor-El the location of Zod's army by calling the info function.And we move to Step-7

7. We move to Step-2 again

4 Important Points

1. We only support python.

2. Exchange can be only made at the start of Zod's turn.As in at the start of the turn, players first exchange pods, and then move.

3. Multiple exchanges are not allowed. If all the three members are in consecutive cities say A,B and C and pod is currently in city A then it can be exchanged with the member in city B but then the member in city B cannot exchange it with the member in city C in the same turn.

4. It is recommended that all modules and files be loaded outside the functions we are going to call.

5. The modules you have in your file will be loaded by importing you whole file.Also the file import should not more than 10s

6. Also you should not execute any script which exits the program and this will lead to your defeat.

7. The libraries you are allowed to use are:-

- Keras
- Tensor Flow
- Pytorch
- Numpy
- Scipy
- Theano

If you want any other library who have to mail us on the given email address.

5   Constraints

(a) Jor-El's file

    i. Importing the file: 20s

    ii. init : 3s

    iii. move : 1s

    iv. info : 0.9s

(b) Zod's file

    i. Importing the file: 20s

    ii. init : 3s

    iii. move : 0.6s

    iv. info : 0.5s

(c) Length Of labelling of a city : 400

(d) Number Of Moves(1 move is move of 5 kryptonians and Zod's army) : 250

(e) Number of moves after which the tracker of Krptonians work : 5