Task 3 - Rewards Simulator

Daniel is the CEO of a successful internet service provider startup and he wants to drive it to the next level. While searching innovative ways to boost sales, he came up with a smart marketing strategy: find partners to resell internet contracts and reward them every year for their sales. Soon he realized that the partners were getting lazy after some sales so he came with another idea: set multiple levels based on the number of sales. But the partners were still getting lazy so he decided to allow them to register subpartners and get rewards based on the sales of the subpartners. Finally the partners were happy and eager to make more and more sales. But now they wanted to know their rewards every quarter. Help Daniel find out how much each partner is earning each quarter.

The company sells 2 types of internet contracts:

- **Tortoise**: 100 Euro per year
- **Rabbit**: 300 Euro per year

The partner levels and their rewards are:

- **Ant**: initial level., starting from 1st contract, 5 Euros annually per contract
- **Bee**: from 10 contracts, 7 Euros annually per contract
- **Cat**: from 50 contracts, 9 Euros annually per contract
- **Dog**: from 200 contracts, 12 Euros annually per contract
- **Elephant**: from 1000 contracts, 19 Euros annually per contract

The rewarding rules are the following:

- partner level is based on the sum of contracts sold by the partner and all subpartners
- partner level is upgraded or downgraded automatically when the number of contracts reaches or goes below the threshold levels.
- the reward is paid annually up to 8 years in the quarter when the sale was made. For example, if a sale was made in Q3 2015, the corresponding rewards would be paid in Q3 2015, 2016, 2017...
- after 8 yearly rewards, the contract is no longer rewarded and is no longer included in the partner level computation (levels might be downgraded as a consequence)
- sales of **Rabbit** contracts are additionally rewarded by a one time bonus of 50 Euros, no matter the partner level and is only paid to the partner who made the contract.
- reward differences are paid to parent partners. Consider the following example: Partner A (Ant) , Partner B (parent of A, Level Bee), Partner C (parent of B, Level Dog). For every direct contract sold by A, B gets a difference of 2 Euros while C gets a difference of 5 Euros (from Bee to Dog)

Given the specification above, your task is to design and implement a rewards simulator with the following features implemented with standard input commands:

- **REGISTER partnerId –** registers partner identified by partnerId in the system. Example “REGISTER 1”
- **REGISTER partnerId parentPartnerId –** registers partner identified by partnerId to parent partner identified by parentPartnerId. Example “REGISTER 2 1”
- **LOAD filename –** load sales report where filename represents a CSV document where each line is composed of 5 values in following order:
  - partnerId – type long, existing partner in the system
  - contractId – type long, unique contract id

    - contractType – type string, possible values: **Tortoise** or **Rabbit**
    - date – type string representing a date in format YYYY-MM-DD
    - action – type string, possible values: **BEGIN** or **END**
- **LEVEL partnerId year quarter –** list partner level for a given quarter. Example “LEVEL 1 2015 1”. Expected output is a string having one of the values: **Ant , Bee , Cat , Dog** or **Elephant** .
- **REWARDS partnerId year quarter –** list expected rewards for a given quarter. Example: “REWARDS 1 2015 1” . Expected output is a number representing the value of the reward.
- **ALL_REWARDS partnerId –** list all rewards one quarter per line . Example “REWARDS 1”. Expected output is a list of lines of format “year quarter rewards” where year is a number, quarter is a number in range 1-4 and rewards is a number

All interaction shall be with standard input/output.