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## Task

There is a planet, where different kind of plants are living. All the plants are using nutrients to live. If a plant runs out of its nutrients, it dies. Each day one radiation type can occur from the followings: alpha, delta, or no radiation. Radiations affect the plants differently based on their types. The reaction of a plant to a given radiation consists of the following: it changes its nutrient level, and affects the radiation of the next day. The radiation of the next day:

a. alpha, if the need for alpha radiation is 3 or more greater than for the delta radiation
b. delta, if the need for delta radiation is 3 or more greater than for the alpha radiation
c. no radiation, otherwise

There is no radiation on the first day…

***Simulate the behaviors of the plants, and print out the radiation of the day and the properties of the plants on each day.***

Properties of the plants: name (string), nutrients (integer), living (boolean). The types of the plants in the simulation: puffs, deltatree, parabush.
On a day of the the simulation the living plant first changes its nutrients, then if it is still alive, it can affect the radiation of the next day.

| | nutrients (N) | | | radiation need on next day | | | dies |
|---|---|---|---|---|---|---|---|
| | alpha | delta | no radiation | alpha | delta | no radiation | |
| Puffs | +2 | -2 | -1 | 10-N | | | 10<N |
| Deltatree | -3 | +4 | -1 | | +4, if N < 5<br>+1, if 5 ≤ N ≤ 10 | | |
| Parabush | +1 | +1 | -1 | | | | |

Read the data of the simulation from a text file. The first line contains the number (n) of the plants. The following n lines contain the information about the plants: name, type, initial nutrient level. Type is represented by one character: p - Puffs, d - Deltratree, b - Parabush. The last line of the file defines the number of the days you have to simulate.
The program should ask for the name of the file, and it has to print out the name of the survivors (we can assume that the file is existing and its format is valid).

A possible file content:

```
4
Piggy p 7
Slender d 5
Dumpy b 4
Willowy d 3
10
```

## Analysis[1]

The radiations affects the plants in a following way:

Puffs :

| Radiations | nutrient change(N) | Radiation need next day |
|---|---|---|
| alpha | +2 | 10 - N |
| delta | -2 | - |
| No radiation | -1 | - |

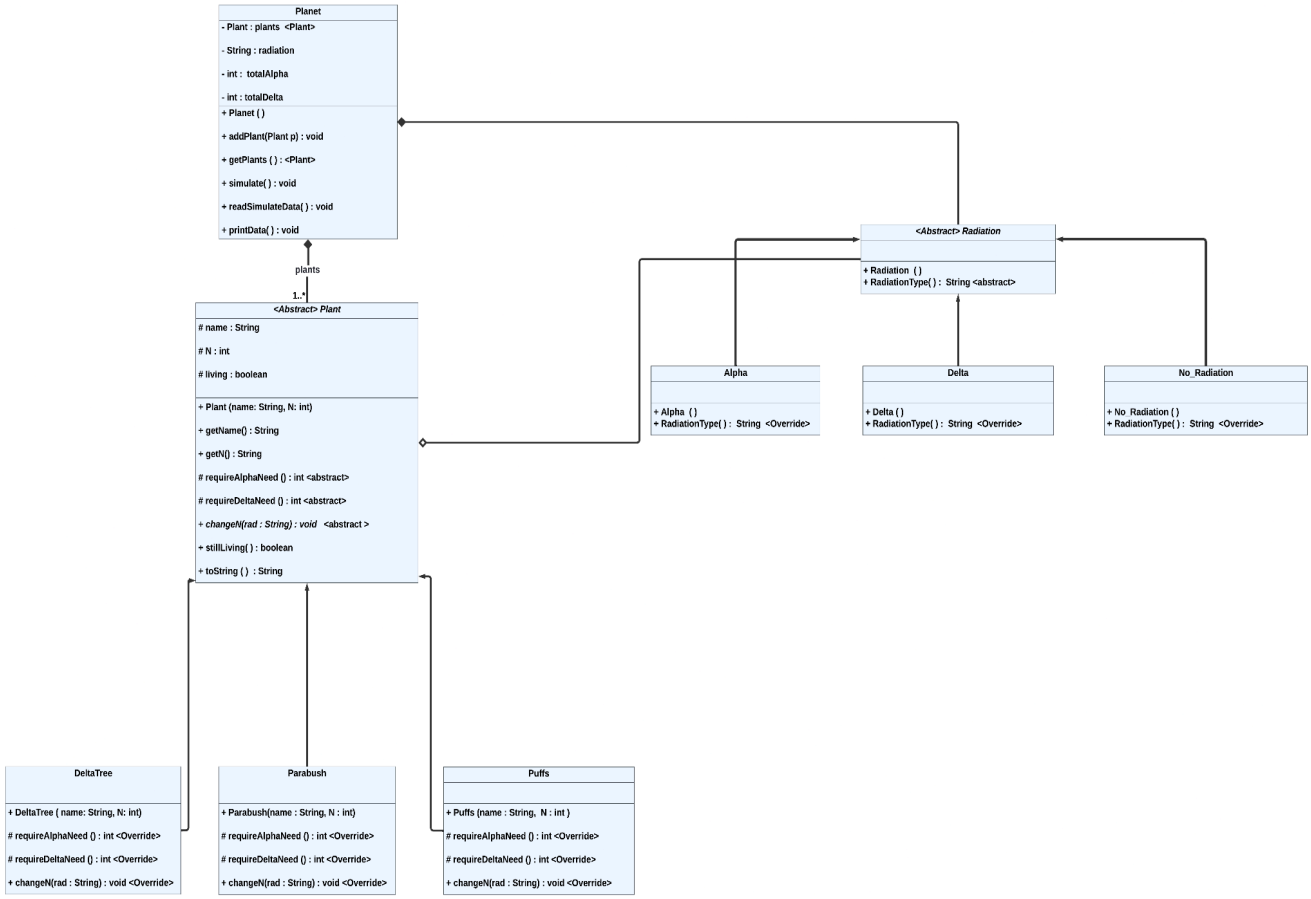
DeltaTree :

| Radiations | nutrient change(N) | Radiation need next day |
|---|---|---|
| alpha | - 3 | - |
| delta | +4 | +4 if $N < 5$<br>+1 if $5 \leq N \leq 10$ |
| No radiation | -1 | - |

Parabush :

| Radiations | nutrient change(N) | Radiation need next day |
|---|---|---|
| alpha | +1 | - |
| delta | +1 | - |
| No radiation | -1 | - |

## UML Diagram[2] :




## Testing[3]

All are Final outputs of Last Day:

- (1.txt) When there is only One Plant Puff Type Output is:
    - Plant name: Piggy, N: 9, Living: true

- (2.txt) When there is only one Plant DeltaTree Type Output
    - Plant name: Willowy, N: 6, Living: true

- (8.txt) When there is only one Plant Parabush Type Output:

    - Plant name: Dumpy, N: 2, Living: true

- (3.txt) When there are Plants but there is no survivor left Output is:
    - No survivor plants.

- (4.txt) When there are zero number of days then No-Simulation:
    - Plant name: Piggy, N: 4, Living: true
    - Plant name: Dumpy, N: 1, Living: true
    - Plant name: Willowy, N: 2, Living: true

- (6.txt) Only DeltaTree type Plant Left:
    - Plant name: Slender, N: 7, Living: true
    - Plant name: Willowy, N: 10, Living: true

- (7.txt) Sample Input, Output is:
    - Plant name: Piggy, N: 4, Living: true
    - Plant name: Dumpy, N: 4, Living: true