**Challenge proposal algorithm**

This algorithm is intended to suggest habits that are commonly used by the community and that are comparable to the current user. This helps newcomers or those who have long participated in good habits or give up bad habits to improve themselves.

Supposed:

- d1 is time that users join the app from 1-3 months.

- d2 is time that users join the app from 3 months – 1 year.

- d3 is time that users join the app more than 1 year.

Supposed

- j: is the date of joining the app

- t: is the current date

Then

d1 = t – j <= 90

d2 = t – j = [90,365]

d3 = t – j > 365

----------------------------------------------

Based on a habit:

Supposed:

a: is the number of days (for the habit which type is daily), the number of weeks (for the habit which type is weekly), the number of months (for the habit which type is monthly), the number of years (for the habit which type is yearly)

b: is the total number of days (for the habit which type is daily), the total number of weeks (for the habit which type is weekly), the total number of months (for the habit which type is monthly), the total number of years (for the habit which type is yearly).

* The total number of days is given by “the current time” - “the time that the habit starts” and more than 1.
* Similar to the total number of weeks, months, and years

Supposed:

p: The habit is done successfully.

p = a / b with a / b >= 0.8

f: The habit is unsuccessful

f = a / b with a / b < 0.8

Supposed

h: is the difficulty of the habit

k1: is successful habits

k2: is unsuccessful habits

h >= 0.8 -> Easy habit

0.5 < h < 0.8 -> Average habit

h < 0.5 -> Difficult habit

The system will then recommend based on

For d1 -> easy habit

For d2 -> average habit

For d3 -> difficult habit

Let x (n) be the used habit of many people, \* (x1 most users use it, x2 many users use it after x1, ….)

Then:

For example, 10 users use a habit "gym"

User1: Habit "Gym" has a daily type

Start date is 10/10/2018

Current date is 20/10/2018

Day of implementation is 10 days, of which 8 days is successfully completed, 2 days is failure.

* a / b = 0.8 => implementation of the habit is (Pass)

User2: Habit "gym" type yes / no

Start date is 1/10/2018

Current date 15/10/2018

The implementation date is 15 days, of which 9 days are yes, 6 days are no.

a / b = 0.6 => implementation of the is (Fail)

Assumptions:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | User 1 | User 2 | User 3 | User 4 | User 5 | User 6 | User 7 | User 8 | User 9 | User 10 |
|  | Pass | Fail | Pass | Pass | Fail | Pass | Pass | Pass | Pass | Pass |
| Habit | gym | gym | gym | gym | gym | gym | gym | gym | gym | gym |

8: Pass

2: Fail

* h >= 0.8 -> easy habit

So for the user A with the participate time is 2 month = > apply d1

Assume the following top habit:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Habit  (top1) | Habit  (top2) | Habit  (top3) | Habit (top4) | Habit  (top5) |
| Times of using | 553 | 500 | 465 | 326 | 254 |
| Difficulty of habit | Difficult | Average | Difficult | Easy | Difficult |

* User A will be suggested for habit number 4