**Linear programming algorithm**

This algorithm is used to suggest habits that are commonly used by the community and have the same level of performance as the current user. This helps newcomers or those who have long participated in good habits or abandoned bad habits to improve themselves.

|  |
| --- |
|  |

Based on user criteria, we have the following general formula:

With:  
t: is the same display characters are sorted in decreasing turn by user.

d: is the difficulty of the habit

c: is the level of users

Based on user criteria, we have the following level of user-formula:

Supposed

C1 is the total tracking of times the user's habit <30 times.

C2 is the total tracking of the habit from 30 to 60 times of the user.

C3 is the total tracking of the habit from> 60 times of the user.

Based on a habit, we have the following difficulty of the habit-formula:

We have:

a: is the number of successful tracking of the habit

b: is the total tracking of the habit ( success or failure)

Supposed

p: The habit is done successfully

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

f: The habit is done unsuccessfully

f = a / b with a / b < 0.8

Supposed

h: is the difficulty of the habit

k1: The habit is done successfully

k2: The habit is done unsuccessfully

d1: easy habit

d2: medium habit

d3: difficult habit

We have:

Difficulty of the habit =

⬄

If

h >= 0.8 -> d1: easy habit

0.5 < h < 0.8 -> d2: medium habit

h < 0.5 -> d3: difficult habit

Then we will recommend for user as below:

For c1, the easy habit is suggested

For c2, the medium habit is suggested

For c3, the difficult habit is suggested

x (n) is a widely used habit, ∀n ∈ N \* (x1 most users, x2 many second ...)

Based on the difficulty of the habit-formula and level of user-formula we have the following formula:

If c1 will be applied:

If c2 will be applied:

If c3 will be applied:

For example, 10 users use a habit "gym"

User1: Habit "Gym" has a daily type

Start date: 10/10/2018

Current day: 20/10/2018

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

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

User2: Habit “tập gym” has a yes/no type

Start date: 1/10/2018

Current day: 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 failure habit (Fail)

Supposed:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 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

Example user A has done 2 habits with a tracking number is 15 => applies d1

Assume the following top habit

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Habit 1 (top1) | Habit 2 (top2) | Habit 3 (top3) | Habit 4(top4) | Habit5(top5) |
| Uses | 553 | 500 | 465 | 326 | 254 |
| Difficulty of the habit | Difficult | Medium | Difficult | Easy | Difficult |

User A will be offered Habit 4

