SDG & Recommendations Calculations Overview

Finappster Sigma

My Values SDG calculation

As of now, our team decided that the simplest way to retrieve a user's SDG values is to rank all 17 SDGs themselves. In the live app, this is done by allowing the users to drag in each sdg in a container where they are free to rank them in any order.

When the user is done ranking them, each SDG is given a value based on its position in the list. E.g An SDG positioned first will be given 17/17 which is 100% whereas an SDG positioning last will get 1/17 which is 5.88% and so on. After each SDG value has been calculated, each SDG will be put into its corresponding 'P' category to calculate the overall 5Ps.

5p Calculation Formula

As the SDG's are categorised under the following 'P' values:

People:

- No Poverty
- Zero Hunger
- Good Health and Wellbeing
- Quality Education
- Gender Equality

Planet:

- Clean Water and Sanitation
- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life on Land

Prosperity:

- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequalities
- Sustainable Cities and Communities

Peace:

- Peace, Justice and Strong Institutions

Partnerships:

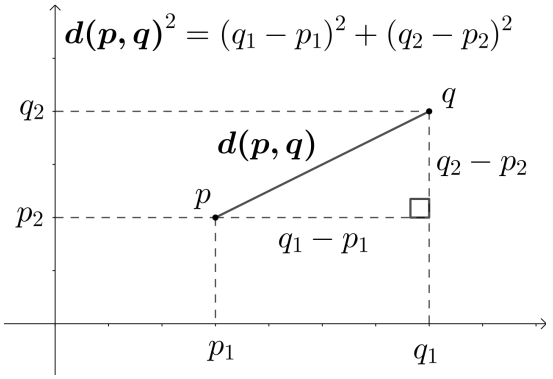
- Partnerships for the Goals

The most appropriate and simplest solution to how our team solved calculating the overall 'P' value for a user is to aggregate each SDG every value within each 'P' category and solve for its average. An example for solving the value 'People' can be seen below

$$People = \frac{(NPov + ZHunger + GHWellbeing + QEducation + GEquality)}{5}$$

Share & Fund Recommendation Algorithm

To find the best recommended share or fund for the users values, our team concluded that using the Euclidean distance formula would best fit this situation. This is a formula based on the Pythagorean theorem to compute the distance between two vectors. Our team also decided that comparing each share/fund to a user's values must be done with the 5 P's rather than all 17 SDGs as there would be significantly less calculation done when comparing a list of shares/funds.



The diagram above can be simplified further to only find the the distance between p to q effectively giving us a formula where we only need the coordinates of two points. This is given by:

$$d(p,q) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2}$$

In the case of implementing this to the Finappster recommendation system, we must account for a higher dimension as each 'P' value can be represented as a point in the Euclidean plane. This way, with the n-dimensional Euclidean distance formula, we can derive the distance between two 5 P values by repeatedly applying the Pythagorean Theorem.

$$d(p,q) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \ldots + (p_i - q_i)^2 \ldots + (p_n - q_n)^2}$$

The current implementation of this inside the Finappster codebase uses a Divide and Conquer algorithm where as we fetch a list of all the shares or funds from within the database, this formula is being applied to allow us to sort it from most relevant to the least. The relevancy is determined by whichever number from the output is the smallest as two similarly valued shares/fund and user values must be located near each other in the Euclidean plane.

This algorithm is given through the following:
With p = user values and q = share values, each of the 5 P values from the user and shares will be represented as a point from within a Euclidean plane.

$$d(p,q) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + (p_3 - q_3)^2 + (p_4 - q_4)^2 + (p_5 - q_5)^2}$$

This formula will give us the overall distance between the two points which would represent how relevant or similar both values are. This formula will then be repeatedly applied to the rest of the shares from within the database to give us a list of the distances (relevancy) to the users values. As we retrieve the distances for each share, we then use this to sort out each share from the smallest number to the most which then, effectively sorts our list from most relevant to the least.