Introduction of the problem

Our work is about trying to change the function that the bot based on to determine the target planet which called **Score function**.

$$Score(p) = \frac{p.NumStarships.w_{NS-DIS}.Dist(base, p)}{1 + p.GrowthRate.w_{GR}} \quad (1)$$

Where the w_{NS-dis} and the w_{GR} are weights related successively to starships number, the growth rate for the planet and the distance to reach the target. the $base$ is the planet which has the highest number of starships and p refer to planet want to evaluate.

On the other hand, this function tries to make a relation between those weights in order to define which planet will be targeted. Also, as we know that the values of w_{ns}, w_{Dis}, and w_{gr} are in the range of [0,1] and will be multiplicated with the real values of the target P. The planet with the high score will be selected.

we will use fuzzy logic as follow :

1. The parameters included are :
   - w_{NS} the starship number probability and not the starship number of the target p itself.
   - w_{DIS} the distance probability and not the real distance itself.
   - w_{GR} the growth rate probability and not the growth rate of the target p itself.
2. All those parameters are in rage of [0,1].
3. Using the following generale membership functions :

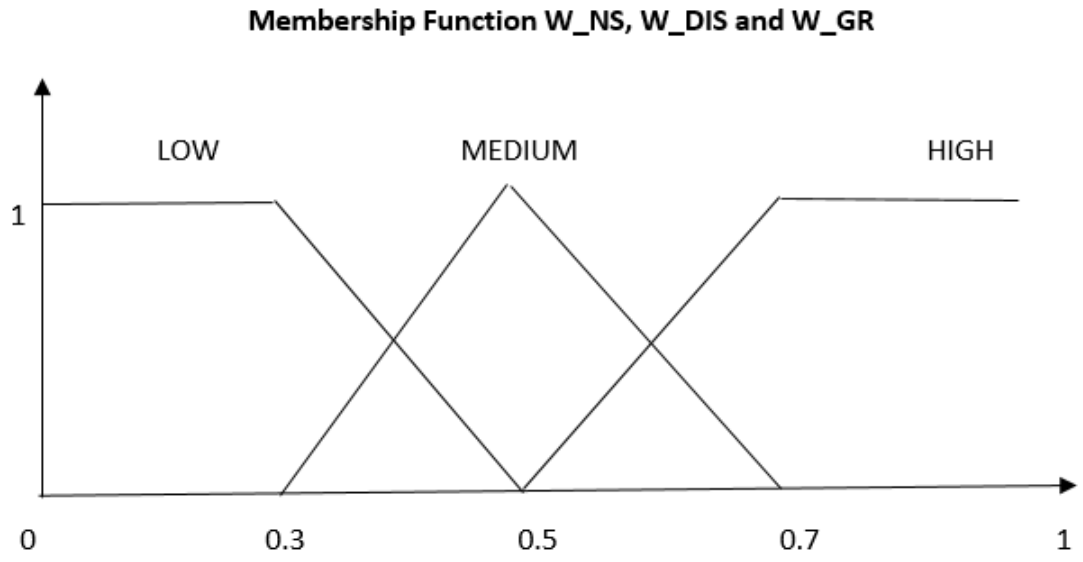

Figure 1 – Membership Function using for all parameters