

Soft Computing Techniques Assignment 1

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Q) Design a Fuzzy Logic based decision making system

→ I) Topic: Determining Appraisal amount of Employee.

II) Input & Description:

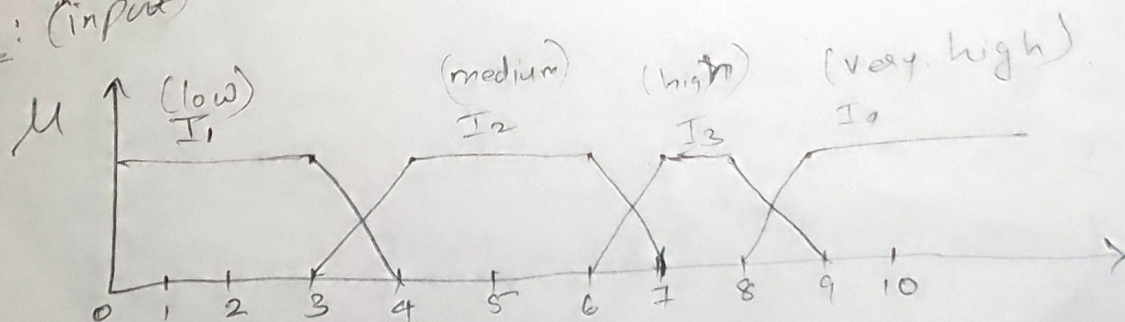
- ① Inflation (I₁): As the cost of living increases employees expect more salary. So it becomes challenging to retain them. (0-10%)
- ② Performance (P): Employees individual performance is also a factor to consider while determining hike in salary. (1-10)
- ③ Tech/Domain Skills (DS): An employees domain knowledge is also an important factor. As ~~the~~ new innovation takes place, it is important that an employee upskills himself and upgrades his skills. (1-10)
- ④ Managerial Skills (M.S): Apart from domain knowledge. It is equally important to check managerial skills of an employee. (1-10)
- ⑤ Character (C): An employees character. His interaction with his peers and his acceptance among his peers is also an important factor (1-10)

III) Output & Description:

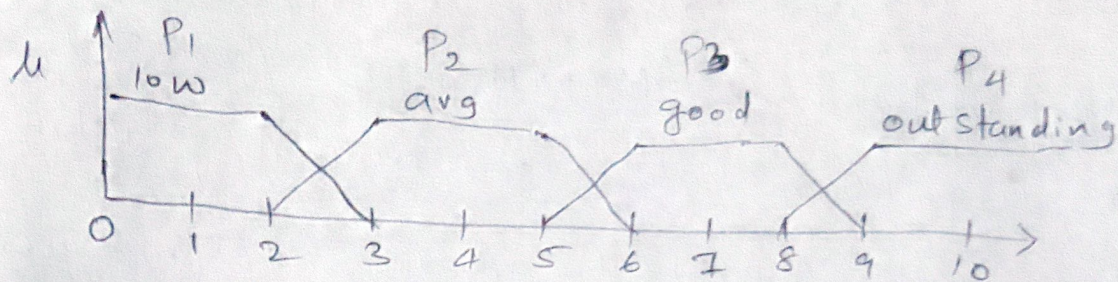
- ① Salary Hike (SH) (%): After considering all the above factors we can determine how much hike can be given to the employee. (1-100%)

IV) Membership functions for above variables can be shown as:

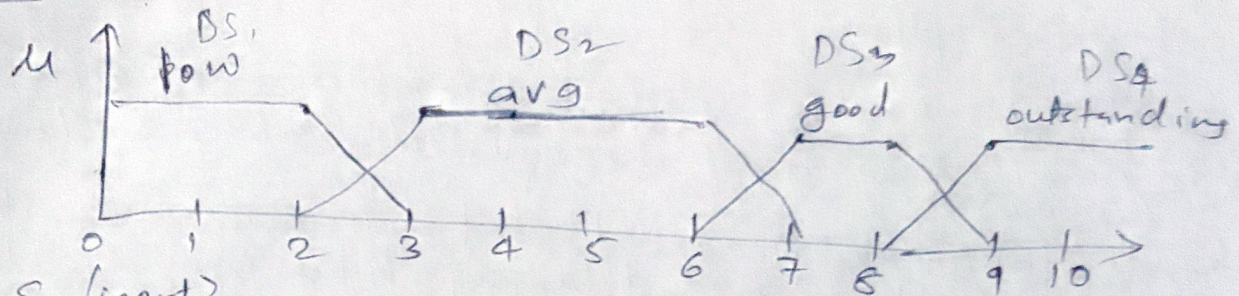
① I: (input)



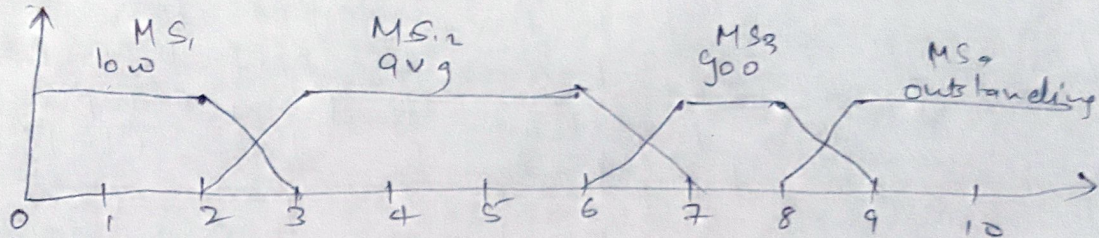
② P : (input)



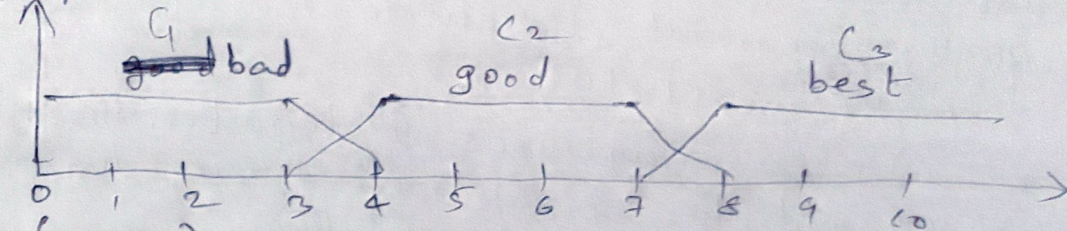
③ DS : (input)



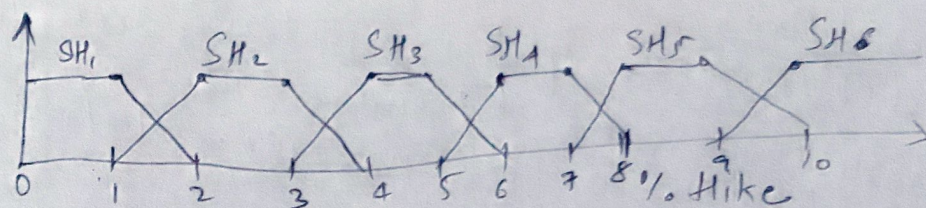
④ MS : (input)



⑤ C : (input)



⑥ SH (output):



Ⅷ) Fuzzy Rules: ~~used~~ &

- 1) If I is I_1 and C is C_1 then SH is SH_1 .
- 2) If I is I_1 and DS is DS_2 then SH is SH_3 .
- 3) If I is I_2 and DS is DS_2 then SH is SH_2 .
- 4) If I is I_3 and MS is MS_3 then SH is SH_4 .
- 5) If I is I_4 and MS is MS_1 then SH is SH_2 .
- 6) If DS is DS_4 and MS is MS_4 then SH is SH_2 .

- 7) If P is P_4 and DS is DS_4 then SH is SH_6 .
- 8) If P is P_4 and MS is MS_4 then SH is SH_6 .
- 9) If C is C_2 and DS is DS_4 then SH is SH_6 .
- 10) If C is C_3 and DS is DS_3 then SH is SH_5 .
- 11) If C is C_1 and DS is DS_1 then SH is SH_1 .
- 12) If MS is MS_2 and DS is DS_2 then SH is SH_3 .
- 13) If P is P_3 and C is C_3 then SH is SH_5 .
- 14) If I is I_4 and MS is MS_4 then SH is SH_4 .
- 15) If MS is MS_4 and C is C_2 then SH is SH_4 .
- 16) If DS is DS_4 and C is C_2 then SH is SH_4 .
- 17) If DS is DS_2 and MS is MS_2 then SH is SH_3 .
- 18) If P is P_3 and DS is DS_3 then SH is SH_4 .
- 19) If P is P_3 and MS is MS_3 then SH is SH_4 .
- 20) If P is P_1 and C is C_1 then SH is SH_7 .

VI) Examples

1) What will be the hike percentage when Inflation is high and Management Skill is good.

Solⁿ

Here Inflation is high is represented by I_3 and Management Skill is represented by M_3 .

∴ We can apply Rule no. ④.

∴ Salary hike will be SH_4 .

2) What will be hike for employee with outstanding tech skills and also good character.

Soln:

Here we can apply rule for

\therefore Salary Hike will be 5%.