

Lab 7 (15.10.2016)

There is Gaussian membership function of very small, small, medium, large and very large:

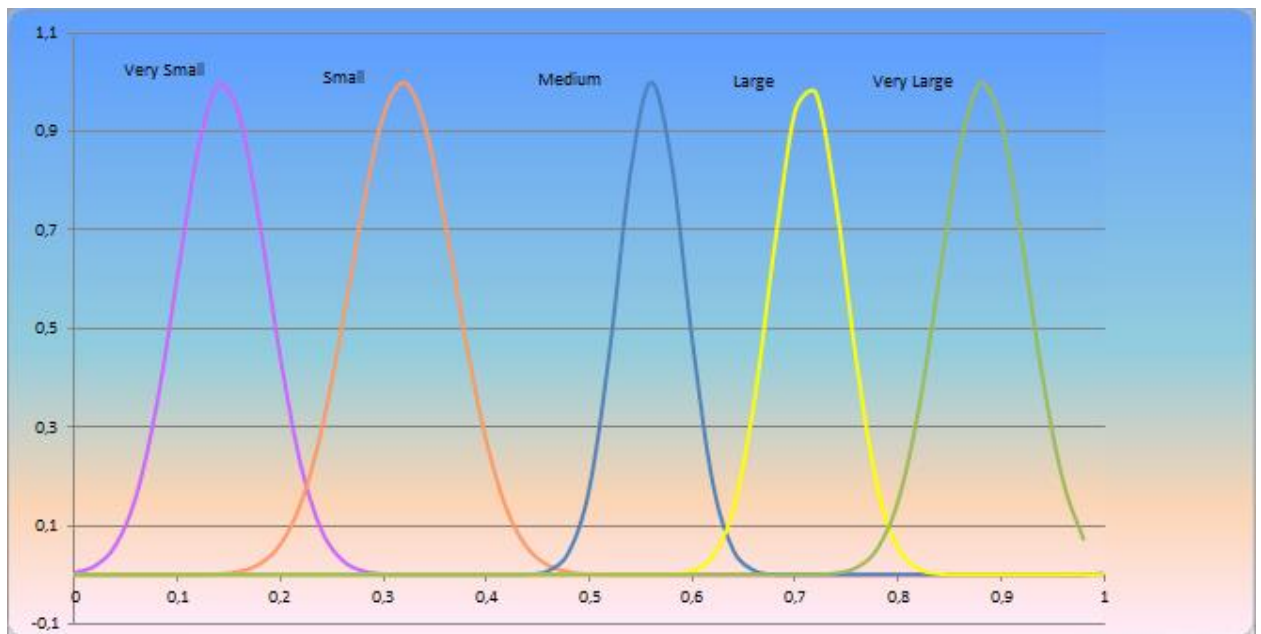
- Gaussian membership function of very small is $e^{\frac{-(x-0.143667)^2}{0.00385}}$;

- Gaussian membership function of small is $e^{\frac{-(x-0.31857)^2}{0.005069}}$;

- Gaussian membership function of medium is $e^{\frac{-(x-0.560488)^2}{0.002102}}$;

- Gaussian membership function of large is $e^{\frac{-(x-0.712558)^2}{0.002626}}$;

- Gaussian membership function of very large is $e^{\frac{-(x-0.88275)^2}{0.003615}}$



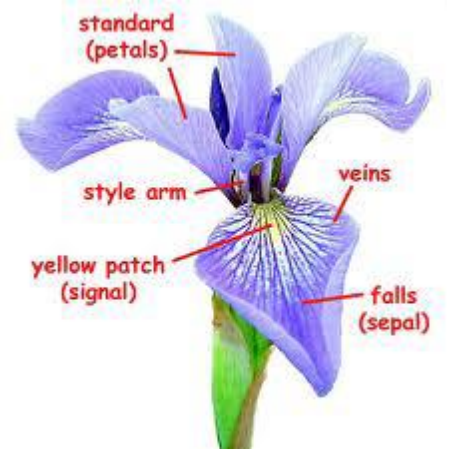
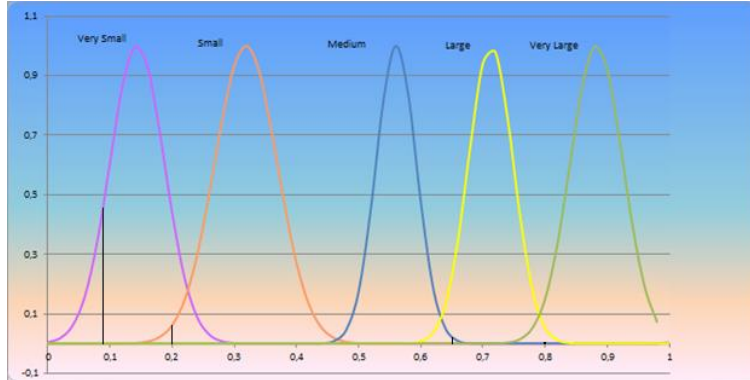
Then I created 3 rules:

1. IF X1=**medium** AND X2=**medium** AND X3=**small** AND X4=**very small** THEN A
2. IF X1=**very large** AND X2=**large** AND X3=**medium** AND X4=**medium** THEN B
3. IF X1=**very large** AND X2=**medium** AND X3= **very large** AND X4= **large** THEN C

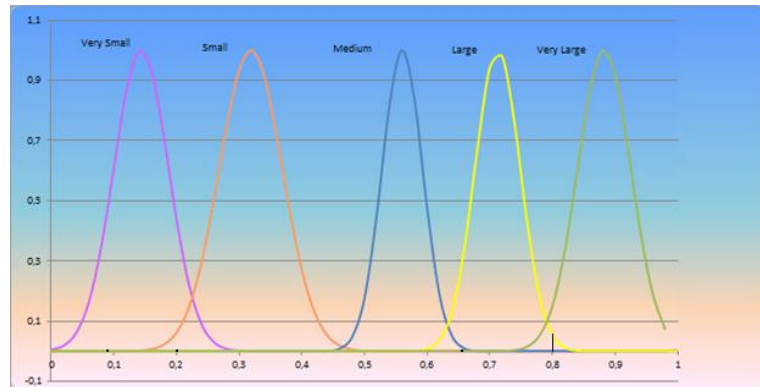
$$x1=0.65 \quad x2=0.8 \quad x3=0.2 \quad x4=0.08$$

1) IF $X1$ =medium AND $X2$ =medium AND $X3$ =small AND $X4$ =very small THEN $y=1$

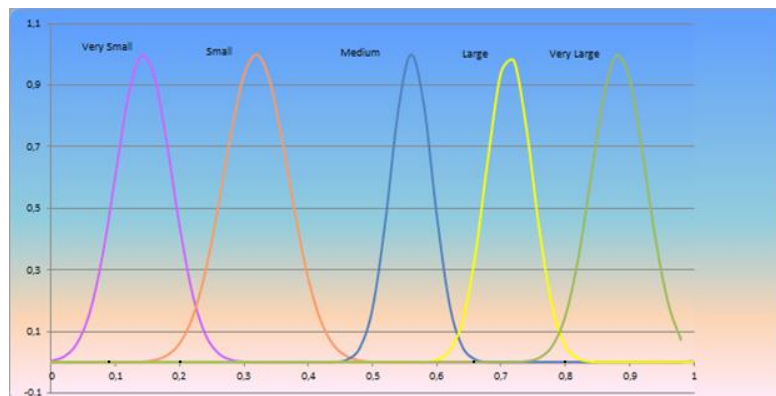
$$M1 = 0.0221 * 1.404766e-12 * 0.06244 * 0.34894 = 6.766733e-16$$



2) IF $X1$ = very large AND $X2$ =large AND $X3$ =medium AND $X4$ =medium THEN $y=2$
 $M2 = 3.103719e-7 * 0.026317 * 1.4147644e-27 * 1.9961142e-48 = 2.30669179e-83$



3) IF $X1$ =very large AND $X2$ =medium AND $X3$ = very large AND $X4$ = large THEN $y=3$
 $M3 = 3.103719e-7 * 1.40476596e-12 * 9.9662086e-57 * 2.133873459e-83 = 9.2722483e-158$



$$Y = \frac{6.766733e-16 * 1 + 2.30669179e-83 * 2 + 9.2722483e-158 * 3}{6.766733e-16 + 2.30669179e-83 + 9.2722489e-158} = 1$$