Contemporary Data Processing Technology (CCOD)
Lab 7 (October 13, 2016)
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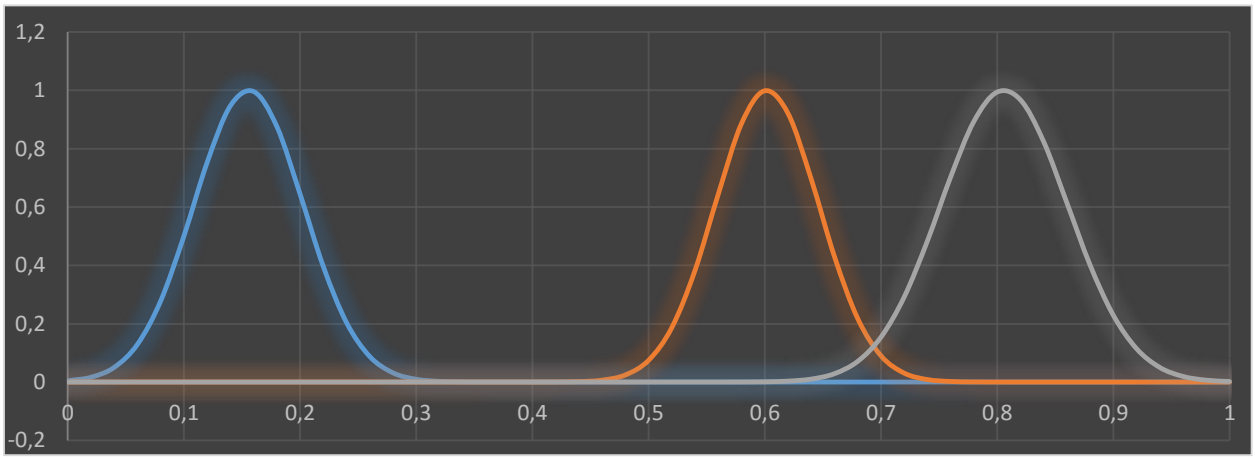
Membership Function (Gaussian):



Rules for each family:

Rule 1: If x1=medium; x2=large; x3=small; x4=small, then Family **A**.

Rule 2: If x1=large; x2=medium;x3=medium;x4=medium, then Family **B**.

Rule 3: If x1=large; x2=medium; x3=medium; x4=large, then Family **C**.

Evaluate rules:

Data №:	Family A	Family B	Family C	Result:
№ 1	A	B	C	Good
№ 2	A	B	C	Good
№ 3	A	B	C	Good
№ 4	A	B	C	Good
№ 5	A	B	C	Good
№ 6	A	B	C	Good
№ 7	A	B	B	Not good
№ 8	A	B	C	Good
Success Rate:	100%	100%	87.5%	87.5%

Flower database:

I chose 10 line.

A (Setosa)				B (Versicolor)				C (Virginica)			
X1	X2	X3	X4	X1	X2	X3	X4	X1	X2	X3	X4
0.65	0.80	0.20	0.12	0.73	0.61	0.59	0.40	0.97	0.86	0.97	0.88

To calculate rules to classify I chose A (Setosa):

X1=0.65

X2=0.80

X3=0.20

X4=0.12

Rules:	Mu1	Mu2	Mu3	Mu4
Rule 1	0.561	0.994	0.643	0.753
Rule 2	0.017	0.000	0.000	0.000
Rule 3	0.017	0.000	0.000	0.000

All results was rounded to 3 decimal plases.

M=Mu1*Mu2*Mu3*Mu4

Rules:	M
Rule 1	0.359
Rule 2	0
Rule 3	0

$$y = \begin{cases} 1 \ldots \text{if } \hat{y} < 1.5 \\ 2 \ldots \text{if } 1.5 <= \hat{y} < 2.5 \\ 3 \ldots \text{if } 2.5 <= \hat{y} \end{cases}$$

$$y = \frac{1 * \mathrm{M1} + 2 * \mathrm{M2} + 3 * \mathrm{M3}}{\mathrm{M1} + \mathrm{M2} + \mathrm{M3}} = \frac{1 * 0.359 + 2 * 0 + 3 * 0}{0.359 + 0 + 0} = 1$$

This means that the flower belongs to the family A (Setosa).

This proves that our calculations are correct.