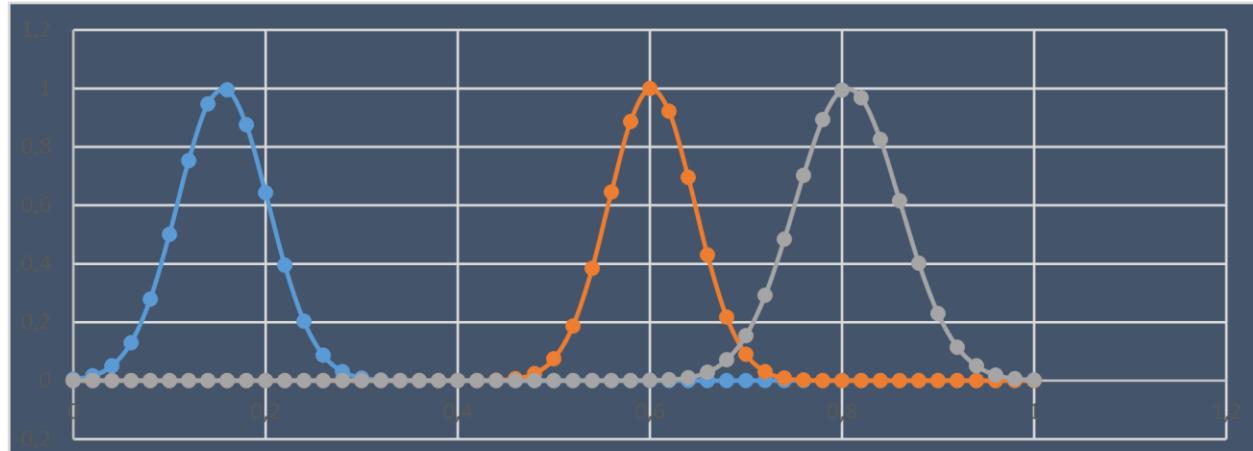


Contemporary Data Processing Technology(CCOT)

Task 7

(October 14, 2016) Timohin Valentine, AS-36

Membership Function (Gaussian):



Rules for each family:

Rule 1: If $x_1=\text{medium}$; $x_2=\text{large}$; $x_3=\text{small}$; $x_4=\text{medium}$, then Family A.

Rule 2: If $x_1=\text{large}$; $x_2=\text{large}$; $x_3=\text{medium}$; $x_4=\text{medium}$, then Family B.

Rule 3: If $x_1=\text{large}$; $x_2=\text{large}$; $x_3=\text{large}$; $x_4=\text{large}$, 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 Data:



Setosa(A)				Versicolor(B)				Virginica(C)			
X1	X2	X3	X4	X1	X2	X3	X4	X1	X2	X3	X4
0.68	0.89	0.25	0.16	0.72	0.64	0.65	0.52	0.96	0.68	0.96	0.84

For example take Versicolor (B):

Versicolor(B)			
X1	X2	X3	X4
0.72	0.64	0.65	0.52

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

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

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

Than Find μ for 3 rules:

Rules:	$\mu 1$	$\mu 2$	$\mu 3$	$\mu 4$
Nº1	0.03	0.01	0.00	0.17
Nº2	0.29	0.01	0.56	0.19
Nº3	0.29	0.01	0.02	0.00

Now calculate M:

$$M = \mu 1 * \mu 2 * \mu 3 * \mu 4;$$

Rules:	M
Nº1	0
Nº2	0.00031
Nº3	0

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

And finaly calculate Y:

$$y = \frac{1*M1 + 2*M2 + 3*M3}{M1 + M2 + M3} = \frac{1*0 + 2*0.00031 + 3*0}{0 + 0.00031 + 0} = 2$$

$$y = 2$$

So we check that flower really belongs to Versicolor family.