

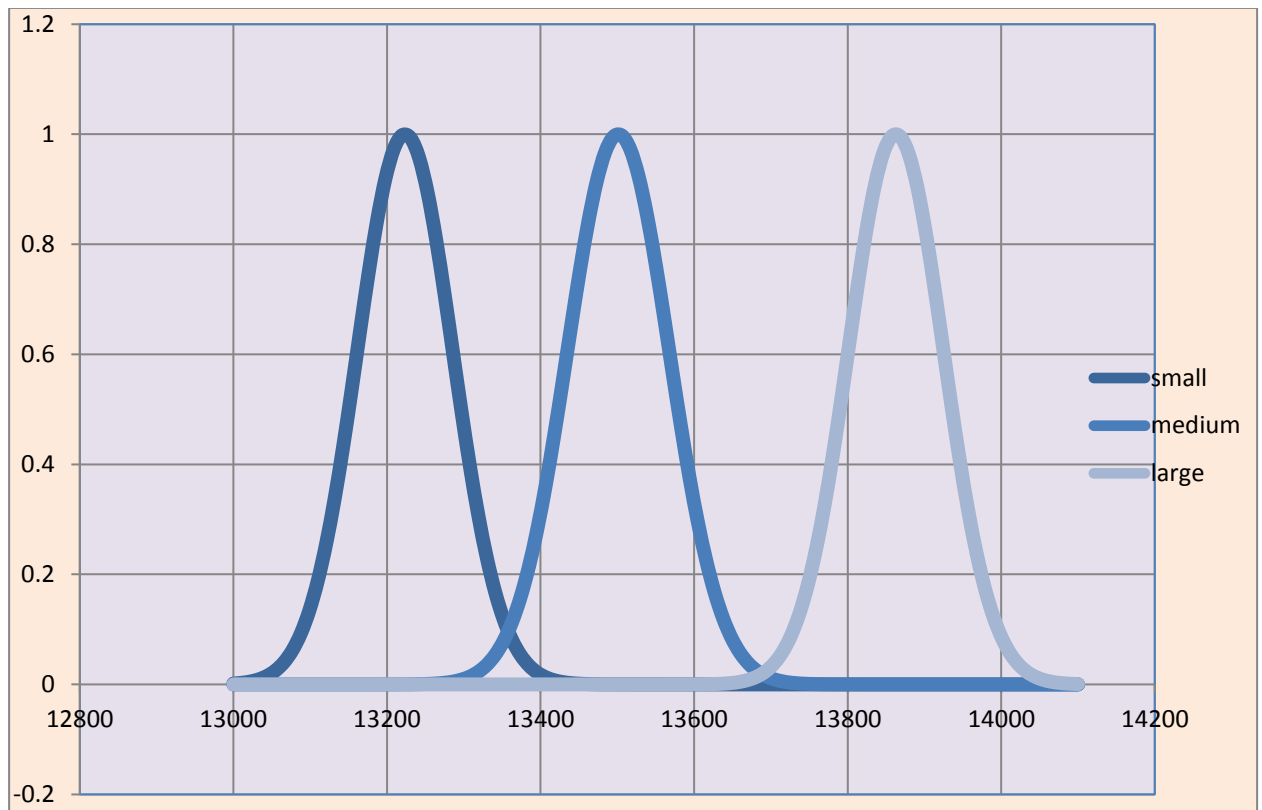
Contemporary Data Processing Technology (CCOD)

Lab (November 05, 2016)

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Prediction from time series dataset

1) Membership function:



Small:

avg:13223,486

std:7730,824

Medium:

avg:13501,289

std:8795,126

Large:

avg:13862,816

std:7699,625

2) Rules:

If $x(t-1) = \text{Small}$ and $x(t) = \text{Small}$ then $y = 1$

If $x(t-1) = \text{Small}$ and $x(t) = \text{Medium}$ then $y = 2$

If $x(t-1) = \text{Small}$ and $x(t) = \text{Large}$ then $y = 3$

If $x(t-1) = \text{Medium}$ and $x(t) = \text{Small}$ then $y = 4$

If $x(t-1) = \text{Medium}$ and $x(t) = \text{Medium}$ then $y = 5$

If $x(t-1) = \text{Medium}$ and $x(t) = \text{Large}$ then $y = 6$

If $x(t-1) = \text{Large}$ and $x(t) = \text{Small}$ then $y = 7$

If $x(t-1) = \text{Large}$ and $x(t) = \text{Medium}$ then $y = 8$

If $x(t-1) = \text{Large}$ and $x(t) = \text{Large}$ then $y = 9$

3) Create table, fill column y and prediction:

t	x(t)	x(t-1)	how-big	x(t-2)	how-big	y	prediction x(t)
0	13725,13	---	---	---	---	---	---
1	13815,6	13725,13	large	---	---	---	---
2	13739,39	13815,6	large	13725,13	large	9	13862,82
3	13403,42	13739,39	large	13815,6	large	9	13862,82
4	13442,52	13403,42	medium	13739,39	large	6	13223,49
5	13424,88	13442,52	medium	13403,42	medium	5	13501,29
6	13305,47	13424,88	medium	13442,52	medium	5	13501,29
7	13270,68	13305,47	small	13424,88	medium	2	13501,29
8	13657,86	13270,68	small	13305,47	small	1	13862,82
9	13904,3	13657,86	medium	13270,68	small	4	13223,49
10	13468,78	13904,3	large	13657,86	medium	8	13501,29
11	13181,91	13468,78	medium	13904,3	large	6	13223,49
12	13463,33	13181,91	small	13468,78	medium	2	13501,29
13	13785,79	13463,33	medium	13181,91	small	4	13223,49
14	13716,95	13785,79	large	13463,33	medium	8	13501,29
15	13943,42	13716,95	large	13785,79	large	9	13862,82
16	13851,08	13943,42	large	13716,95	large	9	13862,82
17	13785,79	13851,08	large	13943,42	large	9	13862,82
18	13716,95	13785,79	large	13851,08	large	9	13862,82
19	13943,42	13716,95	large	13785,79	large	9	13862,82
20	13851,08	13943,42	large	13716,95	large	9	13862,82
21	13362,37	13851,08	large	13943,42	large	9	13862,82
22	13211,99	13362,37	medium	13851,08	large	5	13501,29
23	13358,31	13211,99	small	13362,37	medium	2	13501,29
24	13265,47	13358,31	medium	13211,99	small	3	13223,49
25	13473,57	13265,47	small	13358,31	medium	2	13501,29
26	13785,79	13473,57	medium	13265,47	small	4	13223,49
27	13716,95	13785,79	large	13473,57	medium	8	13501,29
28	13943,42	13716,95	large	13785,79	large	9	13862,82
29	13851,08	13943,42	large	13716,95	large	9	13862,82

30	14000,41	13851,08	large	13943,42	large	9	13862,82
31	13448,86	14000,41	large	13851,08	large	9	13862,82
32	13351,74	13448,86	medium	14000,41	large	6	13223,49
33	13028,92	13351,74	small	13448,86	medium	3	13223,49
34	13226,53	13028,92	small	13351,74	small	1	13862,82
35	13918,22	13226,53	small	13028,92	small	1	13862,82
36	13971,55	13918,22	large	13226,53	small	7	13501,29
37	13950,98	13971,55	large	13918,22	large	9	13862,82
38	13907,25	13950,98	large	13971,55	large	9	13862,82
39	13861,75	13907,25	large	13950,98	large	9	13862,82
40	13577,87	13861,75	large	13907,25	large	9	13862,82
41	13501,7	13577,87	medium	13861,75	large	6	13223,49
42	13649,97	13501,7	medium	13577,87	medium	5	13501,29
43	13649,97	13649,97	medium	13501,7	medium	5	13501,29
44	13611,68	13649,97	medium	13649,97	medium	5	13501,29
45	13565,84	13611,68	medium	13649,97	medium	5	13501,29
46	13577,3	13565,84	medium	13611,68	medium	5	13501,29
47	13289,29	13577,3	medium	13565,84	medium	5	13501,29
48	13041,85	13289,29	small	13577,3	medium	2	13501,29
49	13322,13	13041,85	small	13289,29	small	1	13862,82
50	13378,87	13322,13	small	13041,85	small	1	13862,82
51	13235,88	13378,87	medium	13322,13	small	3	13223,49
52	13226,53	13235,88	small	13378,87	medium	2	13501,29
53	13918,22	13226,53	small	13235,88	small	1	13862,82
54	13971,55	13918,22	large	13226,53	small	7	13501,29
55	13468,78	13971,55	large	13918,22	large	9	13862,82
56	13181,91	13468,78	medium	13971,55	large	6	13223,49
57	13463,33	13181,91	small	13468,78	medium	2	13501,29
58	13950,98	13463,33	medium	13181,91	small	4	13223,49
59	13907,25	13950,98	large	13463,33	medium	8	13501,29
60	13861,75	13907,25	large	13950,98	large	9	13862,82
61	13577,87	13861,75	large	13907,25	large	9	13862,82
62	13211,99	13577,87	medium	13861,75	large	6	13223,49
63	---	13211,99	small	13577,87	medium	2	13501,29

4) Graphs and rules of prediction:

Rules of prediction:

If $y=3$ or $y=4$ or $y=6$, then **Small**.

If $y=2$ or $y=5$ or $y=7$ or $y=8$, then **Medium**.

If $y=1$ or $y=9$, then **Large**.

