Contemporary Data Processing Technology (CCOD)

Lab 11 05.11.2016

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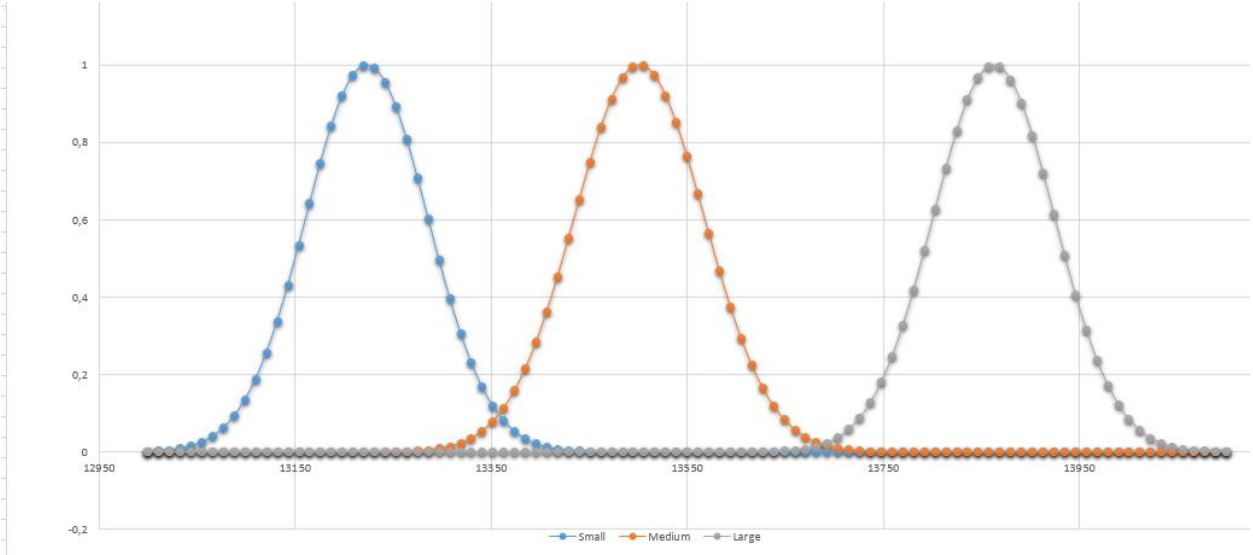
Prediction from Time-Series dataset

1. Create 3 membership function of small, medium, large from dataset



small:
avg:13223,486
std:7730,824
---
medium:
avg:13501,289
std:8795,126
---
large:
avg:13862,816
std:7699,625

2. Design 9 rules such as IF x(t-1) = large AND x(t) = medium then y_i
   1) If x(t-1) = **Small** and x(t) = **Small** then **y = 1**
   2) If x(t-1) = **Small** and x(t) = **Medium** then **y = 2**
   3) If x(t-1) = **Small** and x(t) = **Large** then **y = 3**
   4) If x(t-1) = **Medium** and x(t) = **Small** then **y = 4**
   5) If x(t-1) = **Medium** and x(t) = **Medium** then **y = 5**
   6) If x(t-1) = **Medium** and x(t) = **Large** then **y = 6**
   7) If x(t-1) = **Large** and x(t) = **Small** then **y = 7**
   8) If x(t-1) = **Large** and x(t) = **Medium** then **y = 8**

9) If x(t-1) = **Large** and x(t) = **Large** then **y = 9**

3,4,5. Create a table. Apply TS-rule (See p.34) and fill the column y. predict x(t) by y such as if y>5 then large, if 3<y<5 then medium, etc

Rules:

1) If y = 3 OR y = 4 OR y = 6 then **Small**
2) If y = 1 OR y = 2 OR y = 5 OR y = 7 then **Medium**
2) If y = 8 OR y = 9 then **Large**

Table:

t	x(t)	x(t)	how-big	x(t-2)	how-big	y	prediction x(t)
63	---	13211.99	small	13577.87	medium	2	13501.2895
62	13211.99	13577.87	medium	13861.75	large	6	13223.486
61	13577.87	13861.75	large	13907.25	large	9	13862.816
60	13861.75	13907.25	large	13950.98	large	9	13862.816
59	13907.25	13950.98	large	13463.33	medium	8	13862.816
58	13950.98	13463.33	medium	13181.91	small	4	13223.486
57	13463.33	13181.91	small	13468.78	medium	2	13501.2895
56	13181.91	13468.78	medium	13971.55	large	6	13223.486
55	13468.78	13971.55	large	13918.22	large	9	13862.816
54	13971.55	13918.22	large	13226.53	small	7	13501.2895
53	13918.22	13226.53	small	13235.88	small	1	13501.2895
52	13226.53	13235.88	small	13378.87	medium	2	13501.2895
51	13235.88	13378.87	medium	13322.13	small	3	13223.486
50	13378.87	13322.13	small	13041.85	small	1	13501.2895
49	13322.13	13041.85	small	13289.29	small	1	13501.2895
48	13041.85	13289.29	small	13577.3	medium	2	13501.2895
47	13289.29	13577.3	medium	13565.84	medium	5	13501.2895
46	13577.3	13565.84	medium	13611.68	medium	5	13501.2895
45	13565.84	13611.68	medium	13649.97	medium	5	13501.2895
44	13611.68	13649.97	medium	13649.97	medium	5	13501.2895
43	13649.97	13649.97	medium	13501.7	medium	5	13501.2895
42	13649.97	13501.7	medium	13577.87	medium	5	13501.2895
41	13501.7	13577.87	medium	13861.75	large	6	13223.486
40	13577.87	13861.75	large	13907.25	large	9	13862.816
39	13861.75	13907.25	large	13950.98	large	9	13862.816
38	13907.25	13950.98	large	13971.55	large	9	13862.816
37	13950.98	13971.55	large	13918.22	large	9	13862.816
36	13971.55	13918.22	large	13226.53	small	7	13501.2895
35	13918.22	13226.53	small	13028.92	small	1	13501.2895
34	13226.53	13028.92	small	13351.74	small	1	13501.2895
33	13028.92	13351.74	small	13448.86	medium	3	13223.486
32	13351.74	13448.86	medium	14000.41	large	6	13223.486
31	13448.86	14000.41	large	13851.08	large	9	13862.816
30	14000.41	13851.08	large	13943.42	large	9	13862.816
29	13851.08	13943.42	large	13716.95	large	9	13862.816
28	13943.42	13716.95	large	13785.79	large	9	13862.816
27	13716.95	13785.79	large	13473.57	medium	8	13862.816
26	13785.79	13473.57	medium	13265.47	small	4	13223.486
25	13473.57	13265.47	small	13358.31	medium	2	13501.2895
24	13265.47	13358.31	medium	13211.99	small	3	13223.486
23	13358.31	13211.99	small	13362.37	medium	2	13501.2895
22	13211.99	13362.37	medium	13851.08	large	5	13501.2895
21	13362.37	13851.08	large	13943.42	large	9	13862.816
20	13851.08	13943.42	large	13716.95	large	9	13862.816
19	13943.42	13716.95	large	13785.79	large	9	13862.816
18	13716.95	13785.79	large	13851.08	large	9	13862.816
17	13785.79	13851.08	large	13943.42	large	9	13862.816
16	13851.08	13943.42	large	13716.95	large	9	13862.816
15	13943.42	13716.95	large	13785.79	large	9	13862.816
14	13716.95	13785.79	large	13463.33	medium	8	13862.816
13	13785.79	13463.33	medium	13181.91	small	4	13223.486
12	13463.33	13181.91	small	13468.78	medium	2	13501.2895
11	13181.91	13468.78	medium	13904.3	large	6	13223.486
10	13468.78	13904.3	large	13657.86	medium	8	13862.816
9	13904.3	13657.86	medium	13270.68	small	4	13223.486
8	13657.86	13270.68	small	13305.47	small	1	13501.2895
7	13270.68	13305.47	small	13424.88	medium	2	13501.2895
6	13305.47	13424.88	medium	13442.52	medium	5	13501.2895
5	13424.88	13442.52	medium	13403.42	medium	5	13501.2895
4	13442.52	13403.42	medium	13739.39	large	6	13223.486
3	13403.42	13739.39	large	13815.6	large	9	13862.816
2	13739.39	13815.6	large	13725.13	large	9	13862.816
1	13815.6	13725.13	large	---	---	---	---
0	13725.13	---	---	---	---	---	---

6. Draw 2 graphs of x(t) and predicted x(t) = avg of prediction