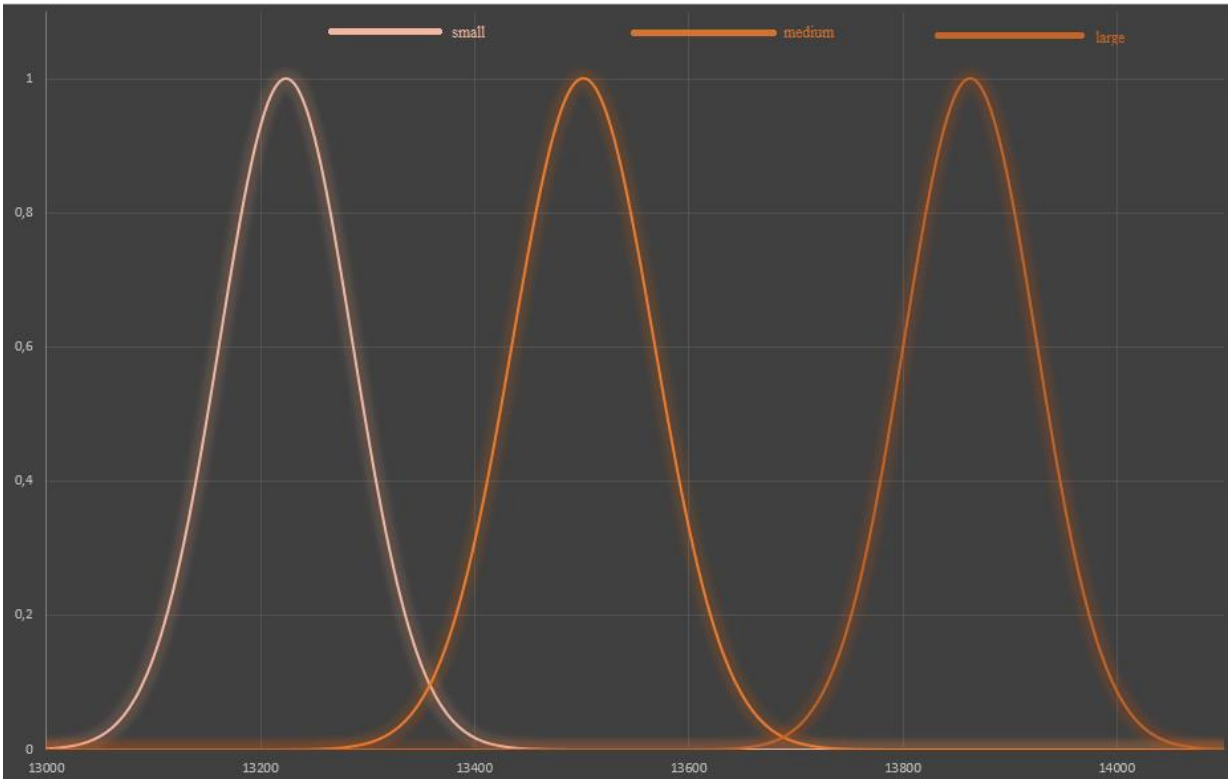
Lab 11 (November 5, 2016)

Fedorov Danil, AS-36

Prediction of x(t+1) from Time-Series dataset x(t) to x(t-63)

1. Created 3 membership function of small, medium, large from dataset (give me 3 graphs and avg and std each)



small:
avg:13223,486
std:7730,824

---

medium:
avg:13501,289
std:8795,126

---

large:
avg:13862,816
std:7699,625

2. Designed 9 rules:

```
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=3
3. IF x(t-1) = small AND x(t) = large then y=2
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=6
6. IF x(t-1) = medium AND x(t) = large then y=5
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=9
9. IF x(t-1) = large AND x(t) = large then y=8
```

3. Created the table with predictions:

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

4. Predicts x(t) and graphs:

- IF y<=3 then small
- IF y>=4&&y<=7 then medium
- IF y>=8 then large