Assignment 3

1.

- **a.** 10.2
- **b.** 10.5
- **c.** 2.7
- **d.** The mean decreases; The median remains the same; The sd increases
- **e.** Mean = 9.9; Median = 10; Sd = 3.1

2.

- **a.** 3
- **b.** 0.25
- **c.** 134
- **d.** 128 164
- **e.** About average; Unusually short; Unusually tall; About average

3.

- **a.** 31.74% 52~128 mg/dL
- **b.** 4.56% 14~166mg/dL

4. C

5. D

6.

- **b.** Both close to 0

Assignment 4

1.

- **a.** 0.55
- **b.** 2.32
- **c.** (2.05, 2.59)
- **d.** (2.23, 2.41)

2. 92.81%

3.

Hypothesis:

Null hypothesis: the mean of sample population is 13.

Alternative hypothesis: the mean of sample population is less than 13.

Simulation:

- Generate a group of samples (120 or 30) whose mean is 11.7 and sd is 3.2
- Calculate the mean of the group to check whether it is not less than 13
- Repeat the procedure for 10000 times and count the frequency when group mean is not less than 13
- Calculate p by dividing the frequency by 10000

Results:

Sample 120 : by simulation, p-value is close to 0; by calculation, p is 9.7e-06.

Sample 30 : by simulation, p-value is close to 0.012; by calculation, p is 0.017.

Assignment 5

1. Each group should have at least 69 samples
2.
   a. [1.078, 1.134], 0.014; [0.9490, 1.0422], 0.024
   b. 88.54%

Assignment 6

1. Significantly below
2. When sample numbers are really small and the distribution fit the normal distribution, use t test

	90%	95%	99%
One side	1.812	2.228	3.169
Two side	1.377	1.813	2.764

Assignment 7

1. t = 11.84, reject H_0
2. t = -1.66, fail to reject H_0
3. t = -3.39, reject H_0
4. t = 2.19, reject H_0

Assignment 8

1.
   a. F=36.48, reject H_0
   b. t=6.03, reject H_0
2.
   b. F = 7.72, reject H_0
   c. F = 8.09, reject H_0
3.
   a. (0.696,15.304)

b. P-value < 0.05 reject H_0, consistent with CI.

Assignment 9

1. F(crop) = 2.572,p-value > 0.05;
F(fertilizer) = 9.933, p-value < 0.05;
F(crop * fertilizer) = 2.347,p-value < 0.05.

2. F(teaching methods) = 0.117, p-value < 0.05. (Interaction or not are both OK)

Assignment 10

2. Yes, R = 0.907, t=7.78; Yes, t=3.43

3. y = 10.112 + 0.343x

Assignment 11

1. T=73 and 137, reject H_0

2. T+ =23.5, T- = -12.5, fail to reject H_0

3. H = 7.35, reject H_0

4. ρ = 0.708, t = 4.59, reject H_0

Assignment 12

1. chisq = 20.18, reject H_0

2. chisq = 870.34, reject H_0

Assignment 13

	Prednisolone(n=22)					Control(n=22)				
i	t(i)	n(i)	d(i)	λ (i)	S(ti)	t(i)	n(i)	d(i)	λ (i)	S(ti)
1	2	22	1	0.045	0.955	1	22	1	0.045	0.955
2	6	21	1	0.048	0.909	3	21	1	0.048	0.910
3	12	20	1	0.050	0.864	4	20	1	0.050	0.864
4	54	19	1	0.053	0.818	7	19	1	0.053	0.819
5	56*	18	0	0	0.818	10	18	1	0.056	0.773
6	68	17	1	0.059	0.770	22	17	1	0.059	0.728
7	89	16	1	0.063	0.721	28	16	1	0.063	0.682
8	96	15	1	0.067	0.673	29	15	1	0.067	0.637

9	96	14	1	0.071	0.625	32	14	1	0.071	0.591
10	125*	13	0	0	0.625	37	13	1	0.077	0.546
11	128*	12	0	0	0.625	40	12	1	0.083	0.500
12	131*	11	0	0	0.625	41	11	1	0.091	0.455
13	140*	10	0	0	0.625	54	10	1	0.100	0.409
14	141*	9	0	0	0.625	61	9	1	0.111	0.364
15	143	8	1	0.125	0.547	63	8	1	0.125	0.318
16	145*	7	0	0	0.547	71	7	1	0.143	0.273
17	146	6	1	0.167	0.456	127*	6	0	0.000	0.273
18	148*	5	0	0	0.456	140*	5	0	0.000	0.273
19	162*	4	0	0	0.456	146*	4	0	0.000	0.273
20	168	3	1	0.333	0.304	158*	3	0	0.000	0.273
21	173*	2	0	0	0.304	167*	2	0	0.000	0.273
22	181*	1	0	0	0.304	182*	1	0	0.000	0.273