HW-3

Weilin-Lu

Q1

1:

(152-13)/3=46.33

So,bin interval are[0.,59.33),[59.33,105.66),[105.66,152]

Bin 1: 13,38,41,44,45

Bin 2: 81,83,88,90,95,103

Bin 3: 125,129,137,152

Smoothing by bin means

Bin 1: 36.2,36.2,36.2,36.2,36.2

Bin 2: 90,90,90,90,90

Bin 3: 135.75,135.75,135.75,135.75

Smoothing by bin median

Bin 1: 41,41,41,41,41

Bin 2: 89,89,89,89,89

Bin 3: 133,133,133,133

Smoothing by bin boundaries

Bin 1: 13,45,45,45,45

Bin 2: 81,103,103,103,103,103

Bin 3: 125,125,125,152

2:

Partition into equal depth bin

Bin 1: 13,38,41,44,45

Bin 2: 81,83,88,90,95

Bin 3: 103,125,129,137,152

Smoothing by mean

Bin 1: 36.2,36.2,36.2,36.2,36.2

Bin 2: 87.4,87.4,87.4,87.4,87.4

Bin 3: 129.2,129.2,129.2,129.2

Smoothing by median

Bin 1: 41,41,41,41,41

Bin 2: 88,88,88,88,88

Bin 3: 129,129,129,129,129

Smoothing by bin boundaries

Bin 1: 13,13,13,13,45

Bin 2: 81,81,95,95,95

Bin 3: 103,103,103,152

3:

V”=new_min+{(v-min)/(max-min)}*(new_max-new_min)

=0+{(125-13)/(152-13)}*10

= 8.0576

4:

Standard deviation

Mean = 84.27

Std=41.24

v'=(v-mean)/std

=(125-84.27)/41.24

=0.99

5

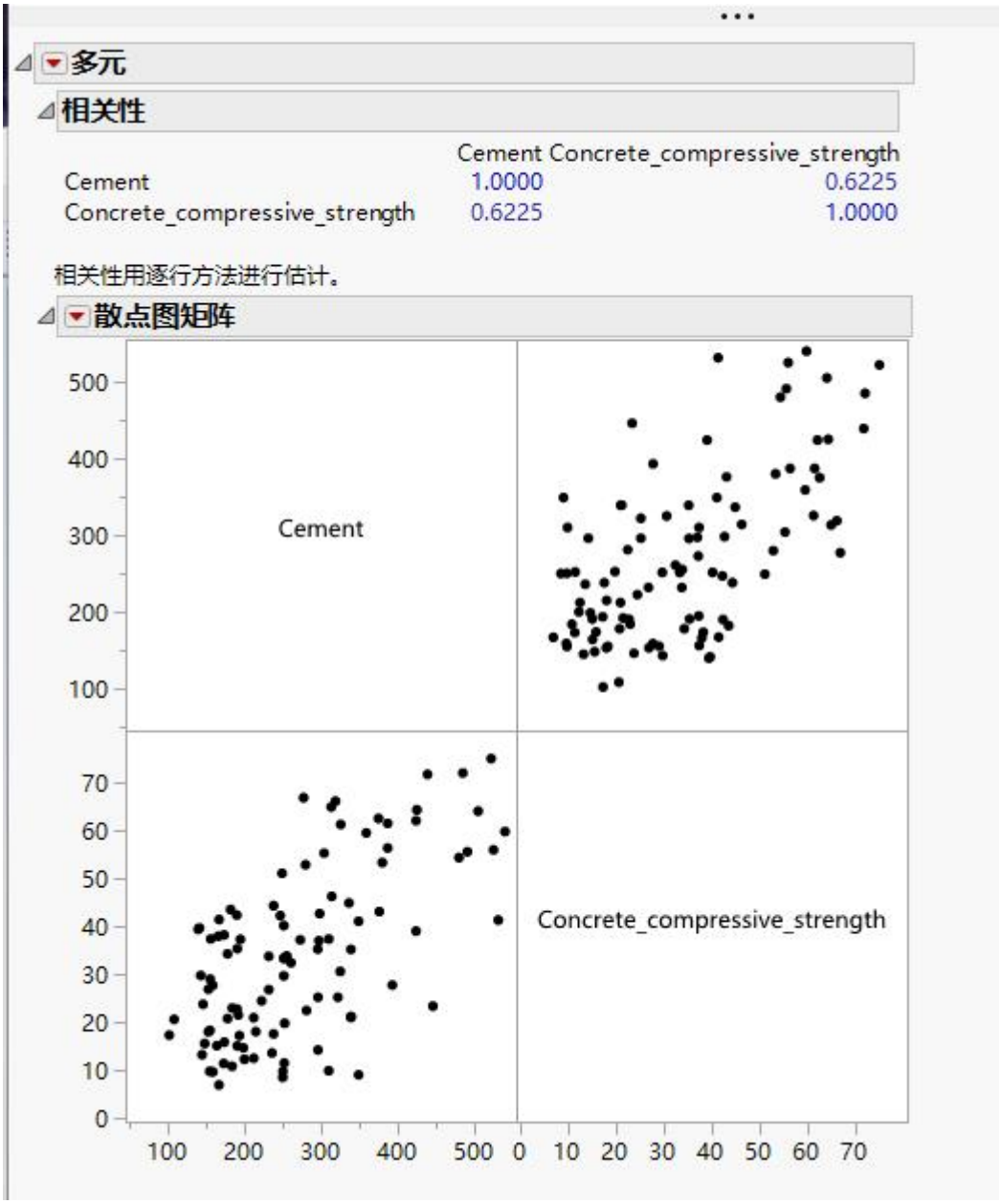
Absolute standard deviation

S=(|13-84.27|+|38-84.27|+|41-84.27|+|44-84.27|+|45-84.27|+|81-84.27|+|83-84.27|+|88-84.27|+|90-84.27|+|95-84.27|+|103-84.27|+|125-84.27|+|129-84.27|+|137-84.27|+|152-84.27|)/15=32.649

v'=(v-mean)/ab std=(125-84.27)/32.649=1.28

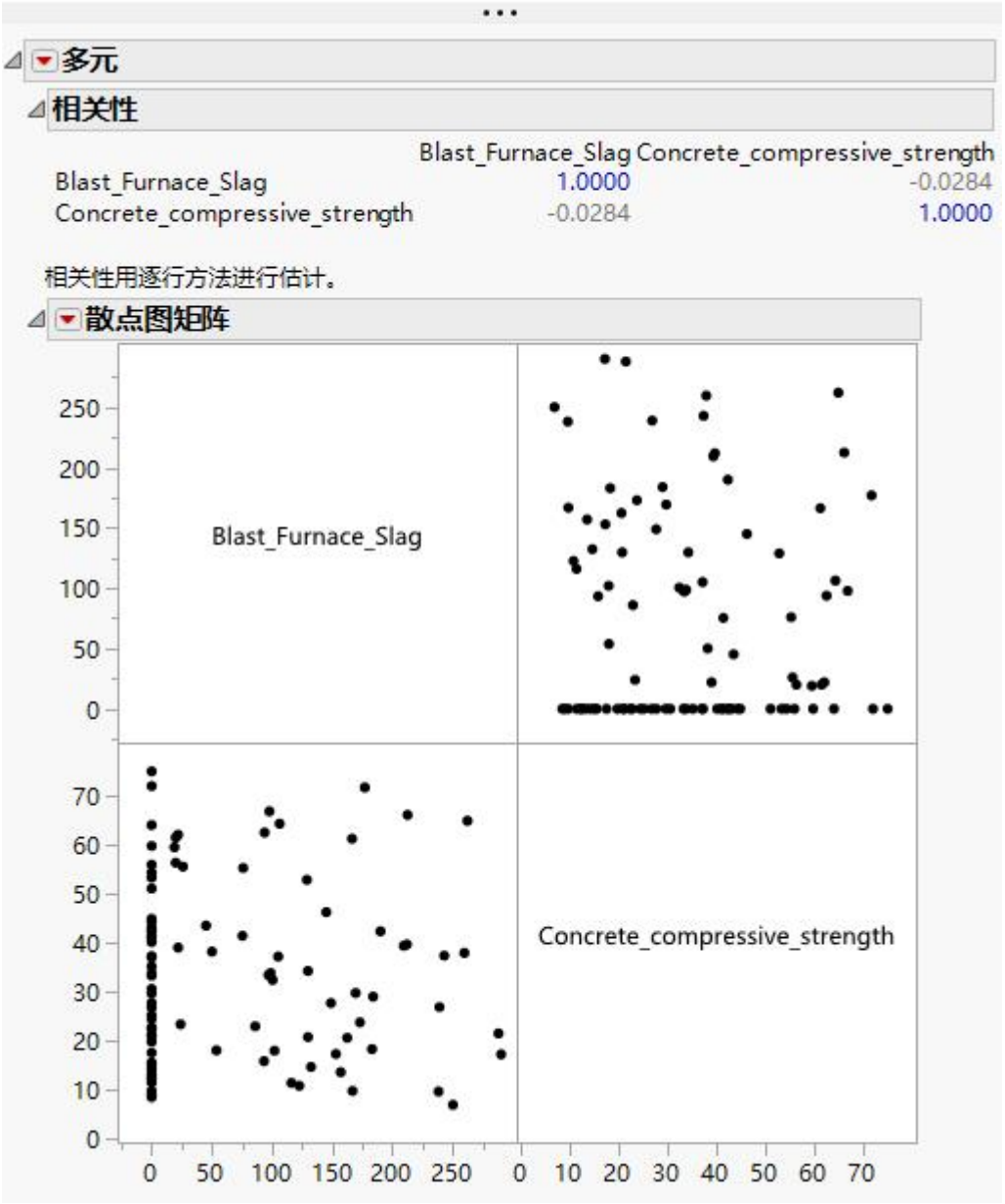
Q2

Correlation between *Cement* and *Concrete_compressive_strength*



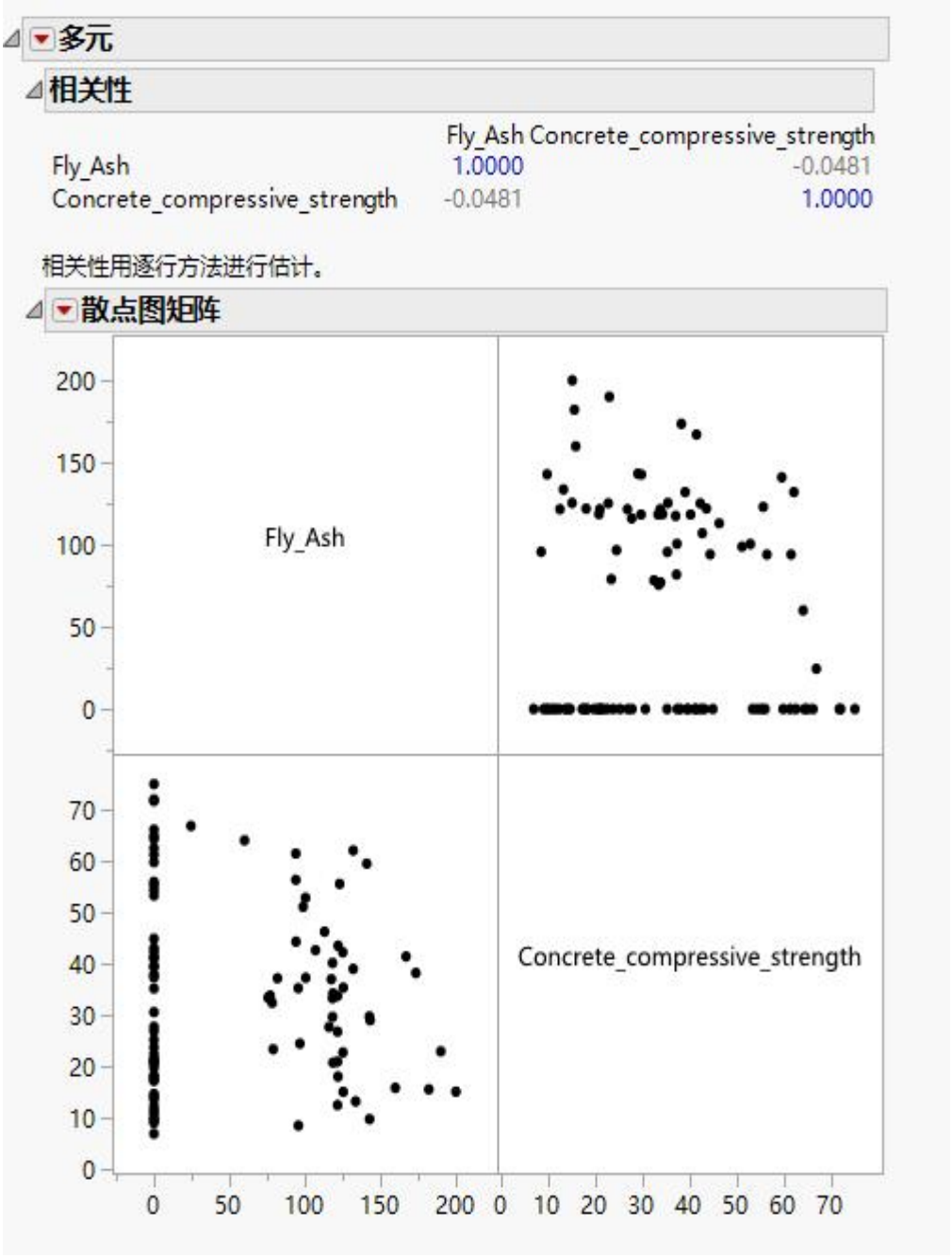
0.6225

Correlation between *Blast_Furnace_Slag* and *Concrete_compressive_strength*



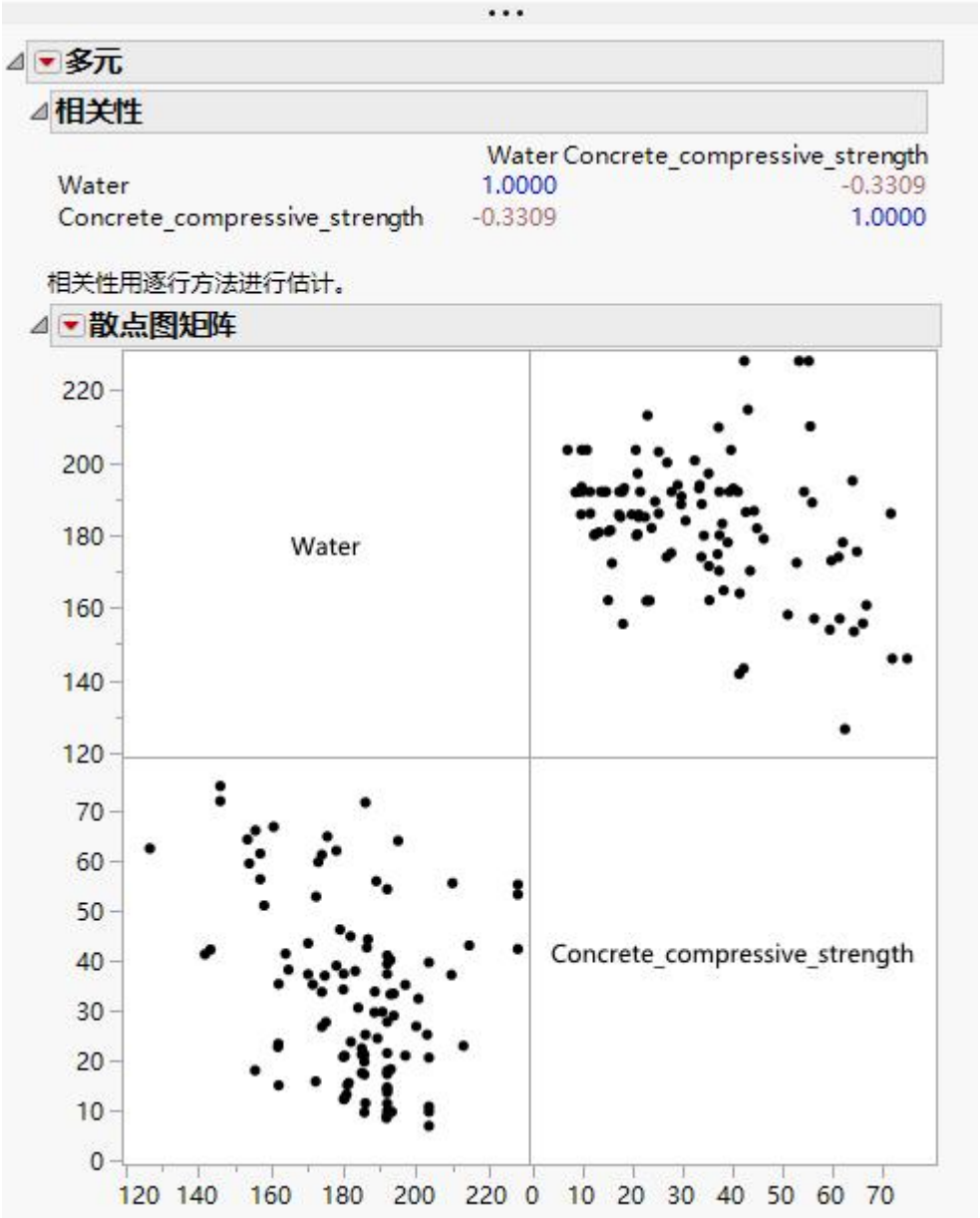
-0.0284

Correlation between *Fly_Ash* and *Concrete_compressive_strength*



-0.0481

Correlation between *Water* and *Concrete_compressive_strength*



-0.3309

According to the previous picture and data, Cement has the strongest correlation with Concrete_compressive_strength

Q3

gender	readmitted			
	计数 合计百分比 列百分比 行百分比 期望值	<30	>30	NO	合计
Female		294	936	1453	2683
		5.88	18.72	29.06	53.66
		52.97	54.61	53.20	
		10.96	34.89	54.16	
		297.813	919.732	1465.45	
Male		261	778	1278	2317
		5.22	15.56	25.56	46.34
		47.03	45.39	46.80	
		11.26	33.58	55.16	
		257.187	794.268	1265.55	
合计		555	1714	2731	5000
		11.10	34.28	54.62	

$$\frac{(294-297.813)^2}{297.813}+\frac{(936-919.732)^2}{919.732}+\frac{(1453-1465.45)^2}{1465.45}+$$
$$\frac{(261-257.187)^2}{257.187}+\frac{(778-794.268)^2}{794.268}+\frac{(1278-1265.55)^2}{1265.55}$$

=0.9545

		readmitted			
	计数 合计百分比 列百分比 行百分比 期望值	<30	>30	NO	合计
insulin	Down	85 1.70 15.32 13.62 69.264	240 4.80 14.00 38.46 213.907	299 5.98 10.95 47.92 340.829	624 12.48
	No	237 4.74 42.70 10.37 253.746	764 15.28 44.57 33.42 783.641	1285 25.70 47.05 56.21 1248.61	2286 45.72
	Steady	166 3.32 29.91 10.77 171.051	498 9.96 29.05 32.32 528.255	877 17.54 32.11 56.91 841.694	1541 30.82
	Up	67 1.34 12.07 12.20 60.939	212 4.24 12.37 38.62 188.197	270 5.40 9.89 49.18 299.864	549 10.98
	合计	555 11.10	1714 34.28	2731 54.62	5000

$$\frac{(85-69.264)^2}{69.264}+\frac{(240-213.907)^2}{213.907}+\frac{(299-340.829)^2}{340.829}+\frac{(237-253.746)^2}{253.746}+\frac{(764-783.641)^2}{783.641}+\frac{(1285-1248.61)^2}{1248.61}+\frac{(166-171.051)^2}{171.051}+\frac{(498-528.255)^2}{528.255}+\frac{(877-841.694)^2}{841.694}+\frac{(67-60.939)^2}{60.939}+\frac{(212-188.197)^2}{188.197}+\frac{(270-299.864)^2}{299.864}$$

=24.5003