

# The SAS System

## Clustering Clusters by Ward's Method

Obs	Species	SepalLength	SepalWidth	PetalLength	PetalWidth
1	Setosa	50	33	14	2
2	Setosa	46	34	14	3
3	Setosa	46	36	10	2
4	Setosa	51	33	17	5
5	Setosa	55	35	13	2
6	Setosa	48	31	16	2
7	Setosa	52	34	14	2
8	Setosa	49	36	14	1
9	Setosa	44	32	13	2
10	Setosa	50	35	16	6
11	Setosa	44	30	13	2
12	Setosa	47	32	16	2
13	Setosa	48	30	14	3
14	Setosa	51	38	16	2
15	Setosa	48	34	19	2
16	Setosa	50	30	16	2
17	Setosa	50	32	12	2
18	Setosa	43	30	11	1
19	Setosa	58	40	12	2
20	Setosa	51	38	19	4
21	Setosa	49	30	14	2
22	Setosa	51	35	14	2
23	Setosa	50	34	16	4
24	Setosa	46	32	14	2
25	Setosa	57	44	15	4
26	Setosa	50	36	14	2
27	Setosa	54	34	15	4
28	Setosa	52	41	15	1
29	Setosa	55	42	14	2
30	Setosa	49	31	15	2
31	Setosa	54	39	17	4
32	Setosa	50	34	15	2
33	Setosa	44	29	14	2
34	Setosa	47	32	13	2
35	Setosa	46	31	15	2
36	Setosa	51	34	15	2
37	Setosa	50	35	13	3

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Obs	Species	SepalLength	SepalWidth	PetalLength	PetalWidth
38	Setosa	49	31	15	1
39	Setosa	54	37	15	2
40	Setosa	54	39	13	4
41	Setosa	51	35	14	3
42	Setosa	48	34	16	2
43	Setosa	48	30	14	1
44	Setosa	45	23	13	3
45	Setosa	57	38	17	3
46	Setosa	51	38	15	3
47	Setosa	54	34	17	2
48	Setosa	51	37	15	4
49	Setosa	52	35	15	2
50	Setosa	53	37	15	2
51	Versicolor	65	28	46	15
52	Versicolor	62	22	45	15
53	Versicolor	59	32	48	18
54	Versicolor	61	30	46	14
55	Versicolor	60	27	51	16
56	Versicolor	56	25	39	11
57	Versicolor	57	28	45	13
58	Versicolor	63	33	47	16
59	Versicolor	70	32	47	14
60	Versicolor	64	32	45	15
61	Versicolor	61	28	40	13
62	Versicolor	55	24	38	11
63	Versicolor	54	30	45	15
64	Versicolor	58	26	40	12
65	Versicolor	55	26	44	12
66	Versicolor	50	23	33	10
67	Versicolor	67	31	44	14
68	Versicolor	56	30	45	15
69	Versicolor	58	27	41	10
70	Versicolor	60	29	45	15
71	Versicolor	57	26	35	10
72	Versicolor	57	29	42	13
73	Versicolor	49	24	33	10
74	Versicolor	56	27	42	13

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Obs	Species	SepalLength	SepalWidth	PetalLength	PetalWidth
75	Versicolor	57	30	42	12
76	Versicolor	66	29	46	13
77	Versicolor	52	27	39	14
78	Versicolor	60	34	45	16
79	Versicolor	50	20	35	10
80	Versicolor	55	24	37	10
81	Versicolor	58	27	39	12
82	Versicolor	62	29	43	13
83	Versicolor	59	30	42	15
84	Versicolor	60	22	40	10
85	Versicolor	67	31	47	15
86	Versicolor	63	23	44	13
87	Versicolor	56	30	41	13
88	Versicolor	63	25	49	15
89	Versicolor	61	28	47	12
90	Versicolor	64	29	43	13
91	Versicolor	51	25	30	11
92	Versicolor	57	28	41	13
93	Versicolor	61	29	47	14
94	Versicolor	56	29	36	13
95	Versicolor	69	31	49	15
96	Versicolor	55	25	40	13
97	Versicolor	55	23	40	13
98	Versicolor	66	30	44	14
99	Versicolor	68	28	48	14
100	Versicolor	67	30	50	17
101	Virginica	64	28	56	22
102	Virginica	67	31	56	24
103	Virginica	63	28	51	15
104	Virginica	69	31	51	23
105	Virginica	65	30	52	20
106	Virginica	65	30	55	18
107	Virginica	58	27	51	19
108	Virginica	68	32	59	23
109	Virginica	62	34	54	23
110	Virginica	77	38	67	22
111	Virginica	67	33	57	25

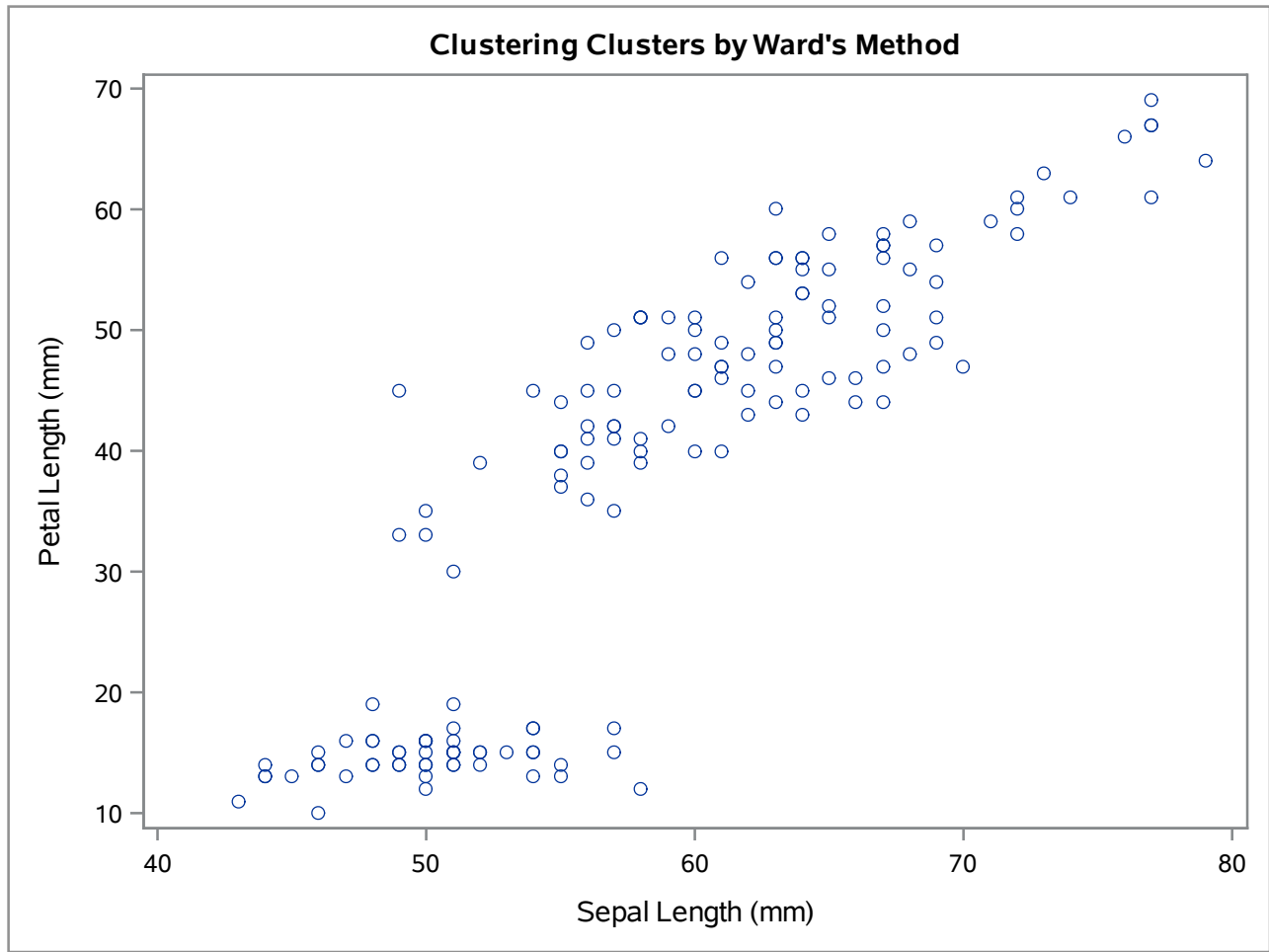
## The SAS System Clustering Clusters by Ward's Method

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Obs	Species	SepalLength	SepalWidth	PetalLength	PetalWidth
112	Virginica	76	30	66	21
113	Virginica	49	25	45	17
114	Virginica	67	30	52	23
115	Virginica	59	30	51	18
116	Virginica	63	25	50	19
117	Virginica	64	32	53	23
118	Virginica	79	38	64	20
119	Virginica	67	33	57	21
120	Virginica	77	28	67	20
121	Virginica	63	27	49	18
122	Virginica	72	32	60	18
123	Virginica	61	30	49	18
124	Virginica	61	26	56	14
125	Virginica	64	28	56	21
126	Virginica	62	28	48	18
127	Virginica	77	30	61	23
128	Virginica	63	34	56	24
129	Virginica	58	27	51	19
130	Virginica	72	30	58	16
131	Virginica	71	30	59	21
132	Virginica	64	31	55	18
133	Virginica	60	30	48	18
134	Virginica	63	29	56	18
135	Virginica	77	26	69	23
136	Virginica	60	22	50	15
137	Virginica	69	32	57	23
138	Virginica	74	28	61	19
139	Virginica	56	28	49	20
140	Virginica	73	29	63	18
141	Virginica	67	25	58	18
142	Virginica	65	30	58	22
143	Virginica	69	31	54	21
144	Virginica	72	36	61	25
145	Virginica	65	32	51	20
146	Virginica	64	27	53	19
147	Virginica	68	30	55	21
148	Virginica	57	25	50	20

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Clustering Clusters by Ward's Method

Obs	Species	SepalLength	SepalWidth	PetalLength	PetalWidth
149	Virginica	58	28	51	24
150	Virginica	63	33	60	25



The PRINCOMP Procedure

Observations	150
Variables	4

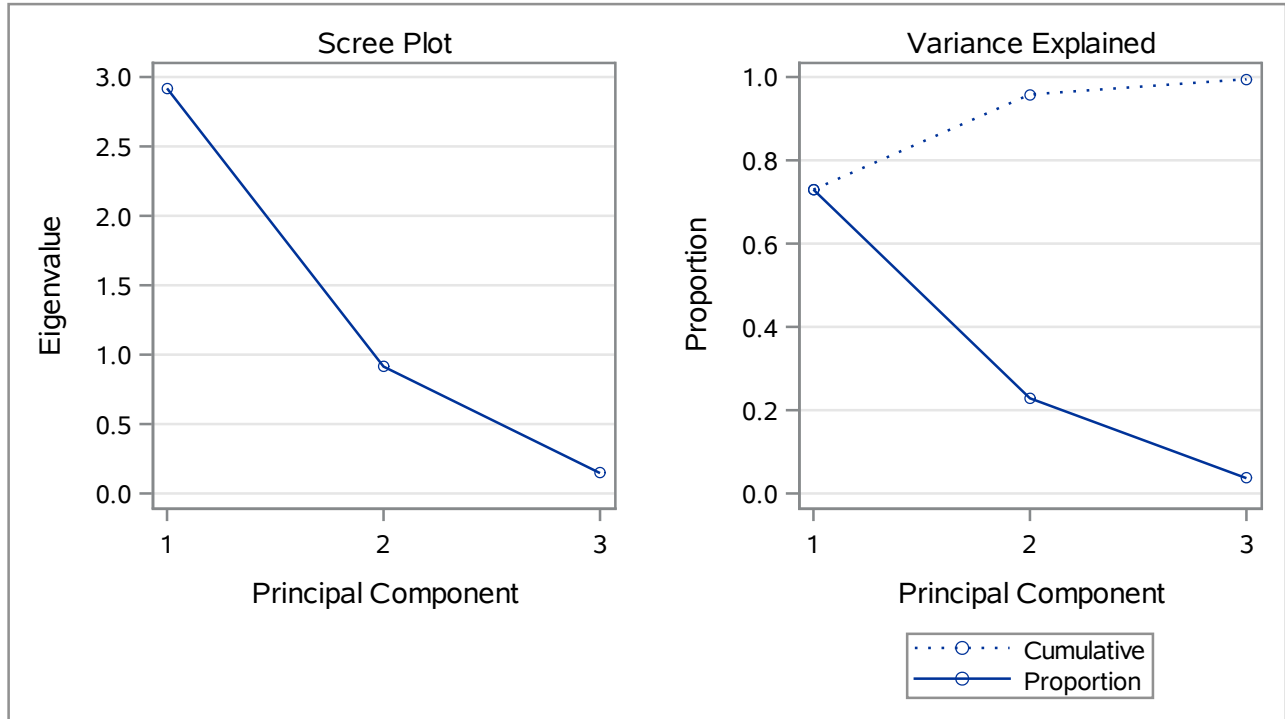
Simple Statistics				
	SepalLength	PetalLength	SepalWidth	PetalWidth
Mean	58.43333333	37.58000000	30.57333333	11.99333333
StD	8.28066128	17.65298233	4.35866285	7.62237669

Correlation Matrix					
		SepalLength	PetalLength	SepalWidth	PetalWidth
SepalLength	Sepal Length (mm)	1.0000	0.8718	-.1176	0.8179
PetalLength	Petal Length (mm)	0.8718	1.0000	-.4284	0.9629
SepalWidth	Sepal Width (mm)	-.1176	-.4284	1.0000	-.3661
PetalWidth	Petal Width (mm)	0.8179	0.9629	-.3661	1.0000

Eigenvalues of the Correlation Matrix				
	Eigenvalue	Difference	Proportion	Cumulative
1	2.91849782	2.00446735	0.7296	0.7296
2	0.91403047	0.76727360	0.2285	0.9581
3	0.14675688		0.0367	0.9948

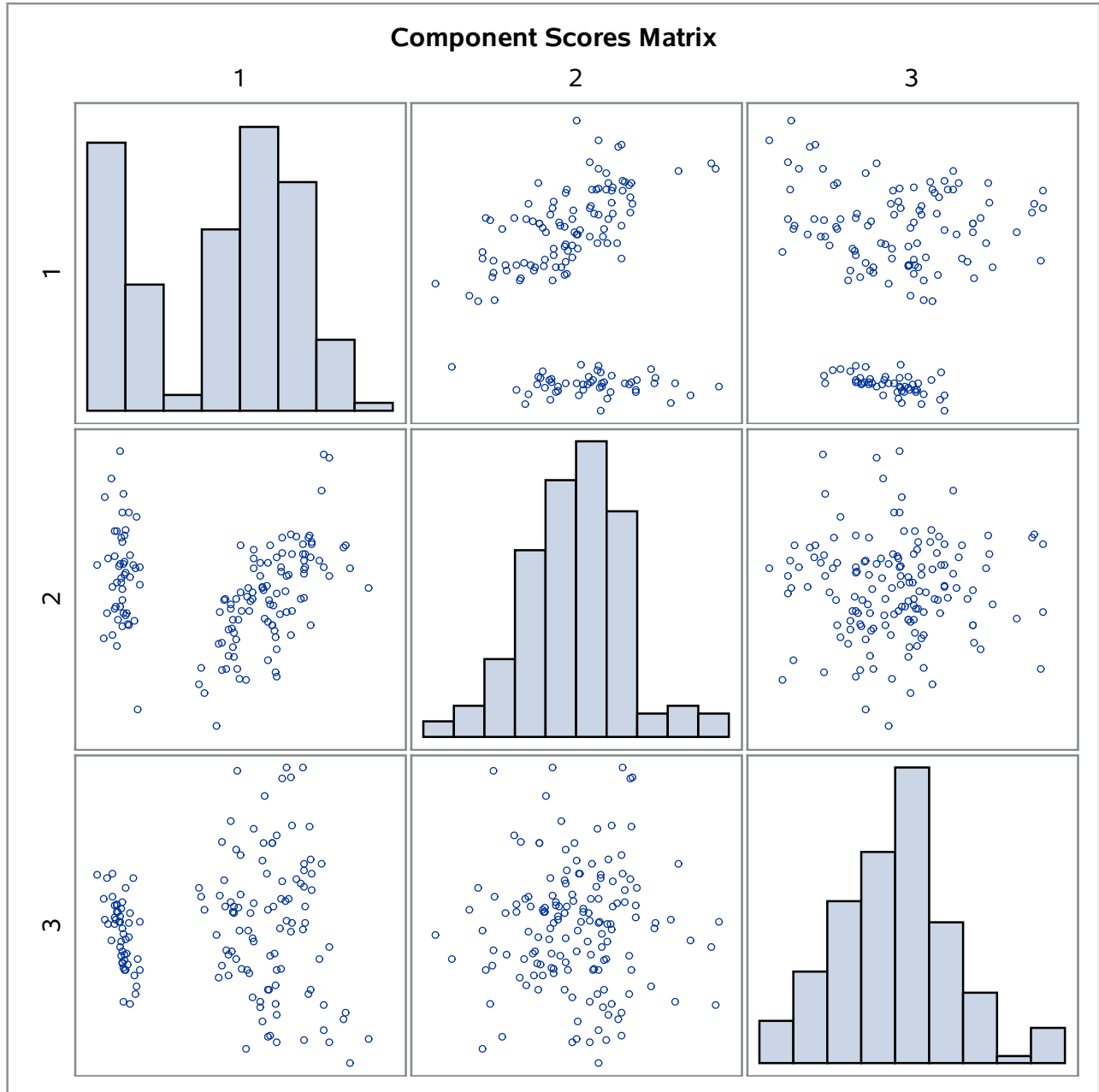
Eigenvectors				
		Prin1	Prin2	Prin3
SepalLength	Sepal Length (mm)	0.521066	0.377418	-.719566
PetalLength	Petal Length (mm)	0.580413	0.024492	0.142126
SepalWidth	Sepal Width (mm)	-.269347	0.923296	0.244382
PetalWidth	Petal Width (mm)	0.564857	0.066942	0.634273

The PRINCOMP Procedure

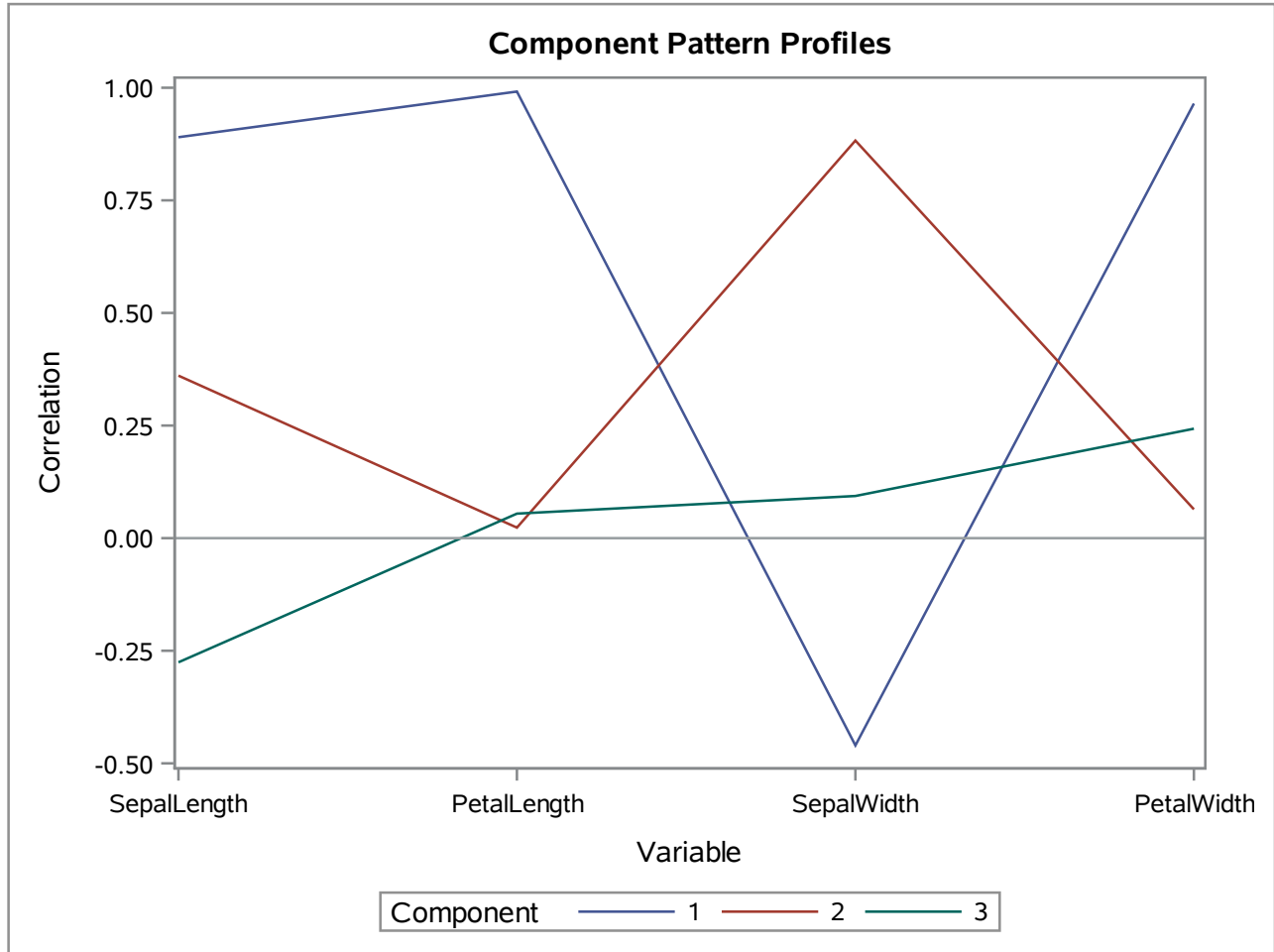




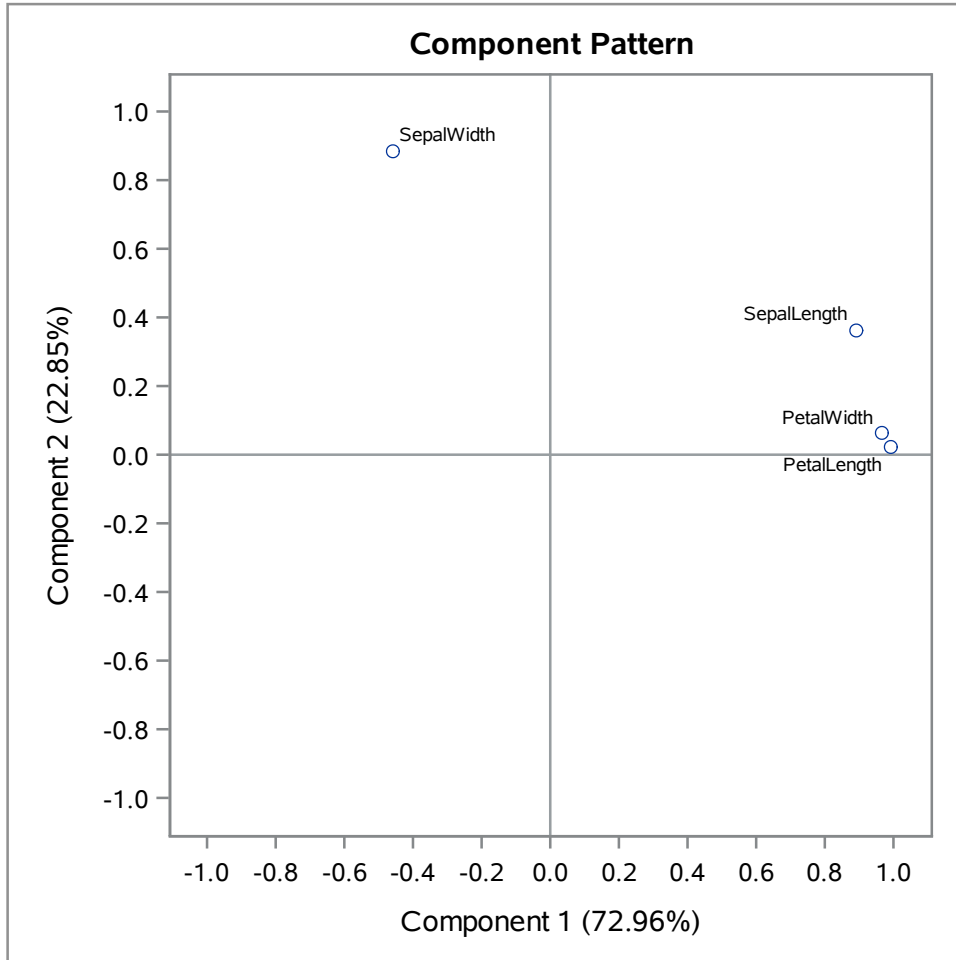
The PRINCOMP Procedure



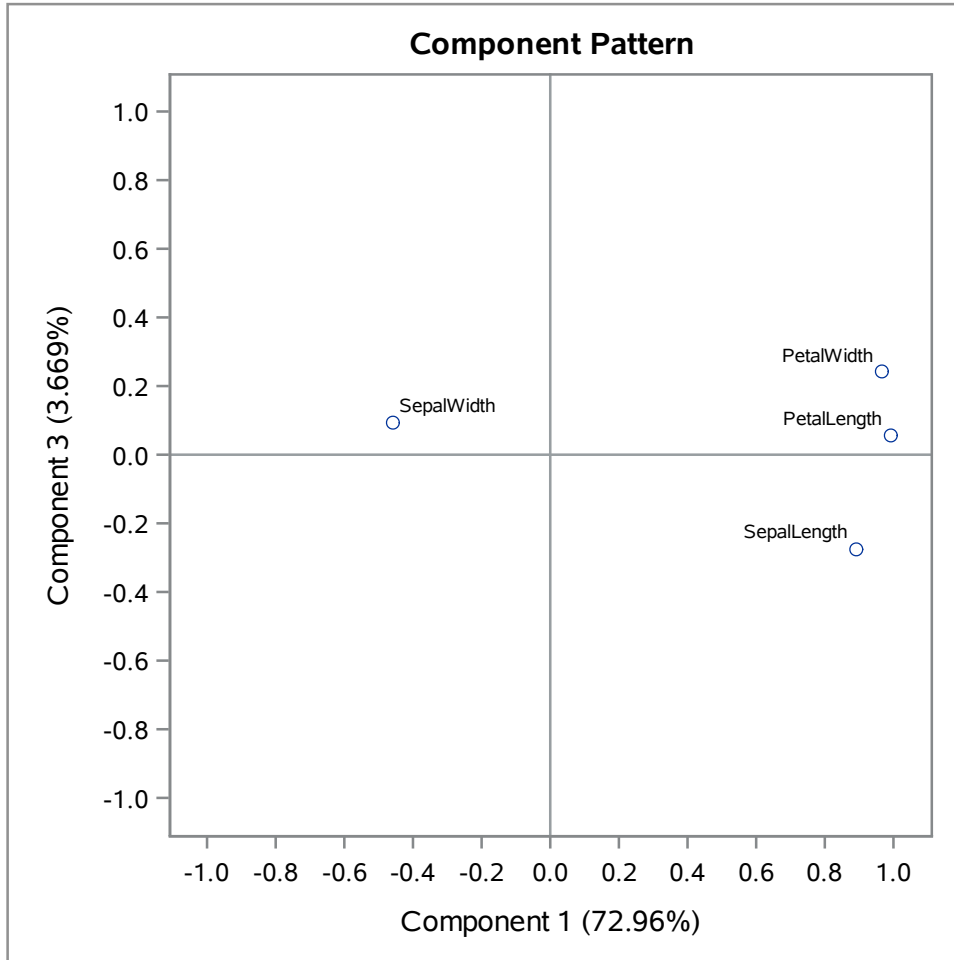
The PRINCOMP Procedure



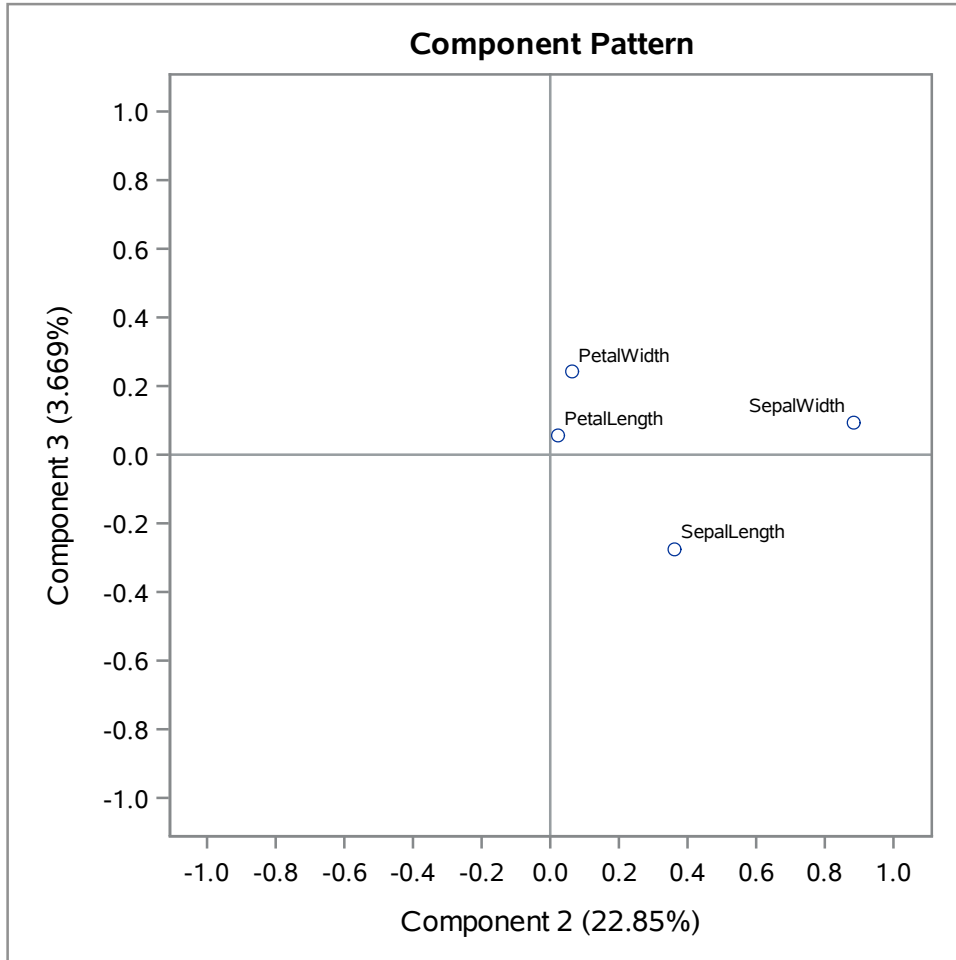
The PRINCOMP Procedure



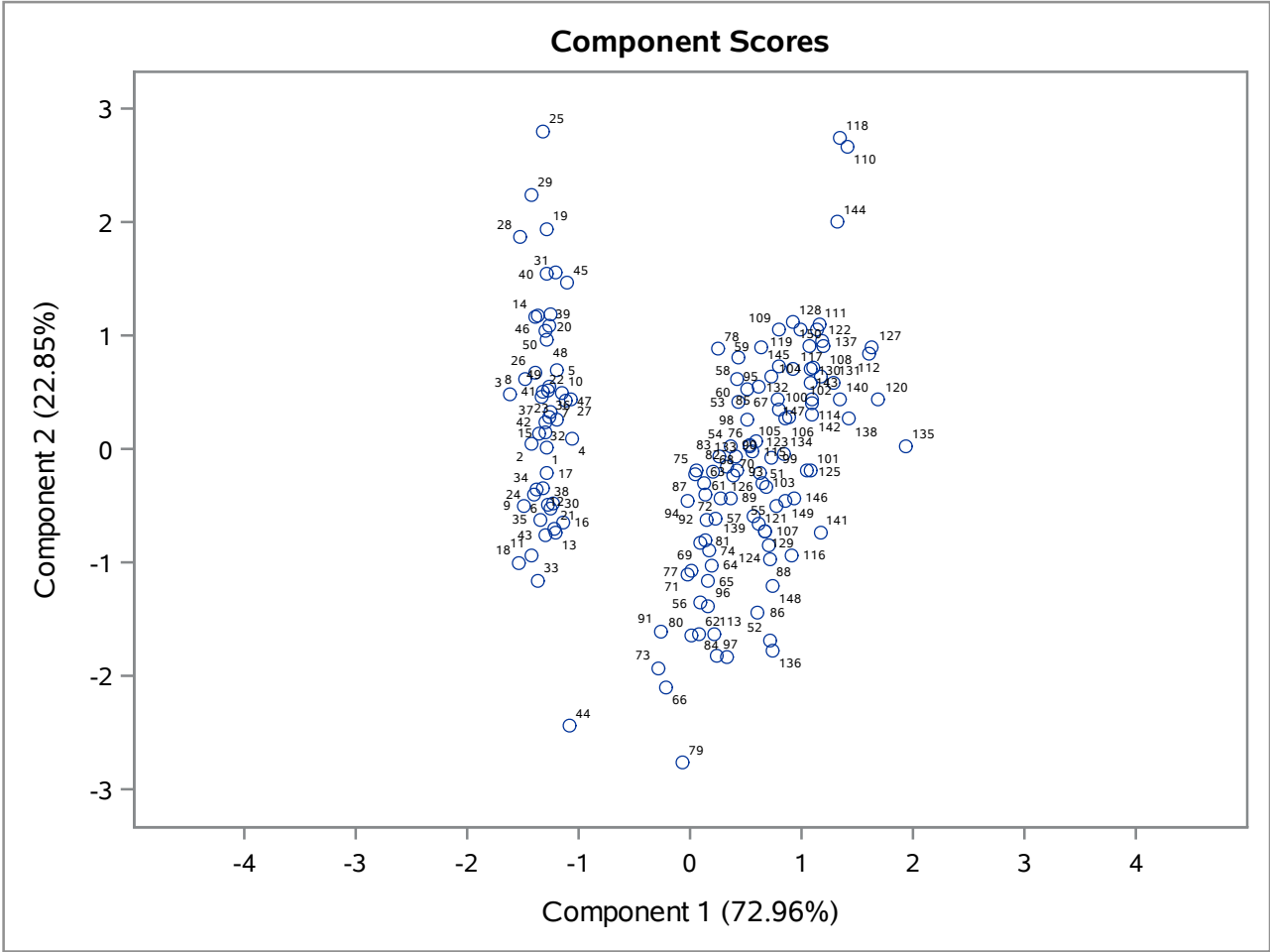
The PRINCOMP Procedure



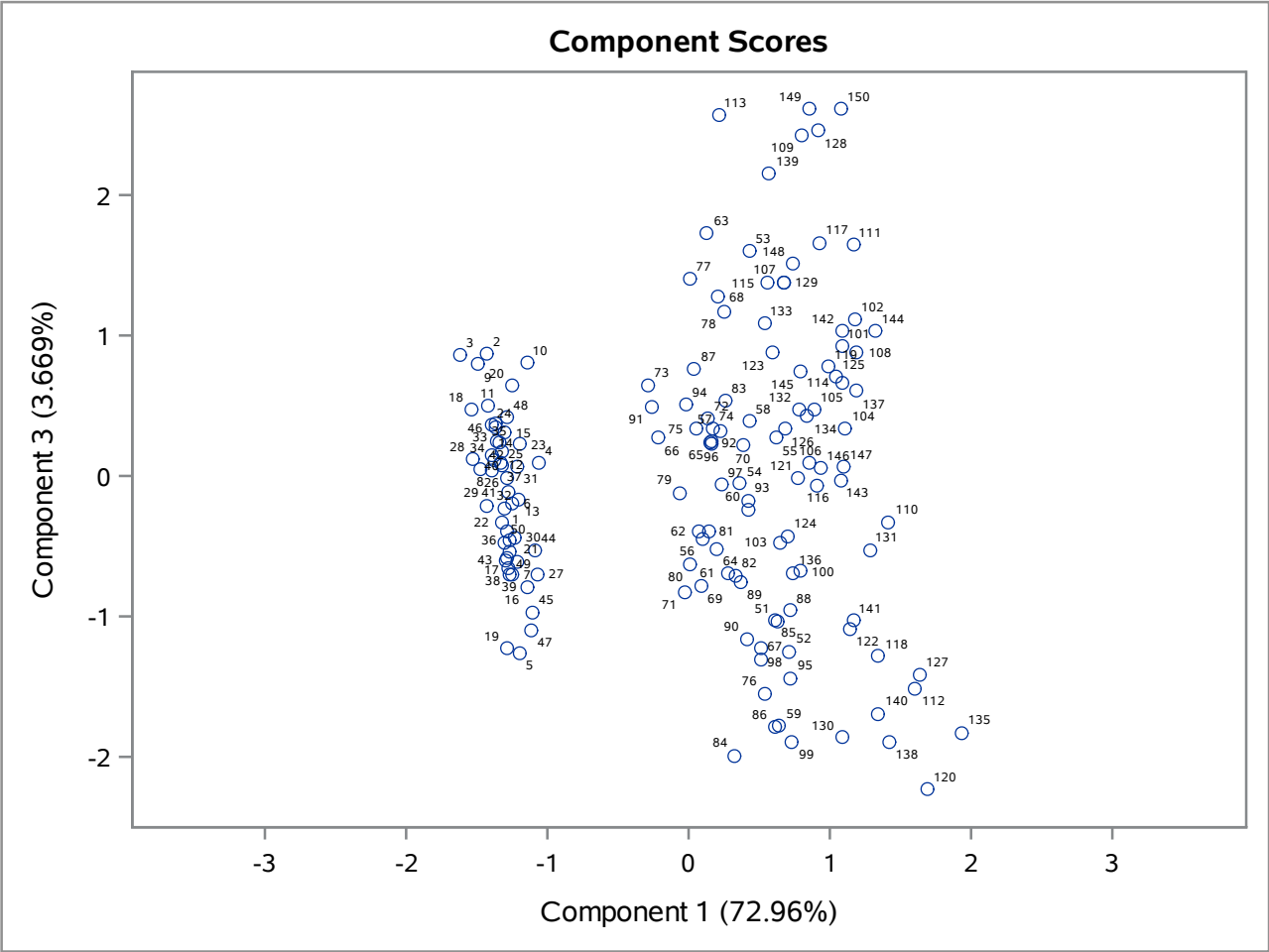
The PRINCOMP Procedure



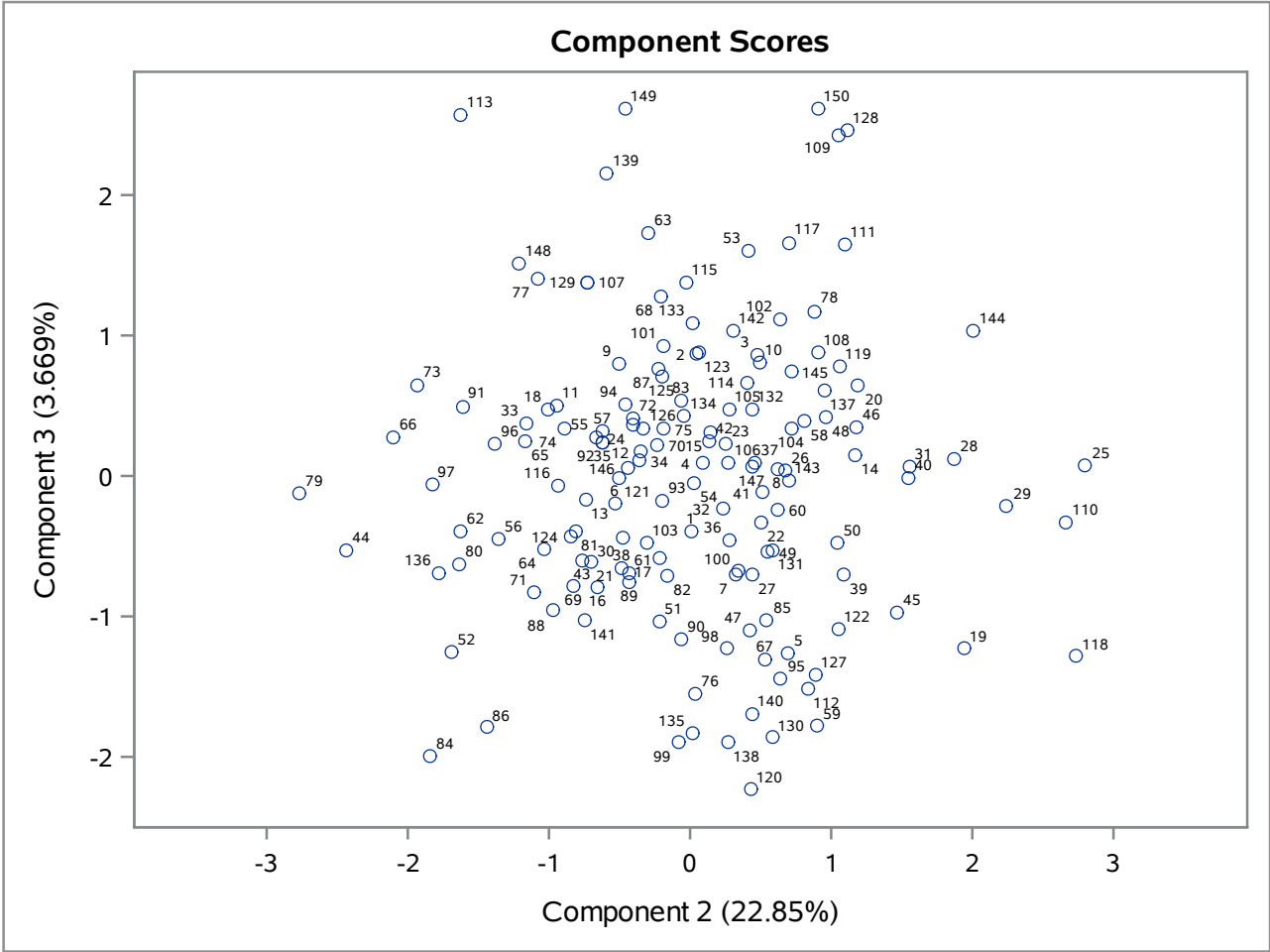
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