

# Chapter 22

## Data Sets

## 22.1 Elytra Length

Elytra length of male and female clerid beetles (*Thanasimus dubius*) including a sample SAS data step. Data drawn from Reeve et al. (2003).

---

```
data elytra;
  input sex $ length;
  datalines;
M 4.9
F 5.2
M 4.9
F 4.2
F 5.7
M 4.6
M 3.8
F 5.4
F 4.0
F 4.5
M 4.9
F 5.2
M 4.9
F 4.2
F 5.7
M 4.6
M 3.8
F 5.4
F 4.0
F 4.5
F 5.2
F 4.9
M 5.0
M 4.4
M 5.0
M 5.0
M 4.9
F 4.5
F 4.5
M 5.1
F 5.5
M 4.8
F 4.9
M 4.8
M 4.5
```

22.1. ELYTRA LENGTH

739

M	4.5
M	4.4
M	5.2
M	4.1
F	5.0
M	4.4
F	4.9
M	4.7
M	4.4
F	4.8
F	4.5
M	4.0
M	3.4
F	5.5
M	4.7
M	4.8
F	4.8
F	3.7
M	5.3
M	4.6
F	4.8
M	4.5
M	5.0
M	4.4
F	4.6
M	4.4
M	4.9
F	5.3
F	5.0
F	4.7
F	5.2
M	5.0
M	5.0
M	4.8
M	5.8
F	5.7
F	5.2
M	4.9
F	5.1
F	5.3
F	5.3
F	5.9
F	5.3
M	4.5
F	5.2

M 5.1  
F 4.6  
M 4.8  
M 3.5  
F 4.6  
F 5.3  
M 5.2  
F 4.8  
M 5.1  
M 5.2  
M 4.9  
M 5.3  
M 5.2  
F 4.9  
F 5.6  
M 5.0  
M 5.0  
F 5.1  
M 5.1  
F 5.5  
M 5.1  
F 4.8  
F 4.9  
F 5.0  
M 4.9  
M 5.0  
F 5.0  
M 4.9  
M 4.8  
F 5.2  
F 4.8  
M 4.7  
F 5.1  
M 4.5  
M 5.0  
F 5.4  
F 4.6  
M 4.0  
M 4.2  
F 5.2  
F 4.6  
M 5.0  
M 3.7  
M 4.6  
M 4.0

22.1. ELYTRA LENGTH

741

```
M 5.1
F 4.4
M 4.8
M 4.6
F 3.7
;
run;
```

---

## 22.2 Development Time

Development times for the clerid beetle *Thanasimus dubius* The variables `time_pp` and `time_adult` are the development time from the larval to the prepupal stage, and the prepupal to the adult stage, respectively (Reeve et al. 2003).

---

```
data devel_time;
  input time_pp time_adult;
  datalines;
34 65
31 48
29 .
30 55
32 62
32 47
37 44
34 53
31 .
37 53
32 .
31 42
29 .
35 .
39 .
34 43
32 .
34 .
34 113
32 47
32 100
41 .
32 49
29 .
32 53
39 .
39 84
35 .
32 .
35 74
36 43
31 50
34 .
```

35 44  
35 116  
34 .  
34 .  
37 58  
36 101  
32 67  
34 68  
34 61  
28 66  
31 84  
30 68  
28 106  
28 42  
31 58  
31 42  
28 68  
32 55  
32 .  
30 101  
30 99  
39 43  
30 80  
28 52  
27 50  
28 110  
28 42  
30 .  
28 66  
28 147  
27 .  
37 135  
30 119  
29 113  
30 103  
30 95  
27 87  
29 89  
33 .  
27 76  
27 .  
30 .  
30 49  
30 81  
29 85

```
27 .
31 104
27 73
27 110
27 .
31 99
31 55
31 59
27 .
30 93
27 .
28 84
28 93
29 .
29 108
31 103
33 .
29 92
;
run;
```

---

## 22.3 Plant Biomass

Effect of nitrogen heterogeneity, nitrogen availability, and water availability on the total biomass of grassland plants grown in microcosms (Maestre & Reynolds 2007).

---

```
data maestre;
  input nitrohet $ nitrogen water biomass;
  datalines;
N 40 125 4.372
N 40 125 4.482
N 40 125 4.221
N 40 125 3.977
N 40 250 7.400
N 40 250 8.027
N 40 250 7.883
N 40 250 7.769
N 40 375 7.226
N 40 375 8.126
N 40 375 6.840
N 40 375 7.901
N 80 125 5.140
N 80 125 3.913
N 80 125 4.669
N 80 125 4.306
N 80 250 9.099
N 80 250 9.711
N 80 250 9.123
N 80 250 9.709
N 80 375 10.701
N 80 375 11.552
N 80 375 11.356
N 80 375 9.759
N 120 125 5.021
N 120 125 4.970
N 120 125 5.055
N 120 125 4.862
N 120 250 9.029
N 120 250 10.791
N 120 250 9.115
N 120 250 10.319
N 120 375 12.189
N 120 375 14.381
```

```
N 120 375 13.153
N 120 375 14.066
Y 40 125 5.458
Y 40 125 5.017
Y 40 125 5.479
Y 40 125 5.714
Y 40 250 8.972
Y 40 250 9.234
Y 40 250 8.032
Y 40 250 8.372
Y 40 375 9.464
Y 40 375 9.563
Y 40 375 9.385
Y 40 375 8.226
Y 80 125 6.616
Y 80 125 6.909
Y 80 125 6.851
Y 80 125 6.098
Y 80 250 10.792
Y 80 250 10.164
Y 80 250 10.947
Y 80 250 9.582
Y 80 375 14.936
Y 80 375 13.607
Y 80 375 14.231
Y 80 375 12.038
Y 120 125 7.389
Y 120 125 6.683
Y 120 125 7.759
Y 120 125 6.752
Y 120 250 10.731
Y 120 250 12.640
Y 120 250 10.350
Y 120 250 11.550
Y 120 375 14.697
Y 120 375 17.826
Y 120 375 14.711
Y 120 375 13.614
;
run;
```

---

## 22.4 *Anagrus* fecundity

Fecundity for the parasitoid *Anagrus delicatus* collected from different sites, with 14 isolines per site and eight individual wasps per isoline. The data were simulated from the results presented in Cronin and Strong (1996).

---

```
data anagrus;
  input site isoline wasp eggs;
  datalines;
1  1  1  37
1  1  2  41
1  1  3  46
1  1  4  44
1  1  5  43
1  1  6  41
1  1  7  38
1  1  8  37
1  2  1  37
1  2  2  28
1  2  3  34
1  2  4  37
1  2  5  35
1  2  6  39
1  2  7  36
1  2  8  29
1  3  1  35
1  3  2  37
1  3  3  40
1  3  4  39
1  3  5  37
1  3  6  44
1  3  7  35
1  3  8  38
1  4  1  28
1  4  2  36
1  4  3  31
1  4  4  27
1  4  5  36
1  4  6  33
1  4  7  31
1  4  8  35
1  5  1  34
1  5  2  35
```

1	5	3	30
1	5	4	39
1	5	5	42
1	5	6	39
1	5	7	38
1	5	8	32
1	6	1	30
1	6	2	32
1	6	3	35
1	6	4	35
1	6	5	32
1	6	6	31
1	6	7	34
1	6	8	30
1	7	1	30
1	7	2	36
1	7	3	37
1	7	4	30
1	7	5	41
1	7	6	35
1	7	7	34
1	7	8	37
1	8	1	25
1	8	2	31
1	8	3	24
1	8	4	26
1	8	5	30
1	8	6	31
1	8	7	25
1	8	8	24
1	9	1	34
1	9	2	35
1	9	3	29
1	9	4	34
1	9	5	34
1	9	6	40
1	9	7	37
1	9	8	37
1	10	1	38
1	10	2	30
1	10	3	33
1	10	4	32
1	10	5	33
1	10	6	34
1	10	7	35

1	10	8	41
1	11	1	36
1	11	2	33
1	11	3	36
1	11	4	34
1	11	5	37
1	11	6	41
1	11	7	37
1	11	8	31
1	12	1	35
1	12	2	36
1	12	3	35
1	12	4	37
1	12	5	40
1	12	6	34
1	12	7	29
1	12	8	42
1	13	1	33
1	13	2	39
1	13	3	33
1	13	4	37
1	13	5	28
1	13	6	35
1	13	7	34
1	13	8	38
1	14	1	35
1	14	2	33
1	14	3	25
1	14	4	29
1	14	5	29
1	14	6	35
1	14	7	33
1	14	8	29
2	1	1	26
2	1	2	39
2	1	3	36
2	1	4	27
2	1	5	25
2	1	6	31
2	1	7	30
2	1	8	25
2	2	1	42
2	2	2	46
2	2	3	46
2	2	4	42

2	2	5	43
2	2	6	36
2	2	7	36
2	2	8	41
2	3	1	38
2	3	2	36
2	3	3	35
2	3	4	31
2	3	5	36
2	3	6	32
2	3	7	29
2	3	8	34
2	4	1	28
2	4	2	36
2	4	3	33
2	4	4	32
2	4	5	27
2	4	6	31
2	4	7	30
2	4	8	32
2	5	1	30
2	5	2	35
2	5	3	32
2	5	4	31
2	5	5	36
2	5	6	34
2	5	7	29
2	5	8	36
2	6	1	28
2	6	2	34
2	6	3	34
2	6	4	35
2	6	5	32
2	6	6	31
2	6	7	24
2	6	8	31
2	7	1	35
2	7	2	34
2	7	3	44
2	7	4	34
2	7	5	35
2	7	6	36
2	7	7	32
2	7	8	30
2	8	1	37

2	8	2	32
2	8	3	33
2	8	4	39
2	8	5	30
2	8	6	31
2	8	7	32
2	8	8	34
2	9	1	41
2	9	2	41
2	9	3	43
2	9	4	36
2	9	5	43
2	9	6	42
2	9	7	42
2	9	8	37
2	10	1	34
2	10	2	30
2	10	3	35
2	10	4	27
2	10	5	30
2	10	6	22
2	10	7	31
2	10	8	31
2	11	1	34
2	11	2	36
2	11	3	38
2	11	4	36
2	11	5	34
2	11	6	33
2	11	7	35
2	11	8	29
2	12	1	28
2	12	2	29
2	12	3	27
2	12	4	36
2	12	5	33
2	12	6	32
2	12	7	34
2	12	8	32
2	13	1	40
2	13	2	39
2	13	3	39
2	13	4	34
2	13	5	32
2	13	6	42

2	13	7	36
2	13	8	39
2	14	1	38
2	14	2	42
2	14	3	37
2	14	4	37
2	14	5	34
2	14	6	33
2	14	7	43
2	14	8	34
3	1	1	30
3	1	2	35
3	1	3	36
3	1	4	37
3	1	5	29
3	1	6	27
3	1	7	39
3	1	8	38
3	2	1	30
3	2	2	37
3	2	3	30
3	2	4	31
3	2	5	27
3	2	6	31
3	2	7	36
3	2	8	40
3	3	1	27
3	3	2	33
3	3	3	31
3	3	4	32
3	3	5	34
3	3	6	31
3	3	7	31
3	3	8	31
3	4	1	26
3	4	2	27
3	4	3	37
3	4	4	30
3	4	5	29
3	4	6	35
3	4	7	34
3	4	8	31
3	5	1	36
3	5	2	32
3	5	3	34

3	5	4	37
3	5	5	32
3	5	6	34
3	5	7	33
3	5	8	32
3	6	1	33
3	6	2	40
3	6	3	34
3	6	4	38
3	6	5	36
3	6	6	35
3	6	7	41
3	6	8	34
3	7	1	31
3	7	2	33
3	7	3	31
3	7	4	34
3	7	5	29
3	7	6	33
3	7	7	28
3	7	8	33
3	8	1	22
3	8	2	25
3	8	3	29
3	8	4	24
3	8	5	24
3	8	6	26
3	8	7	25
3	8	8	21
3	9	1	32
3	9	2	31
3	9	3	28
3	9	4	28
3	9	5	35
3	9	6	34
3	9	7	33
3	9	8	31
3	10	1	31
3	10	2	32
3	10	3	29
3	10	4	30
3	10	5	28
3	10	6	31
3	10	7	28
3	10	8	36

```
3 11 1 32
3 11 2 31
3 11 3 34
3 11 4 35
3 11 5 35
3 11 6 31
3 11 7 41
3 11 8 34
3 12 1 28
3 12 2 27
3 12 3 27
3 12 4 27
3 12 5 27
3 12 6 30
3 12 7 28
3 12 8 28
3 13 1 36
3 13 2 39
3 13 3 36
3 13 4 30
3 13 5 37
3 13 6 32
3 13 7 38
3 13 8 39
3 14 1 32
3 14 2 34
3 14 3 41
3 14 4 33
3 14 5 35
3 14 6 35
3 14 7 34
3 14 8 31
;
run;
```

---

## 22.5 Fitness of *T. dubius*

Fitness of adult *T. dubius*, a bark beetle predator, reared on an artificial diet as larvae vs. wild individuals collected from the field (Reeve et al. 2003). The adults were fed either *Ips grandicollis* or cowpea weevils.

---

```

data fitness;
  input eggs longevity length treat $;
  datalines;
290    78    5.7    DietIG
  99    40    5.2    DietIG
340    70    5.5    DietIG
271    67    4.8    DietIG
200    84    5.2    DietIG
405    80    5.2    DietIG
178    80    5.1    DietIG
  48    23    5.0    DietIG
146    62    4.8    DietIG
184    82    4.9    DietIG
  66    67    4.6    DietCPW
  93    45    5.0    DietCPW
   9    49    5.4    DietCPW
404   121    5.4    DietCPW
244   114    5.1    DietCPW
195    72    4.9    DietCPW
343   126    5.2    DietCPW
516   138    5.0    DietCPW
215   108    4.6    DietCPW
412   156    5.6    DietCPW
167    79    4.8    DietCPW
316   117    5.2    DietCPW
334   127    5.3    DietCPW
  62   221    4.7    WildCPW
290   180    5.0    WildCPW
488   175    5.8    WildCPW
336   177    5.2    WildCPW
337   164    5.8    WildCPW
230    93    5.0    WildCPW
381   155    5.3    WildCPW
192   152    5.5    WildCPW
186   143    5.3    WildCPW
467   140    5.2    WildCPW
  59    42    4.9    WildCPW

```

```
323 138 5.7 WildCPW
291 117 4.9 WildCPW
164 112 5.3 WildCPW
142 112 5.3 WildCPW
269 110 5.0 WildCPW
329 91 5.4 WildCPW
235 84 5.0 WildCPW
;
run;
```

---

## 22.6 *Iris* flower measurements

Sepal and petal measurements for *I. setosa* (Fisher 1936).

---

```
data iris;
  input seplen sepwid petlen petwid;
  datalines;
5.1 3.5 1.4 0.2
4.9 3.0 1.4 0.2
4.7 3.2 1.3 0.2
4.6 3.1 1.5 0.2
5.0 3.6 1.4 0.2
5.4 3.9 1.7 0.4
4.6 3.4 1.4 0.3
5.0 3.4 1.5 0.2
4.4 2.9 1.4 0.2
4.9 3.1 1.5 0.1
5.4 3.7 1.5 0.2
4.8 3.4 1.6 0.2
4.8 3.0 1.4 0.1
4.3 3.0 1.1 0.1
5.8 4.0 1.2 0.2
5.7 4.4 1.5 0.4
5.4 3.9 1.3 0.4
5.1 3.5 1.4 0.3
5.7 3.8 1.7 0.3
5.1 3.8 1.5 0.3
5.4 3.4 1.7 0.2
5.1 3.7 1.5 0.4
4.6 3.6 1.0 0.2
5.1 3.3 1.7 0.5
4.8 3.4 1.9 0.2
5.0 3.0 1.6 0.2
5.0 3.4 1.6 0.4
5.2 3.5 1.5 0.2
5.2 3.4 1.4 0.2
4.7 3.2 1.6 0.2
4.8 3.1 1.6 0.2
5.4 3.4 1.5 0.4
5.2 4.1 1.5 0.1
5.5 4.2 1.4 0.2
4.9 3.1 1.5 0.2
5.0 3.2 1.2 0.2
5.5 3.5 1.3 0.2
```

```
4.9 3.6 1.4 0.1
4.4 3.0 1.3 0.2
5.1 3.4 1.5 0.2
5.0 3.5 1.3 0.3
4.5 2.3 1.3 0.3
4.4 3.2 1.3 0.2
5.0 3.5 1.6 0.6
5.1 3.8 1.9 0.4
4.8 3.0 1.4 0.3
5.1 3.8 1.6 0.2
4.6 3.2 1.4 0.2
5.3 3.7 1.5 0.2
5.0 3.3 1.4 0.2
;
run;
```

---

## 22.7 References

- Cronin, J. T. & Strong, D. R. (1996) Genetics of oviposition success of a thelytokous fairyfly parasitoid, *Anagrus delicatus*. *Heredity* 76: 43-54.
- Fisher, R. A. (1936) The use of multiple measurements in taxonomic problems. *Annals of Eugenics* 7: 179-188.
- Maestre, F. T. & Reynolds, J. F. (2007) Amount or pattern? Grassland responses to the heterogeneity and availability of two key resources. *Ecology* 88: 501-511.
- Reeve, J. D., Rojas, M. G. & Morales-Ramos, J. A. (2003) Artificial diet and rearing methods for *Thanasimus dubius* (Coleoptera: Cleridae), a predator of bark beetles (Coleoptera: Scolytidae). *Biological Control* 27: 315-322.

