

# Chapter 21

## Data Sets

## 21.1 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
```

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695

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

21.1. ELYTRA LENGTH

697

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

---

## 21.2 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;
```

---



## 21.3 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;
```

---

## 21.4 *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;
```

---

## 21.5 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;
```

---

## 21.6 *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;
```

---

## 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.

