

Appendix

A: Data collection

Data swimming

year	sex	style	speed
1988	1	50	2.25835609
1992	1	50	2.28206301
1996	1	50	2.25937653
2000	1	50	2.27479529
1928	1	100	1.70648468
1932	1	100	1.71821308
1936	1	100	1.73611116
1948	1	100	1.74520075
1952	1	100	1.74216020
1956	1	100	1.80505407
1960	1	100	1.81159413
1964	1	100	1.87265909
1968	1	100	1.91570878
1972	1	100	1.95236230
1976	1	100	2.00040007
1980	1	100	1.98412693
1984	1	100	2.00803208
1988	1	100	2.05634379
1992	1	100	2.03998375
1996	1	100	2.05170274
2000	1	100	2.07039332
1928	1	110	1.46627569
1932	1	110	1.45772600
1936	1	110	1.51745069
1948	1	110	1.50602400
...
2000	2	800	1.60105669

Data running

year	sex	style	speed
1928	1	1	9.259259224
1932	1	1	9.708737373
1936	1	1	9.708737373
1948	1	1	9.708737373
1952	1	1	9.615385056
1956	1	1	9.523809433
1960	1	1	9.803921700
1964	1	1	10.00000000
1968	1	1	10.10101032
1972	1	1	9.861932755
1976	1	1	9.940357208
1980	1	1	9.756097794
1984	1	1	10.01000977
1988	1	1	10.08064461
1992	1	1	10.04016018
1996	1	1	10.06036282
2000	1	1	10.13171196
1928	1	2	7.432432175
1932	1	2	7.534246445
1936	1	2	7.746479034
1948	1	2	7.913669109
1952	1	2	8.029196739
1956	1	2	8.148148537
1960	1	2	7.971014500
1964	1	2	8.088234901
...
2000	2	1	6.887645245

Data Jumping

year	sex	event	distance
1928	1	1	1.94
1932	1	1	1.97
1936	1	1	2.03
1948	1	1	1.98
1952	1	1	2.04
1956	1	1	2.12
1960	1	1	2.16
1964	1	1	2.18
1968	1	1	2.24
1972	1	1	2.23
1976	1	1	2.25
1980	1	1	2.36
1984	1	1	2.35
1988	1	1	2.38
1992	1	1	2.34
1996	1	1	2.39
2000	1	1	2.35
1928	1	2	7.73
1932	1	2	7.64
1936	1	2	8.06
1948	1	2	7.82
1952	1	2	7.57
1956	1	2	7.83
1928	1	2	7.73
1932	1	2	7.64
1936	1	2	8.06
...
2000	2	6	15.2

Data Throwing

year	sex	event	distance
1928	1	1	15.87
1932	1	1	16.00
1936	1	1	16.20
1948	1	1	17.12
1952	1	1	17.41
1956	1	1	18.57
1960	1	1	19.68
1964	1	1	20.33
1968	1	1	20.54
1972	1	1	21.18
1976	1	1	21.05
1980	1	1	21.25
1984	1	1	21.26
1988	1	1	22.47
1992	1	1	21.70
1996	1	1	21.62
2000	1	1	21.29
1928	1	2	47.32
1932	1	2	49.49
1936	1	2	50.48
1948	1	2	52.78
1952	1	2	55.03
1956	1	2	56.36
1960	1	2	59.18
1964	1	2	61.00
1968	1	2	64.78
...
2000	2	3	68.91

B: Programming

MATLAB version 5 and Asp (McNeil, 1998) is compiled by MATLAB. This a suit of functions for graphing and analysis data. These programs are used with MATLAB, that is a software package, which runs under Microsoft Windows. The m-file programs for producing the results was fitted model to show adjust r-squares and coefficient.

% Program swimmen.m create Figure 4.1

```
getfile swimmen
setvar y=1 x=[2 5]
adjust ncat=18 font=8
adjust ncat=18 show=2
```

% Program swimm.m create Figure 4.2

```
getfile swimm
y = getnum;
y(:,1) = log(y(:,1))/log(10);
putnum(y)
fn = getfn;
fn{1} = 'log10(speed)';
putfn(fn)
setvar y=1 x=[2 5]
adjust ncat=18 font=8
adjust ncat=18 show=2
```

% Program swimw.m create Figure 4.3

```
getfile swimw
y = getnum;
y(:,1) = log(y(:,1))/log(10);
putnum(y)
fn = getfn;
fn{1} = 'log10(speed)';
putfn(fn)
setvar y=1 x=[2 5]
adjust ncat=18 font=8
adjust ncat=18 show=2
```

```
% Program runm.m create Figure 4.4
```

```
getfile runm  
y = getnum;  
y(:,1) = log(y(:,1))/log(10);  
putnum(y)  
fn = getfn;  
fn{1} = 'log10(speed)';  
putfn(fn)  
setvar y=1 x=[2 3]  
adjust ncat=18 font=8  
adjust ncat=18 show=2
```

```
% Program runm.m create Figure 4.5
```

```
getfile runw  
y = getnum;  
y(:,1) = log(y(:,1))/log(10);  
putnum(y)  
fn = getfn;  
fn{1} = 'log10(speed)';  
putfn(fn)  
setvar y=1 x=[2 3]  
adjust ncat=18 font=8  
adjust ncat=18 show=2
```

```
% Program jump.m create Figure 4.6
```

```
getfile jump  
setvar y=1 x=[3 2]  
adjust ncat=18 font=8  
adjust ncat=18 show=2
```

```
% Program throw.m create Figure 4.7
```

```
getfile swimmen  
setvar y=1 x=[2 5]  
adjust ncat=18 font=8  
adjust ncat=18 show=2
```