

Generalized Linear Model lab 1

1 Parameter Estimation

1.1 Input data

```
> season<-c(1,2,3,4,5,6,7,8,9,10,11,12,13)
> season

[1] 1 2 3 4 5 6 7 8 9 10 11 12 13

> cyclone<-c(6,5,4,6,6,3,12,7,4,2,6,7,4)
> cyclone

[1] 6 5 4 6 6 3 12 7 4 2 6 7 4
```

1.2 Calculus

```
> ybar<-mean(cyclone)
> ybar

[1] 5.538462
```

1.3 Numerical method

```
> index<-c(1:100)
> index

[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
[19] 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
[37] 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
[55] 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
[73] 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
[91] 91 92 93 94 95 96 97 98 99 100

> theta<-c(5,6)
> like<-0
> for(i in 1:2){
+   like[i]<-72*log(theta[i])-13*theta[i]
+ }
> for(j in 3:100){
+   n<-length(like)
+   n
+   sort(like)
+   sort(like)[n]
+   sort(like)[n-1]
+   for(i in 1:n){
```

```

+   if(like[i]==sort(like)[n-1]){
+     index[j]<-i
+   }
+ }
+ index
+ for(i in 1:n){
+   if(like[i]==sort(like)[n]){
+     index[j+1]<-i
+   }
+ }
+ theta[j]<-(theta[index[j]]+theta[index[j+1]])/2
+ like[j]<-72*log(theta[j])-13*theta[j]
+ if(abs(theta[j]-theta[j-1])<=0.005) break
+ }
> theta

[1] 5.000000 6.000000 5.500000 5.750000 5.625000 5.562500 5.531250 5.546875
[9] 5.539062 5.535156

> like

[1] 50.87953 51.00668 51.24186 51.19239 51.23491 51.24293 51.24355 51.24352
[9] 51.24361 51.24359

```