

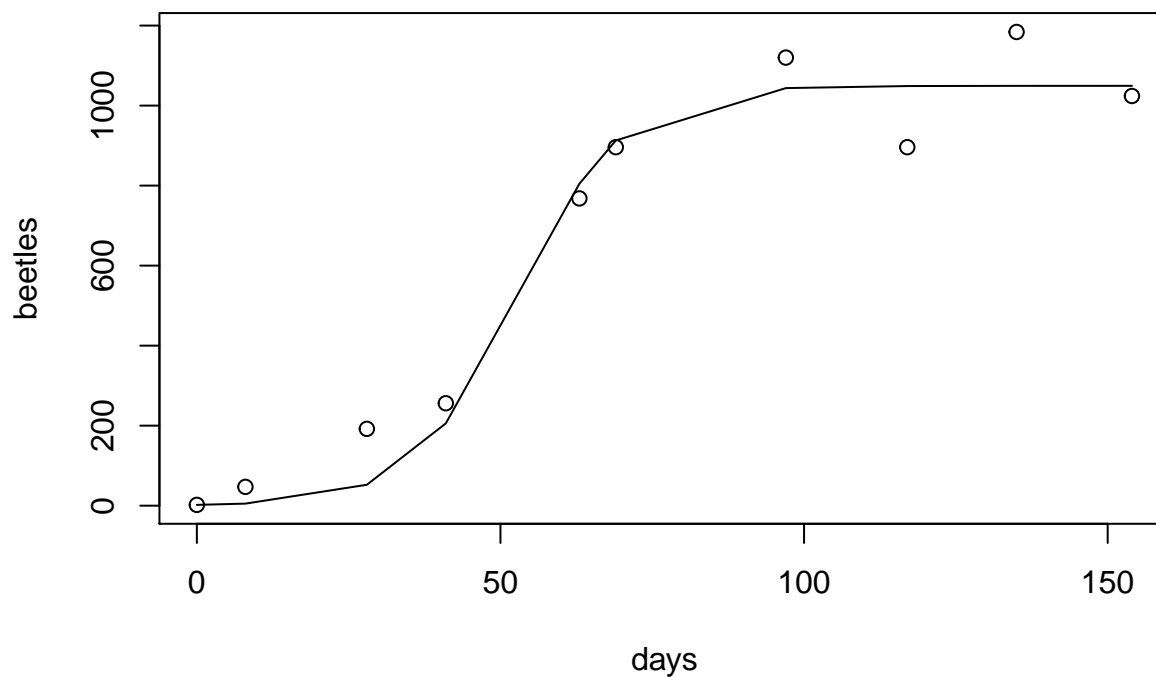
# HW2-Q3

*Xiao Cui*

2018/2/7

## Q3 a

```
##
## Formula: beetles ~ K * 2/(2 + (K - 2) * exp((-R) * days))
##
## Parameters:
##   Estimate Std. Error t value Pr(>|t|)
## K 1.049e+03  4.717e+01   22.25 1.76e-08 ***
## R 1.183e-01  6.533e-03   18.10 8.90e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 95.8 on 8 degrees of freedom
##
## Number of iterations to convergence: 8
## Achieved convergence tolerance: 2.487e-06
```

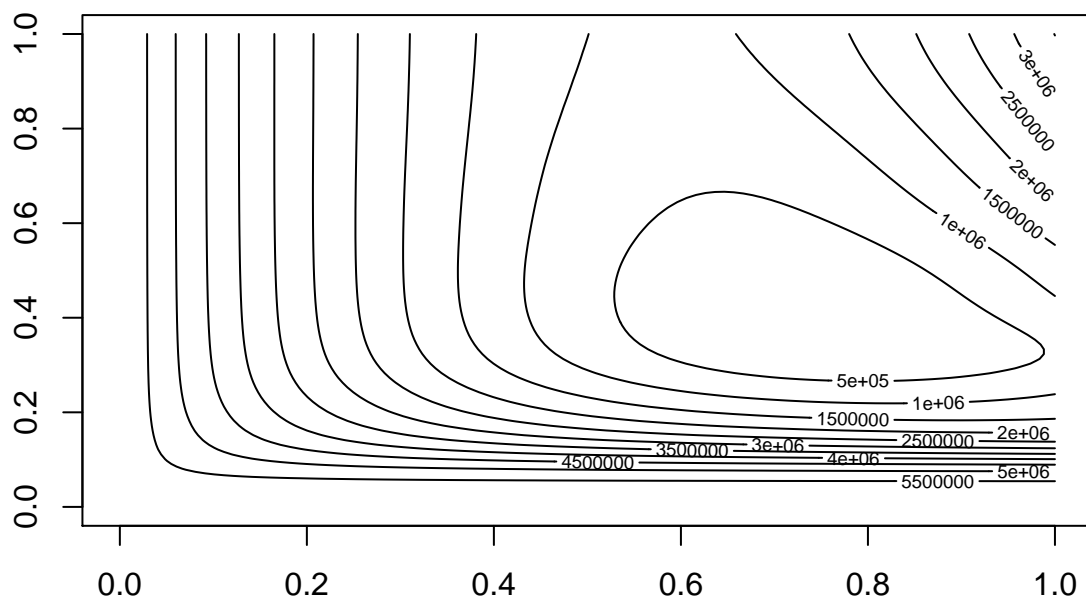


```
## [1] 0.983864
```

The graph shows that the model suits the value well

The correlation coefficient between real value and the estimated value is as high as 0.9836

Q3 b



Q3 C

```
## [1] 2.031806
## $minimum
## [1] 9.790127
##
## $estimate
## [1] 820.3815696 0.1926394 0.6440836
##
## $gradient
## [1] 1.138072e-08 2.900258e-05 -2.716050e-06
##
## $hessian
```

```

##           [,1]           [,2]           [,3]
## [1,] 2.389705e-05 0.05442387 -3.048716e-06
## [2,] 5.442387e-02 373.52578204 -5.767475e-02
## [3,] -3.048716e-06 -0.05767475 4.817365e+01
##
## $code
## [1] 2
##
## $iterations
## [1] 38

## [1] 820.3815696 0.1926394 0.6440836

##           [,1]           [,2]           [,3]
## [1,] 2.389705e-05 0.05442387 -3.048716e-06
## [2,] 5.442387e-02 373.52578204 -5.767475e-02
## [3,] -3.048716e-06 -0.05767475 4.817365e+01
##
## [1] 6.262789e+04 4.006745e-03 2.075824e-02

```