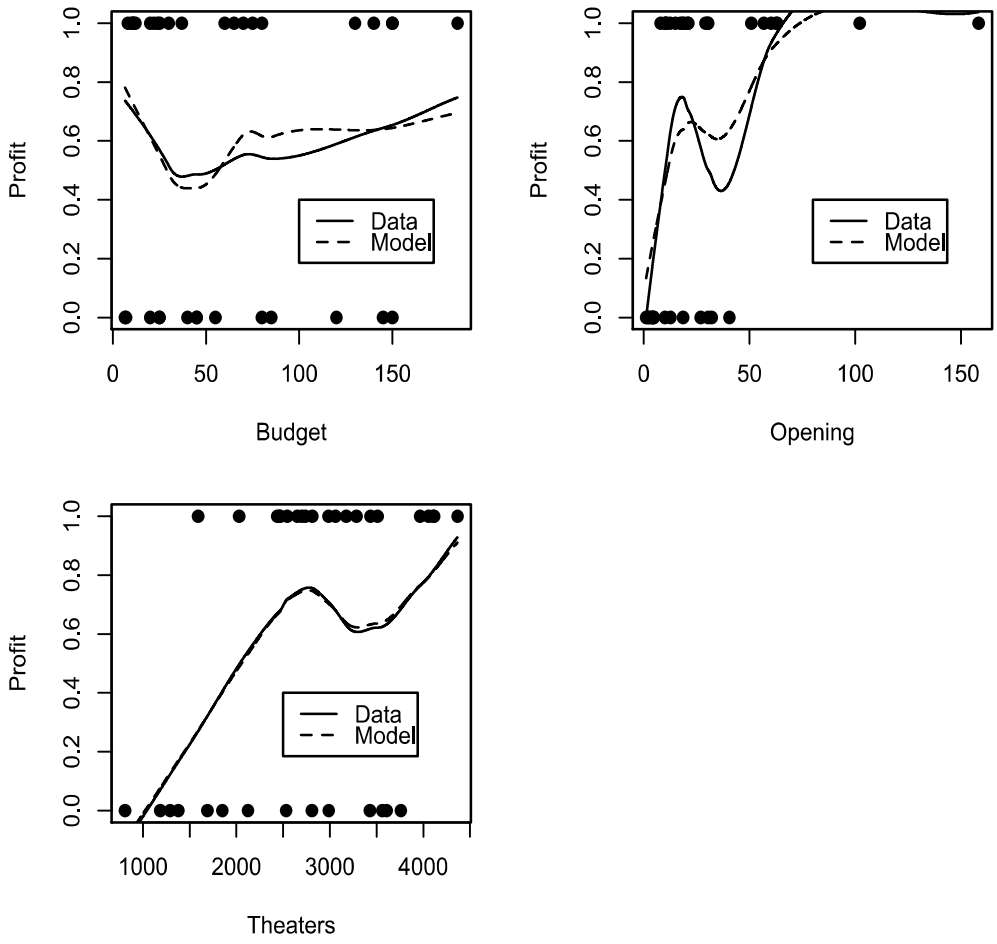
Appendix

Movie Profits

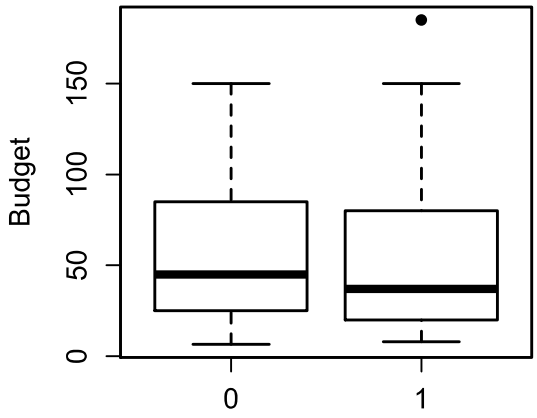
Model 1: Marginal Model Plots

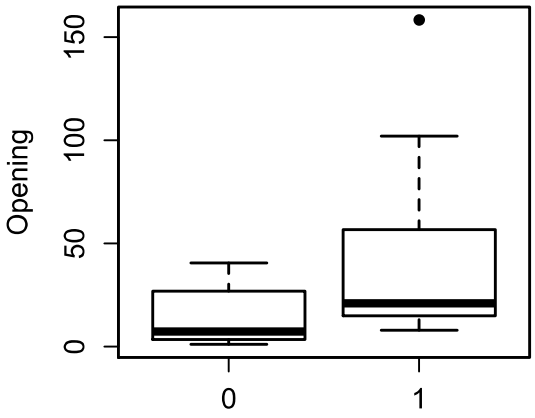


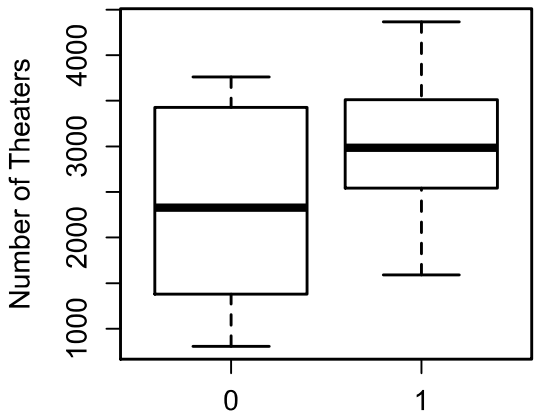
Movie Profits
Model 1 Output

```
Call:
glm(formula = Profit ~ Budget + Opening + Theaters, family = binomial(),
    data = movies)

Coefficients:
             Estimate Std. Error z value Pr(>|z|)
(Intercept) -3.871589   3.351796  -1.155   0.2481
Budget      -0.159113   0.067706  -2.350   0.0188 *
Opening      0.346399   0.144127   2.403   0.0162 *
Theaters     0.002066   0.001734   1.192   0.2334
```

Boxplots

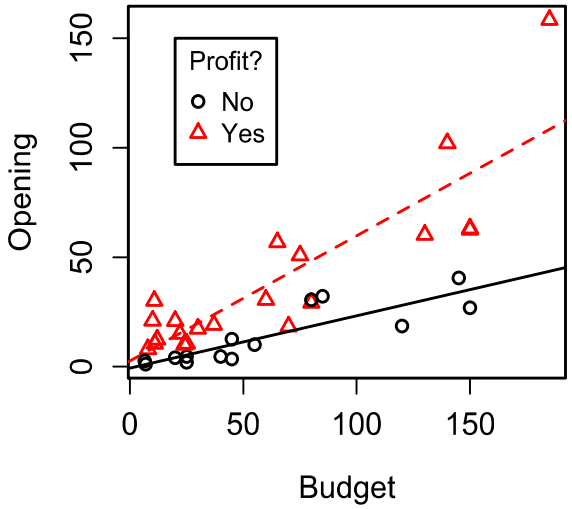


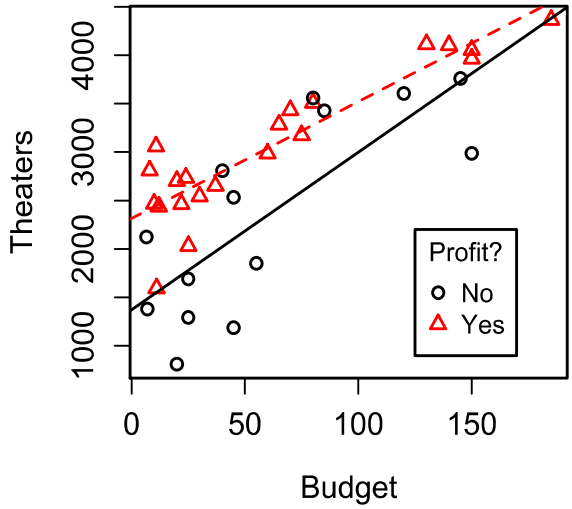


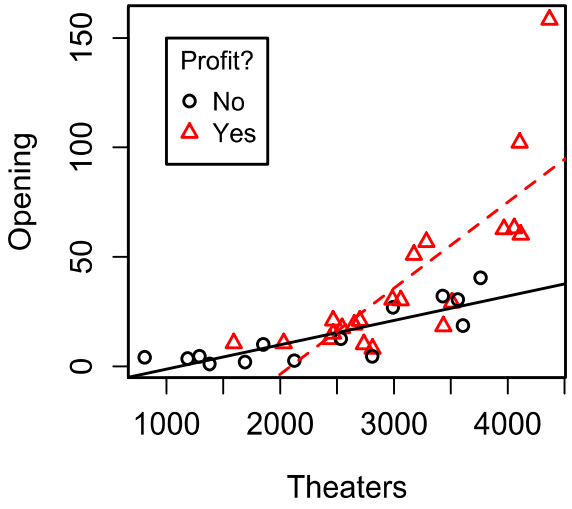


Movie Profits
Box-Cox Output

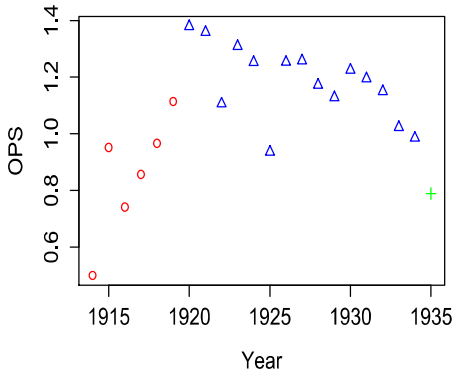
```
bcPower Transformations to Multinormality
          Est.Power Std.Err. Wald Lower Bound Wald Upper Bound
Budget       0.4320   0.1694           0.0999           0.7640
Opening      0.2476   0.0943           0.0628           0.4324
Theaters     1.9811   0.3765           1.2432           2.7191

Likelihood ratio tests about transformation parameters
                                      LRT df         pval
LR test, lambda = (0 0 0)       33.6043702  3 2.401223e-07
LR test, lambda = (1 1 1)       74.9983507  3 3.330669e-16
LR test, lambda = (0.5 0.33 2)   0.9645658  3 8.098251e-01
```







Babe Ruth


OPS
0.6
0.8
1.0
1.2
1.4
1915
1920
1925
1930
1935
Year

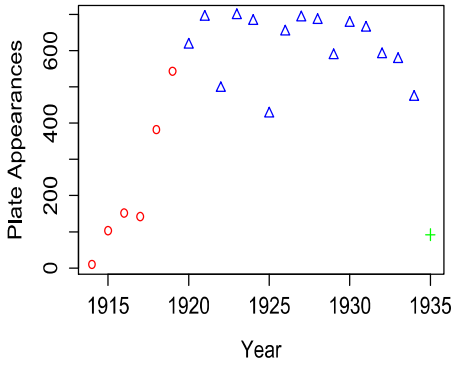
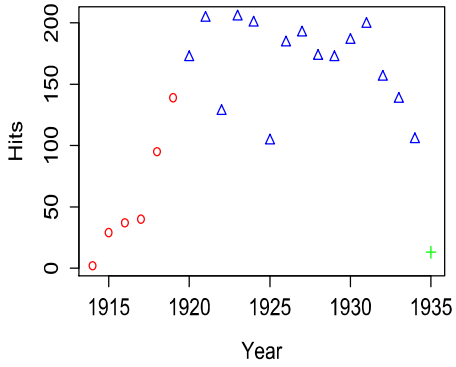
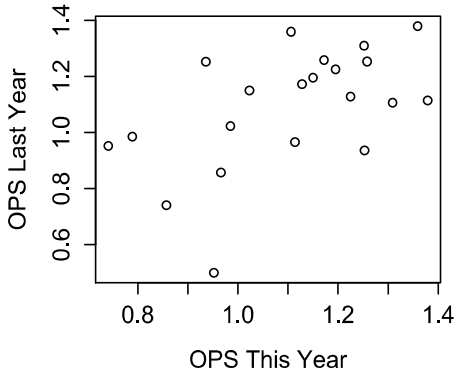
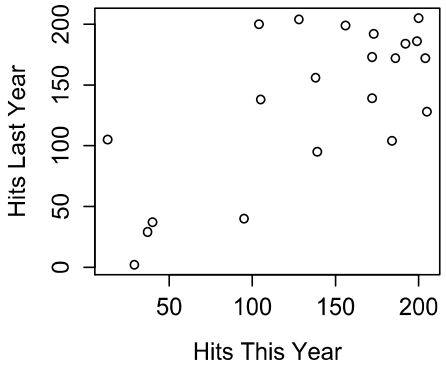


Plate Appearances
0
200
400
600
1915
1920
1925
1930
1935
Year


Hits
0
50
100
150
200
1915
1920
1925
1930
1935
Year


OPS Last Year
0.6
0.8
1.0
1.2
1.4
0.8
1.0
1.2
1.4
OPS This Year


Hits Last Year
0
50
100
150
200
50
100
150
200
Hits This Year

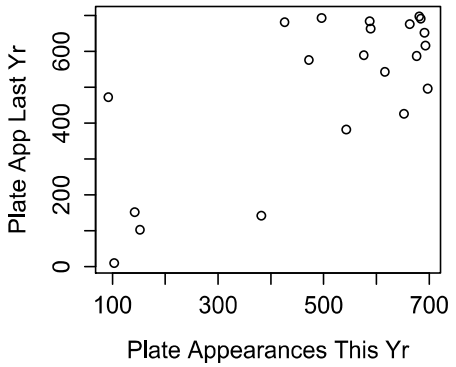
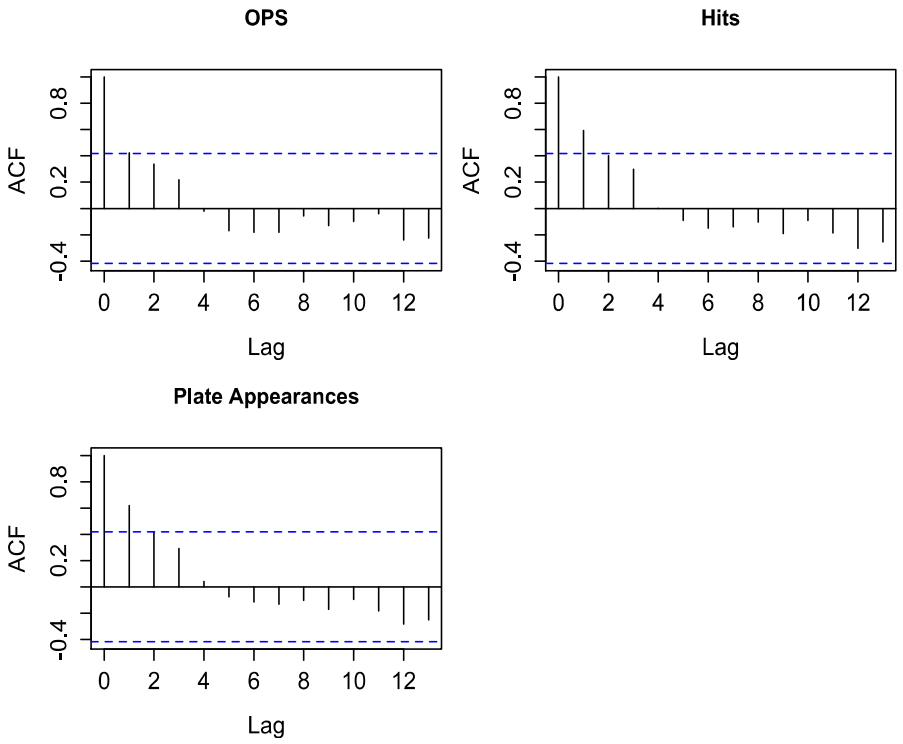
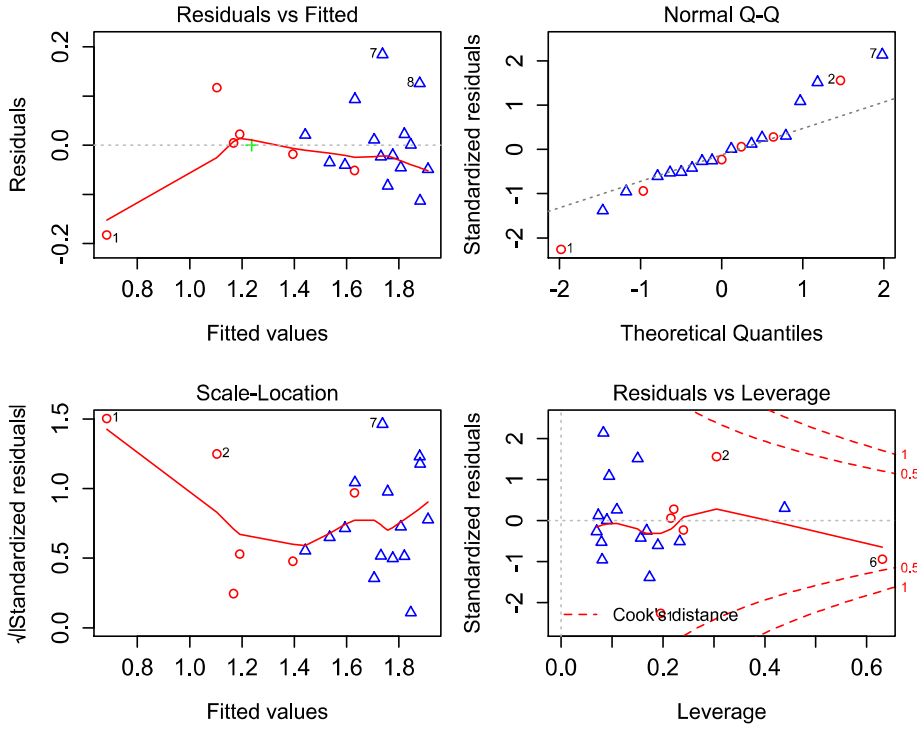


Plate App Last Yr
0
200
400
600
100
300
500
700
Plate Appearances This Yr

Babe Ruth



Generalized Least Squares Model with errors AR(1):



Babe Ruth
Model transformation code:

```
m2g <- gls(OPS ~ PA + Tm + H, correlation=corAR1(form = ~Year), method="ML")

rho <- -0.367068
x <- model.matrix(m1)
iden <- diag(n)
Sigma <- rho^abs(row(iden)-col(iden))
sm <- chol(Sigma)
smi <- solve(t(sm))
xstar <- smi %*% x
ystar <- smi %*% OPS
m1tls <- lm(ystar ~ xstar - 1)
```