

# Homework 4

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## Problem 1

(1)

Call:

```
glm(formula = seiz ~ log(age) + log_base + treat, family = poisson(),
     data = seiz_total)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-6.0834	-2.0602	-0.4096	1.3963	8.1997

Coefficients:

	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	-1.02151	0.40354	-2.531	0.0114 *
log(age)	0.58778	0.10992	5.347	8.93e-08 ***
log_base	1.22522	0.03252	37.672	< 2e-16 ***
treat	-0.01759	0.04818	-0.365	0.7150

---

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for poisson family taken to be 1)

Null deviance: 2122.73 on 58 degrees of freedom  
Residual deviance: 556.39 on 55 degrees of freedom  
AIC: 847.66

Number of Fisher Scoring iterations: 5

```
Call:
glm(formula = seiz ~ log(age) + log_base + treat, family = quasipoisson(),
    data = seiz_total)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-6.0834	-2.0602	-0.4096	1.3963	8.1997

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-1.02151	1.34172	-0.761	0.450
log(age)	0.58778	0.36548	1.608	0.114
log_base	1.22522	0.10813	11.330	5.27e-16 ***
treat	-0.01759	0.16019	-0.110	0.913

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for quasipoisson family taken to be 11.05488)

Null deviance: 2122.73 on 58 degrees of freedom  
Residual deviance: 556.39 on 55 degrees of freedom  
AIC: NA

Number of Fisher Scoring iterations: 5

(Intercept)	log(age)	log_base	treat
0.162843551	0.012083084	0.001057737	0.002321266

(Intercept)	log(age)	log_base	treat
1.80021599	0.13357705	0.01169316	0.02566131

(Intercept)	log(age)	log_base	treat
11.05488	11.05488	11.05488	11.05488

(2)

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
-0.7954	0.4192	0.6188	0.6048	0.8249	1.5308

[1] 0.3079293

**(3)**

Bias = average of bootstrap - fitted coefficient

(Intercept)	log(age)	log_base	treat
-1.02151177	0.58777978	1.22521697	-0.01759081

	intercept_b	log_age_b	log_base_b	treat_b
1	0.0751251	0.01703814	-0.05740605	-0.07608804

**(4)**

*Log (Age)*

## **Problem 2**