

Logistic Regression

Assignment 2

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Question 1

Only the logit can be used to estimate the odds ratio for the model predictors. The loglog does not output a probability. If it did one would be able to deduce odds ration.

Question 2

If the Odds Ratio Confidence Interval of a predictor includes 1, it can be considered not significant.

Question 3

A person with kids has 2.35 greater odss of having an affair than a person without kids all other things constant.

Question 4

The odds of a very religious person having an affair are .27 times as great than that of an anti-religious person all other things constant.

Question 5

$$1/.28 = 3.57$$

A person who is very religious is 3.57 times as likely to not have an affair when compared to an anti-religious person all other things constant.

Question 6

$$\log(1.2409) = .22$$

Question 7

The Odds Ratio for *kids* should stay similar or the same because the male predictor is not significant (it's confidence interval includes 1) .

Question 8

There is .1981 decrease in the log odds of having Kyphosis for every increase in the start value of vertebrae level for patients who underwent surgery in this study.

Question 9

It is the value of intercept when all predictors are held to 0.

Question 10

```
oddsx1 = 82/157 = .522293
oddsx0 = 431/825 = .5224242
oddsxb = .522293/.5224242 = .9997489
oddsln = log(.9997489) = -.0002511315
```

```
> y <- c(0,0,1,1)
> x <- c(0,1,0,1)
> cnt <- c(825,157,431,82)
> mod1 <- glm(y~x, weights=cnt, family=binomial)
> summary(mod1)
```

Call:

```
glm(formula = y ~ x, family = binomial, weights = cnt)
```

Deviance Residuals:

1	2	3	4
-26.33	-11.49	30.36	13.25

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-0.6492753	0.0594330	-10.924	<2e-16 ***
x	-0.0002513	0.1486498	-0.002	0.999

```

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

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 1922.9  on 3  degrees of freedom
Residual deviance: 1922.9  on 2  degrees of freedom
AIC: 1926.9

Number of Fisher Scoring iterations: 4

```