

Logistic regression warmup

Total points 0/4 ?

Use the output, below, to answer the following questions:

Call:

```
glm(formula = observed ~ voc + year, family = binomial(), data = exp.m)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-1.9351	-0.8411	-0.4561	0.9493	1.8680

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	2.453203	0.622248	3.942	8.06e-05
voc	-0.037391	0.008199	-4.560	5.11e-06
year2006	-0.453862	0.516567	-0.879	0.3796
year2007	-1.111884	0.508269	-2.188	0.0287

✗ Estimate the probability of detection when voc=10, and year = 2006 (round to 2 decimal places)

83.6%

✗

Correct answer

0.84



Describe the effect of voc in terms of its effect on the odds of detection.

The log-odds of detection decrease by 0.034 for every one unit increase in voc (obstruction of vision)

Feedback

The odds of detection decreases by $\exp(-0.037391)$ for every 1 unit increase in visual obstruction (holding year constant).

Since there is no interaction between year and voc, we can say that the odds of detection decreases by the same amount in each of the 3 years.

✗ Consider two observations with voc = 0 (i.e., the moose is in the open), one in 2005 and one in 2007. What is difference in the log odds of detection between the 2 years (i.e., $\text{logit}(p)$ for year = 2005 - $\text{logit}(p)$ for year= 2007)? Round to 2 decimal places.

1.34

✗

Correct answer

1.11

✗ Repeat this calculation but using voc = 50 (i.e., 50%). I.e., what is difference in the log odds of detection between the 2 years (i.e., $\text{logit}(p)$ for year = 2005 - $\text{logit}(p)$ for year= 2007) when voc = 50? Round to 2 decimal places.

-1.11

✗

Correct answer

1.11



✗ Consider two observations with $\text{voc} = 0$ (i.e., the individual is in the open), one in 2005 and one in 2007. What is the difference in the estimated probability of detection (\hat{p} for year = 2005 - \hat{p} for year = 2007)? Round to 2 decimal places. 0/2

12.81%

✗

Correct answer

0.13

✗ Repeat this calculation, but now when $\text{voc} = 50$ (i.e., 50%). I.e., what is the difference in the estimated probability of detection (\hat{p} for year = 2005 - \hat{p} for year = 2007) when $\text{voc} = 50$? Round to 2 decimal places. .../2

27.1%

✗

Correct answer

0.27

Note that the difference in \hat{p} between years depends on VOC, but the difference in $\text{logit}(\hat{p})$ does not!

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