MATH 523 A1 Q4

2024-02-13

Question 4, part (a)

```
library(palmerpenguins)
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.2 --
## v ggplot2 3.4.0     v purrr   1.0.1
## v tibble  3.1.8     v dplyr   1.1.0
## v tidyr   1.3.0     v stringr 1.5.0
## v readr   2.1.3     v forcats 1.0.0
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
data(penguins)
penguins_complete<-penguins %>% drop_na()
penguins$sex <- ifelse(penguins$sex=="male", 0, 1)
model <- glm(sex ~ bill_length_mm + bill_depth_mm, data = penguins_complete, family = binomial())
summary(model)
```

```
##
## Call:
## glm(formula = sex ~ bill_length_mm + bill_depth_mm, family = binomial(),
##     data = penguins_complete)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -2.98154  -0.72058   0.09632   0.87867   1.72501
##
## Coefficients:
##                 Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -24.94444    2.89052  -8.630  < 2e-16 ***
## bill_length_mm   0.27107    0.03567   7.600 2.97e-14 ***
## bill_depth_mm    0.76716    0.09709   7.901 2.76e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 461.61  on 332  degrees of freedom
## Residual deviance: 323.64  on 330  degrees of freedom
## AIC: 329.64
##
## Number of Fisher Scoring iterations: 5
```

Question 4, part (b)

bill_length_nm = 0.27107 and bill_depth_nm = 0.76716

For each one-unit increase in bill length, the log odds of being male increase by 0.27107, and for each one-unit increase in bill depth, the log odds of being male increase by 0.76716, holding all else constant.The p-value for both are much smaller than 0.05 indicating that both bill length and bill depth are significant predictors of sex.