SPRIS Proj 4 Part b

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Question b

```
baseline =  read_excel("Q2b_BL.xlsx", col_types = "numeric")

study =  read_excel("Q2b.xlsx", col_types = "numeric")

df_2 = left_join(baseline, study) %>%
  mutate(SEX = factor(SEX),
         GROUP = factor(GROUP),
         TIME = factor(TIME))
```

```
## Joining with `by = join_by(ID)`
```

Little's test:

```
naniar::mcar_test(df_2) %>%
  knitr::kable(format = "latex")
```

statistic	df	p.value	missing.patterns
4539.557	6	0	2

```
# Fit logistic mixed effects model with random intercepts and random slopes
model <- glmer(SAE ~ TIME + AGE + SEX + GROUP +
                 (1 | ID/SITE) + GROUP*TIME, data = df_2, family = binomial)
```

```
## boundary (singular) fit: see help('isSingular')
```

```
# View model summary
summary(model)
```

```
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: SAE ~ TIME + AGE + SEX + GROUP + (1 | ID/SITE) + GROUP * TIME
##    Data: df_2
##
##      AIC      BIC   logLik deviance df.resid
##   2619.8   2716.1  -1299.9   2599.8   111442
```

```
##
## Scaled residuals:
##    Min     1Q Median     3Q    Max
## -0.064 -0.042 -0.039 -0.036 34.522
##
## Random effects:
##  Groups  Name        Variance Std.Dev.
##  SITE:ID (Intercept) 0        0
##  ID      (Intercept) 0        0
## Number of obs: 111452, groups:  SITE:ID, 41194; ID, 41194
##
## Fixed effects:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)  -7.286841   0.378187 -19.268   <2e-16 ***
## TIME2         0.059522   0.280454   0.212   0.8319
## TIME3         0.191977   0.273097   0.703   0.4821
## AGE           0.014345   0.006801   2.109   0.0349 *
## SEX1         -0.097628   0.151417  -0.645   0.5191
## GROUP1        0.465060   0.259171   1.794   0.0727 .
## TIME2:GROUP1 -0.150880   0.370151  -0.408   0.6836
## TIME3:GROUP1 -0.426288   0.374456  -1.138   0.2549
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) TIME2  TIME3  AGE    SEX1   GROUP1 TIME2:
## TIME2       -0.378
## TIME3       -0.388  0.523
## AGE         -0.827  0.000  0.000
## SEX1        -0.183  0.000  0.000 -0.008
## GROUP1      -0.397  0.552  0.566 -0.013 -0.005
## TIME2:GROUP  0.286 -0.758 -0.397  0.001 -0.001 -0.700
## TIME3:GROUP  0.283 -0.382 -0.729  0.000  0.000 -0.692  0.485
## optimizer (Nelder_Mead) convergence code: 0 (OK)
## boundary (singular) fit: see help('isSingular')
```

```
#Use ANOVA to check if interaction term is necessary
```