Homework#4 Problem 2

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```
library(class)
library(formatR)
```

```
## Warning: package 'formatR' was built under R version 3.6.3
```

```
admit_df <- read.table(file = "C:/Arinjay_Personal/Statistical Learning/Homework#4/admit.txt",
                  header = T)

admit_df <- data.frame(admit_df)

# Using the logit model: The code below estimates a logistic
#regression model using the glm (generalized linear model)
#function. First, we convert rank to a factor to indicate that
#rank should be treated as a categorical variable.

admit_df$rank <- factor(admit_df$rank)

log_model <- glm(admit~., data= admit_df, family = "binomial")
```

Part A

```
model_summary <- summary(log_model)
coff_table <- model_summary$coefficients[,-4]

print("Results from a logistic regression fit to the admit data.")
```

```
## [1] "Results from a logistic regression fit to the admit data."
```

```
coff_table
```

```
##                Estimate  Std. Error   z value
## (Intercept) -3.989979073 1.139950936 -3.500132
## gre          0.002264426 0.001093998  2.069864
## gpa          0.804037549 0.331819298  2.423119
## rank2       -0.675442928 0.316489661 -2.134171
## rank3       -1.340203916 0.345306418 -3.881202
## rank4       -1.551463677 0.417831633 -3.713131
```

Part B Write log-ratio equation:

```
print("log-ratio equation:")
```

```
## [1] "log-ratio equation:"
```

```
print("log(p/1-p) =-3.9899+(0.0022*gre)+(0.804*gpa)+(-0.6754*rank2)+(-1.3402*rank3)+(-1.5514*rank4)")
```

```
## [1] "log(p/1-p)
=-3.9899+(0.0022*gre)+(0.804*gpa)+(-0.6754*rank2)+(-1.3402*rank3)+(-1.5514*rank4)"
```

```
## now how we will use this equation, explanation with example
# estimated log-odds of graduate school admission for a student
#with a GPA of 3.2 and a GRE score of 670 who attended a rank 1
#school?

newdata <- data.frame(gre = 670, gpa = 3.2,rank = as.factor(1))

# solution:
predict(log_model,newdata)
```

```
##         1
## 0.1001064
```