current\_time <- Sys.time()

print(current\_time)

#Nichole Kang SID: 321150

customer\_data <- read\_excel(path = "C:\\Users\\nkang\\Desktop\\MIS480\\creditcardsbank.xlsx")

# Summary Statistics of Customer dataset

summary\_stats <- list(

  Min = min(customer\_data$credit\_score),

  Max = max(customer\_data$credit\_score),

  Mean = mean(customer\_data$credit\_score),

  Median = median(customer\_data$credit\_score),

  SD = sd(customer\_data$credit\_score)

)

print(summary\_stats)

current\_time <- Sys.time()

print(current\_time)

# Histogram of credit\_score for Customer dataset

options(scipen = 999999)

hist(customer\_data$credit\_score,

     main = "Histogram of Credit Score for Customer dataset",

     xlab = "Credit Score",

     ylab = "Frequency",

     xlim = c(300, 900),

     ylim = c(0, 4000),

     labels = TRUE,

     col = "blue",

     border = "black",

     breaks = 10)

current\_time <- Sys.time()

print(current\_time)

# Pie Chart for Credit Rating

credit\_counts <- table(customer\_data$credit\_rating)

names(credit\_counts) <- c("Poor", "Good", "Excellent")

colors <- c("red", "blue", "green")

percentages <- round(credit\_counts / sum(credit\_counts) \* 100, 1)

labels <- paste(names(credit\_counts), "\n", percentages, "%", sep="")

pie(credit\_counts, labels = labels, main = "Distribution of Credit Ratings", col = colors, border = "white")

legend("topright", legend = names(credit\_counts), fill = colors)

current\_time <- Sys.time()

print(current\_time)

**# Stacked Bar Plot of Credit Rating by Offer Accepted**

customer\_data$credit\_rating <- factor(customer\_data$credit\_rating,

levels = c(1, 2, 3),

labels = c("Poor", "Good", "Excellent"))

customer\_data$offer\_accepted <- factor(customer\_data$offer\_accepted,

levels = c(0, 1),

labels = c("No", "Yes"))

ggplot(customer\_data, aes(x = credit\_rating, fill = offer\_accepted)) +

geom\_bar(position = "fill") +

labs(title = "Proportion of Offers Accepted by Credit Rating",

x = "Credit Rating",

y = "Proportion") +

scale\_fill\_brewer(palette="Set1", name = "Offer Accepted") +

theme\_minimal()

current\_time <- Sys.time()

print(current\_time)

**# Logistic Regression**

customer\_data$credit\_rating <- as.factor(customer\_data$credit\_rating)

logistic\_model <- glm(offer\_accepted ~ credit\_rating + annual\_income,

data = customer\_data, family = binomial)

summary(logistic\_model)

current\_time <- Sys.time()

print(current\_time)

**# Predict using Credit Rating and Annual Income**

predicted\_probs <- predict(logistic\_model, newdata = customer\_data, type = "response")

predicted\_values <- ifelse(predicted\_probs > 0.5, 1, 0)

confusion\_matrix <- table(customer\_data$offer\_accepted, predicted\_values)

print(confusion\_matrix)