Mediation Analysis for Binary Outcome in R - R code from scratch

Notes:

1. The author accepts no responsibility for the topicality, correctness, completeness, or quality of the information provided.
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R code from scratch for Mediation Analysis for Binary Outcome (logistic regression)

Use log odds ratio in the b path - same method as PROCESS. However, instead of using PROCESS, we are going to write the function from scratch in Method 2.

Step 1: Read the data

```
# Read the data
data_mediation <-
  read.csv("https://raw.githubusercontent.com/tidydatayt/binary_mediation/main/binary_outcome_mediation

# show the first 6 rows of the data
head(data_mediation)
```

```
##           X          M Y
## 1 0.4395244  0.5780635 1
## 2 0.7698225 -0.2527934 1
## 3 2.5587083  1.7122184 1
## 4 1.0705084  1.1275652 1
## 5 1.1292877  1.8741262 1
## 6 2.7150650  0.8215054 1
```

Step 2: write the basic function

```
Mediation_function_binary_outcome<-function(data_used,i)
{
  # Sample a data
  data_temp=data_used[i,]

  # a path
```

```r
  result_a<-lm(M~X, data = data_temp)
  a_0<-result_a$coefficients[1]
  a_1<-result_a$coefficients[2]

  # b path
  result_b<-glm(Y~M+X, data = data_temp,family = "binomial")
  b_0<-result_b$coefficients[1]
  b_1<-result_b$coefficients[2]
  c_1_apostrophe<-result_b$coefficients[3]

  #calculating the indirect effect
  indirect_effect<-a_1*b_1
  return(indirect_effect)
}
```

Step 3:

```r
library(boot)
```

```
## Warning: package 'boot' was built under R version 4.1.3
```

```r
# use boot() to do bootstrapping mediation analysis
boot_mediation <- boot(data_mediation, Mediation_function_binary_outcome, R=5000)

# print out the indirect effect
boot_mediation$t0
```

```
##         X
## 0.3198675
```

```r
# print out confidence intervals
boot.ci(boot.out = boot_mediation, type = c("norm", "perc"))
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 5000 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = boot_mediation, type = c("norm", "perc"))
##
## Intervals :
## Level      Normal            Percentile
## 95%   ( 0.0826,  0.5463 )   ( 0.0993,  0.5691 )
## Calculations and Intervals on Original Scale
```