lab_04

2023-09-21

Vote Now for Your Favourite Thai Restaurant

Here, we are reading the `.csv` file and determining the sample size we need:

```
real_votes <- read.csv("./data/votes.csv")
sample_size <- nrow(real_votes)
```

Now, we write the required funciton that simulates one bootstrap sample and returns Imm Thai's percentage of votes:

```
one_resampled_percentage <- function(){
  bootstrap <- real_votes[sample(sample_size, replace = TRUE),]
  return((sum(bootstrap == "Imm Thai")/sample_size)*100)

}
```

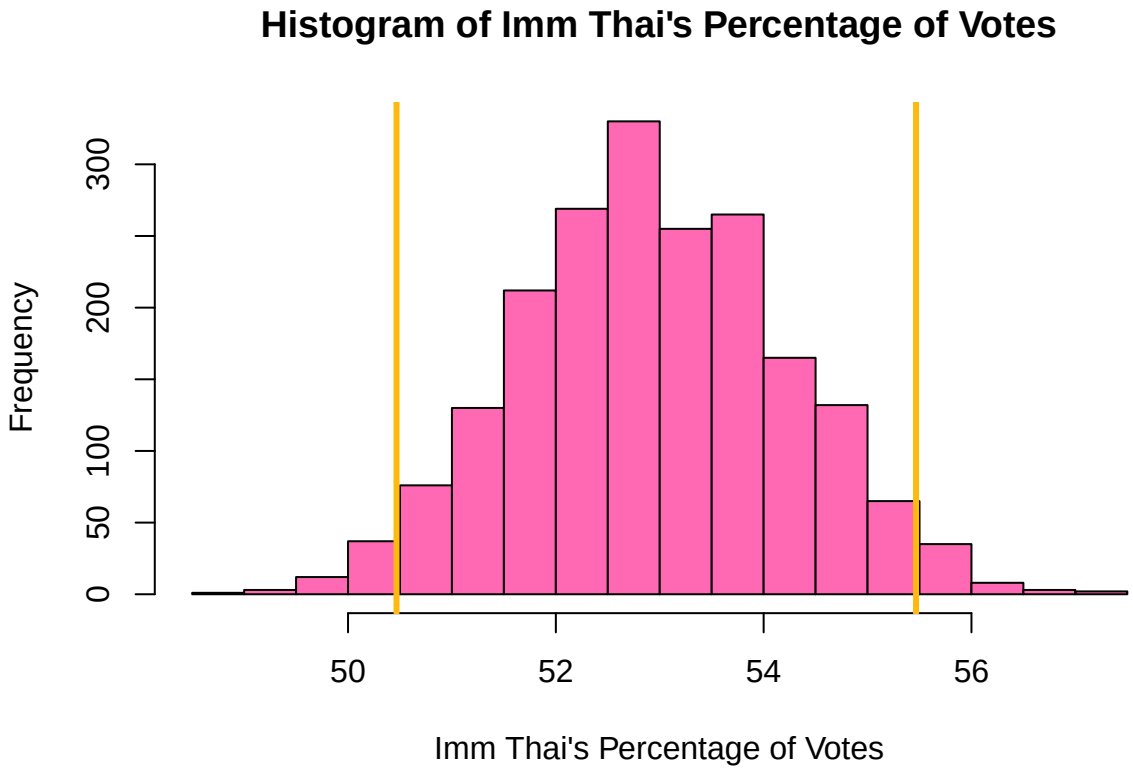
Now, we write the required function:

```
wrapper_percentage <- function(x){
  one_resampled_percentage()
}
percentages_in_resamples <- function(m){
  return(sapply(1:m, wrapper_percentage))
}
```

Here, we simulate 2000 times as required, and find the lower and upper bounds for the 95%-confidence interval:

```
so_many_sim <- percentages_in_resamples(2000)
imm_lower_bound <- quantile(so_many_sim, 0.025)
imm_upper_bound <- quantile(so_many_sim, 0.975)
```

Our histogram for the simulations:



Imm (Thai) Doing So Much Better Than You

Now, we write the function for calculating Imm Thai's lead over the other restaurants:

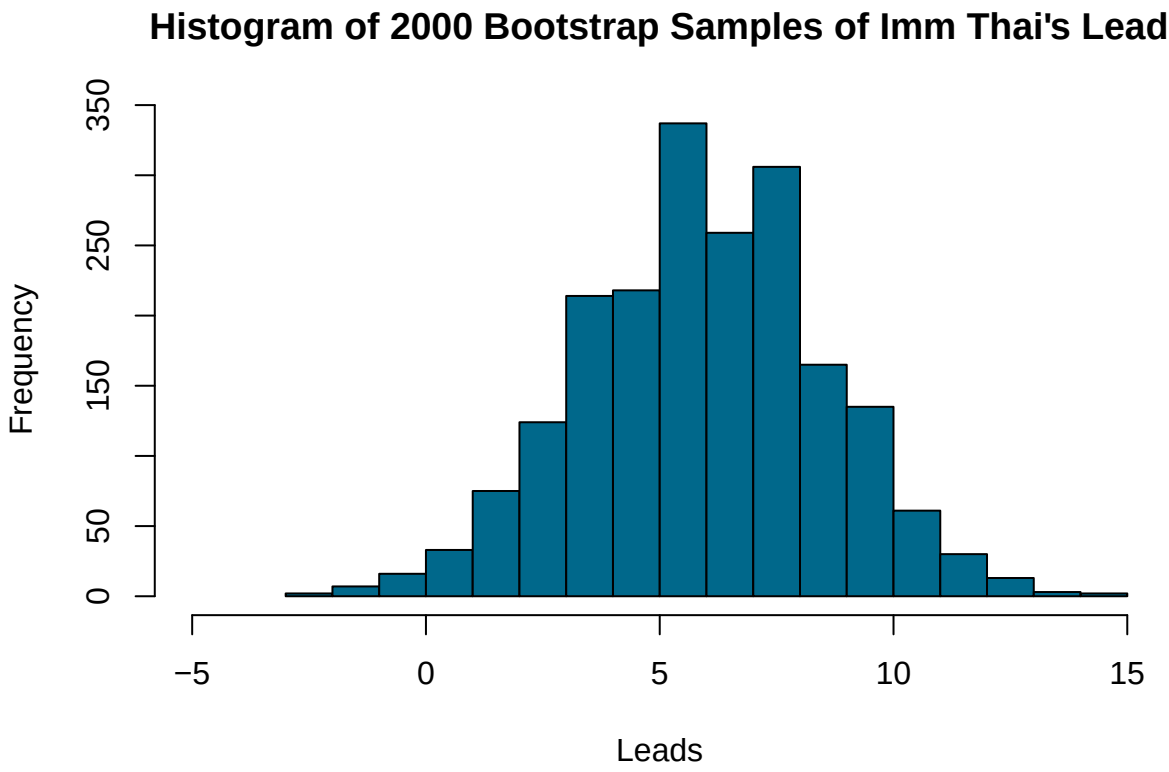
```
one_resampled_difference <- function() {
  bootstrap <- real_votes[sample(sample_size, replace = TRUE),]
  imm_thai_percentage <- (sum(bootstrap == "Imm Thai")/sample_size)*100
  lucky_house_percentage <- (sum(bootstrap == "Lucky House")/sample_size)*100
  thai_temple_percentage <- (sum(bootstrap == "Thai Temple")/sample_size)*100
  thai_basil_percentage <- (sum(bootstrap == "Thai Basil")/sample_size)*100
  return(imm_thai_percentage - (lucky_house_percentage
                                + thai_temple_percentage
                                + thai_basil_percentage))
}
```

Simulating 2000 times:

```
wrapper_difference <- function(x){
  one_resampled_difference()
}

resampled_leads <- sapply(1:2000, wrapper_difference)
```

Finally, the required histogram, in a lovely blue:



And here is question 7:

```
## [1] A 95%-CI for Imm Thai's true lead over the other restaurants is (0.93, 10.93).
```