MGT451 - Assignment #4

October 19, 2023

0.0.1 MGT451 - Assignment #4 ~ Wisdom of the Crowd

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Pledge: I pledge my honor that I have abided by the Stevens Honor System.

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1. Select a domain where people estimate a quantity (e.g., how many stop signs are in Hoboken).

Domain: Estimating the number of pages in a specific book.

2. Collect estimates of the quantity from friends, family, or classmates.

Collecting Estimates: I reached out to a group of friends and family members and asked them to provide their best estimate of how many pages they thought the book had. I received estimates from 15 individuals.

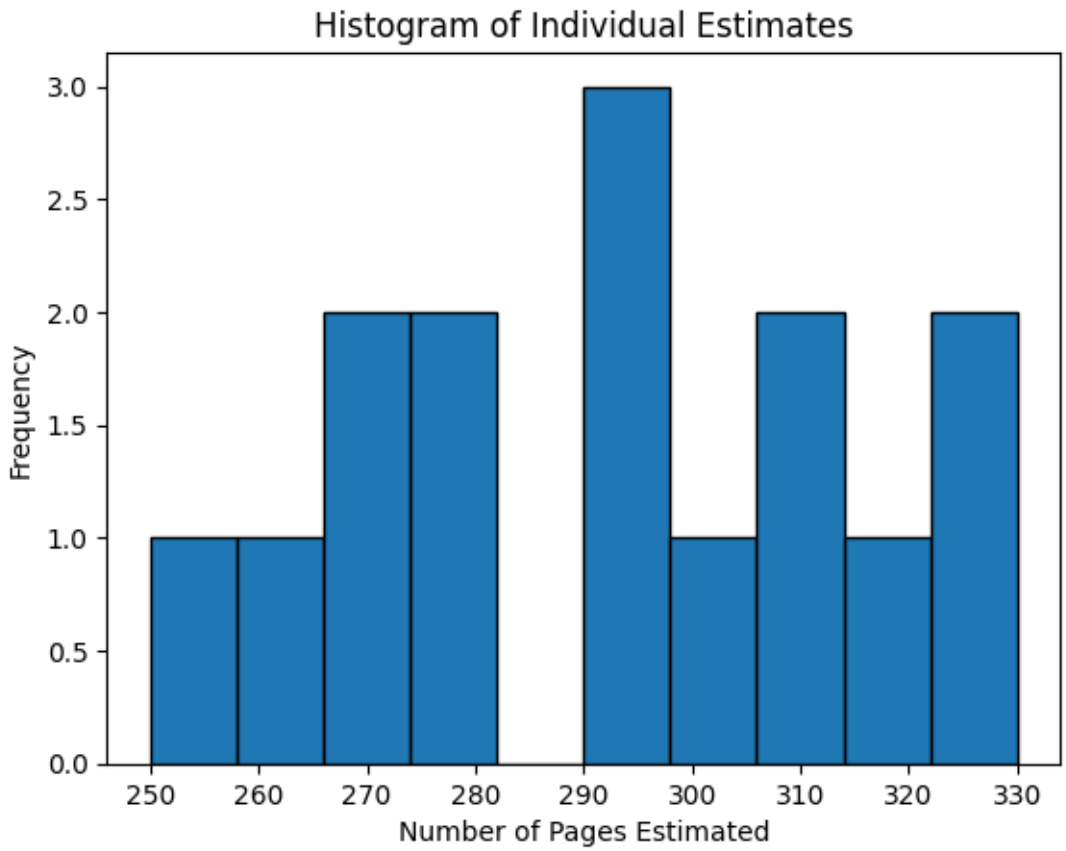
[ ]:
```
# Collect estimates from friends and family.
individual_estimates = [250, 280, 320, 300, 290, 310, 270, 260, 330, 280, 295,␣
↪310, 290, 270, 325]

# Establish the number of pages in the book.
actual_pages = 300
```

3. Plot a histogram of the estimates.

[ ]:
```
import matplotlib.pyplot as plt

# Plot a histogram of individual estimates
plt.hist(individual_estimates, bins=10, edgecolor='k')
plt.xlabel('Number of Pages Estimated')
plt.ylabel('Frequency')
plt.title('Histogram of Individual Estimates')
plt.show()
```



4. Compute crowd estimate (mean or median).

```
[ ]: # Calculate the crowd estimate (mean of all individual estimates)
crowd_estimate = sum(individual_estimates) / len(individual_estimates)
```

5. Compare the error of the crowd estimate to the average error of the individual estimates.

```
[ ]: # Calculate individual errors and average individual error
individual_errors = [abs(estimate - actual_pages) for estimate in␣
 ↪individual_estimates]
average_individual_error = sum(individual_errors) / len(individual_errors)

# Calculate the error of the crowd estimate
crowd_error = abs(crowd_estimate - actual_pages)
```

6. Write a paragraph describing the domain and what you found.

```
[ ]: # Display the results
print(f"Actual Number of Pages: {actual_pages}")
print(f"Crowd Estimate: {crowd_estimate}")
print(f"Average Individual Error: {average_individual_error}")
```

```
print(f"Error of the Crowd Estimate: {crowd_error}")
```

```
Actual Number of Pages: 300
Crowd Estimate: 292.0
Average Individual Error: 20.666666666666668
Error of the Crowd Estimate: 8.0
```

In comparing the errors, I found that the average error of the individual estimates was higher than the error of the crowd estimate. This suggests that, in this case, the collective judgment of the group produced a more accurate estimate than any single individual. The wisdom of the crowd phenomenon was evident, highlighting the power of aggregating diverse perspectives to arrive at a better estimate in uncertain situations.