Research Question:

"Exploring Collection Classes in Object-Oriented Programming: What are the performance characteristics of different collection classes?"

Research Method:

1. Literature Review:

- Conduct an extensive literature review to understand the concepts of collection classes in object-oriented programming languages.

- Explore existing research on the performance of collection classes and their applications in software development.

2. Selection of Collection Classes:

- Choose a set of commonly used collection classes for evaluation, such as Array, Linked List, Set, and Dictionary.

- Justify the selection based on their prevalence in various programming languages and practical significance.

3. Data Collection:

- Design experiments to measure the performance of the selected collection classes.

- Define common collection operations, such as adding, removing, and finding elements.

- Decide on the sizes of the collections to be used in the experiments (e.g., 100 and 1000 elements).

4. Performance Measurement:

- Implement demo programs to execute the collection operations on each selected class.

- Measure the execution times for each operation and record the data.

5. Data Analysis:

- Analyze the collected data to compare the performance of different collection classes.

- Interpret the results to identify trends and patterns related to the size of collections and the type of operations performed.