.Net Data Structures Lab Report

# Test

This assignment tested the performance of data retrieval in .NET data structures in a C# Windows application.

The following data structures were tested:

1. List
2. ArrayList
3. Dictionary
4. HashTable

A text file containing 466,544 strings is read and added to each data structure.

The string "pachmeningitis" is searched for in each data structure. This string was located in the middle of the text file. The test is performed 100,000 times and the average time was recorded.

# Results

|  |  |
| --- | --- |
| **.NET Data Structure** | **Retrieval Time** |
| List | 00:00:00.0023091 |
| ArrayList | 00:00:00.0014555 |
| Dictionary | 00:00:00.0000020 |
| HashTable | 00:00:00.0000009 |

# Conclusion

The HashTable data structure has the best retrieval time for searching for a string. This is due to the fact that the HashTable is made up of several smaller lists. The strings are inserted into different lists based on a hash value calculated by the HashTable on insertion.

The Dictionary data structure had the second fastest retrieval time. The dictionary had very similar results as the HashTable. This is due to the fact that the Dictionary datatype also uses a HashTable.

The List and ArrayList were the slowest for data retrieval. The main difference between a List and an ArrayList is that you need to declare the data type for list on run-time. These two datatypes are very slow for data retrieval due to the fact that the contains function needs to step through each element in the datatype until it finds the item.