**Programming Assignment 2**

**B-Trees**

- Implement the search method for a B-Tree.

- The method should return the node containing the key if it exists, otherwise, it should return null.

- Implement the insert and delete methods for a B-Tree.

- Ensure that the tree remains balanced after each operation.

- Write unit tests to verify the correctness of both operations.

**Dynamic Programming**

- Implement the rod cutting problem using dynamic programming.

- Write a function that receives a rod length and a list of prices and returns the maximum revenue achievable.

- Implement the Longest Common Subsequence (LCS) problem using dynamic programming.

- Write a function that receives two strings and returns their LCS.

**Greedy Algorithms**

- Implement a greedy algorithm for a suitable problem of your choice (e.g., coin change, scheduling).

- Justify the choice of the greedy strategy for this problem.

- Write unit tests to verify the correctness of your algorithm.

**Huffman Codes**

- Implement Huffman coding for text compression.

- Write a function that takes a string as input and outputs the encoded string along with the Huffman tree.

- Write a decoding function that takes the encoded string and the Huffman tree and returns the original string.

- Write unit tests to ensure your Huffman coding and decoding work correctly.

**Graphs - BFS and DFS**

- Implement both Breadth-First Search (BFS) and Depth-First Search (DFS) for graphs represented using adjacency lists.

- Write functions that perform BFS and DFS starting from a given node and explore all connected components.

- Write unit tests to verify the correctness of both BFS and DFS implementations.

**Submission Requirements**

- Your code should be well-documented with comments explaining the functionality of each component.

- Ensure that all unit tests pass and provide coverage for edge cases in your implementations.

- Submit a report detailing your approach, challenges faced, and the complexity analysis of each algorithm implemented(just code running times with some comments are enough).