**Software Specification:**

The code is implemented in Eclipse IDE and in JAVA.

The Code contains following classes:

1)ArrayImplementation.java

2)HashingImplementation.java

3)Searching.java

4)Sorting.java

5)main.java

1)ArrayImplementation.java:

This class contains code to enlarge the array based on the number of lines from the input file. The initial size of array will be 10 as placing values of hashing with elements less than 10 would create issue. If the array reaches limit it doubles each time.

Add Method:

This adds the elements in the array and there are separate methods to add string,float and integer.

IsFull Method:

Is full checks if the array is full or not

IsEmpty Method:

This method checks if the array is empty or not.

2)HashingImplementation.java

This class is used to create hash arrays from given array and perform operations like hash search.

Hash Method:

This method is used to generate hash values for given values and there are separate methods to add string ,float and integer.

Add Method:

This method is used to add values into hash array and there are separate methods to add string, float and integer.

Hash Search Method:

This method searches the target value in hash array.

3)Searching.java:

This class is used in searching the target value in the array with Linear and Binary search methods

LinearSearch Method:

This Method Searches the array linearly and returns index if target is found in the array

Binary Search Method:

This method uses recursion to find if the element is present in the array. The array should be sorted before implementing this method.

4)Sorting.java:

This class implements sorting algorithms to sort the given array.

SelectionSort Method:

This method compares all the elements of array with next index and swaps if the element in current index is greater than the next element. The difference with bubble sort is it swaps immediately where as selection sort holds the index making less number of sorts.

BubbleSort Method:

Bubble sort works same way as selection sort where as it sorts immediately.

Insertion Sort Method:

Insertion sort uses a method to maintain the sorted array of some elements and later on sorts the entire array like playing cards.

Quick Sort Method:

This method splits the array based on pivot value and create partitions to make final sorted array.

Merge Sort:

This method splits the array and sorts the individual arrays and merges to form a whole sorted array.

Heap Sort:

This method heapifies the array and arranges the data to sort.

5)main.java

This Method is used in reading the text file and reading inputs from users and implementing all the classes and methods created.