A)	Array Operation
	1)Binary Seach

	Code:
	
	const read = require('readline-sync')
	
	var arr=[]
	var size = read.question('Enter the size of the array : ')
	console.log(`Enter the ${size} elements into the array : `);
	for(i=0;i<size;i++)
	{
	arr[i]=read.question('')
	}
	
	var key = read.question('Enter the element to be searched in the array : ')
	var first=0
	var last = arr.length -1
	
	index = binarySearch(arr, first, last, key);
	
	if (index == -1)
	console.log('ELement not found in the array')
	else
	console.log(`${key} is present at location ${index+1}`)
	
	function binarySearch(arr, s, e, f) {
	var m;
	
	if (s > e)
	return -1;
	
	m = (s + e)/2;
	
	if (arr[m] == f)
	return m;
	else if (f > arr[m])
	return binarySearch(arr, m+1, e, f);
	else
	return binarySearch(arr, s, m-1, f);
	}

	Output

```
PS F:\SPS\Week 3\Assignments Week 3> node .\arraySearch.js
Enter the size of the array : 5
Enter the 5 elements into the array :
1
2
3
4
5
Enter the element to be searched in the array : 3
3 is present at location 3
PS F:\SPS\Week 3\Assignments Week 3> []
```

2)Quick Sort

Code:

```
const read = require('readline-sync')
var list = []

var size = read.question('Enter the size of the array')
console.log(`Enter the ${size} elements into the array : `);
for(i=0;i<size;i++)
{
   list[i]=read.question('')
}



   var size, i;
   quicksort(list, 0, size - 1);
   console.log("The sorted elemnts");
   for (i = 0; i < size; i++)
   {
      process.stdout.write(list[i]+" ")

   }
   console.log("\n");


function quicksort( list,  low, high)
{
   var pivot, i, j, temp;
   if (low < high)
   {
      pivot = low;
      i = low;
```

```
        j = high;
        while (i < j)
        {
            while (list[i] <= list[pivot] && i <= high)
            {
                i++;
            }
            while (list[j] > list[pivot] && j >= low)
            {
                j--;
            }
            if (i < j)
            {
                temp = list[i];
                list[i] = list[j];
                list[j] = temp;
            }
        }
        temp = list[j];
        list[j] = list[pivot];
        list[pivot] = temp;
        quicksort(list, low, j - 1);
        quicksort(list, j + 1, high);
    }
}
```

Output:

```
PS F:\SPS\Week 3\Assignments Week 3> node .\quickSort.js
Enter the size of the array5
Enter the 5 elements into the array :
2
1
3
6
3
The sorted elemnts
1 2 3 3 6
```

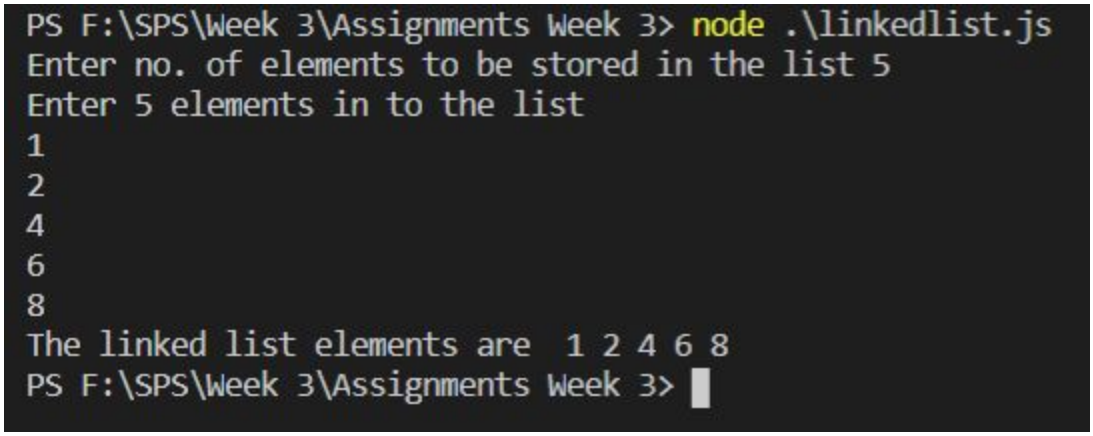
B) Linked List

1)Insertion

```
const read = require('readline-sync')

class Node {
```

```
    constructor(element)
    {
        this.element = element;
        this.next = null
    }
}

function add(element)
{

        var node = new Node(element);

        var current;

        if (this.head == null)
                this.head = node;
        else {
                current = this.head;

                while (current.next) {
                        current = current.next;
                }

                current.next = node;
        }
        this.size++;
}



var size = read.question('Enter no. of elements to be stored in the list ')
console.log(`Enter ${size} elements in to the list `)
for(i=0;i<size;i++){
    var item = read.question('')
    add(item)
}

printList()
function printList()
{
    var curr = this.head;
    var str = "";
    while (curr) {
        str += curr.element + " ";
        curr = curr.next;
    }
    console.log("The linked list elements are ",str);
}
```

OUTPUT



2)Deletion

```
const read = require('readline-sync')

class Node {

   constructor(element)
   {
      this.element = element;
      this.next = null
   }
}

function add(element)
{

        var node = new Node(element);

        var current;

        if (this.head == null)
                this.head = node;
        else {
                current = this.head;

                while (current.next) {
                        current = current.next;
                }

                current.next = node;
        }
        this.size++;
}
```

```
function removeElement(element)
{
    var current = this.head;
    var prev = null;

    while (current != null) {

        if (current.element === element) {
            if (prev == null) {
                this.head = current.next;
            } else {
                prev.next = current.next;
            }
            this.size--
            return current.element;
        }
        prev = current;
        current = current.next;
    }
    return -1
}
var size = read.question('Enter no. of elements to be stored in the list ')
console.log(`Enter ${size} elements in to the list `)
for(i=0;i<size;i++){
    var item = read.question('')
    add(item)
}

printList()
function printList()
{
    var curr = this.head;
    var str = "";
    while (curr) {
        str += curr.element + " ";
        curr = curr.next;
    }
    console.log("The linked list elements are ",str);
}
var key = read.question('Enter the element to be removed from the list ')
removeElement(key)
printList()
function printList()
{
    var curr = this.head;
    var str = "";
    while (curr) {
        str += curr.element + " ";
        curr = curr.next;
    }
```

```
    console.log("The linked list elements are ",str);
}
```

```
PS F:\SPS\Week 3\Assignments Week 3> node .\linkedlist.js
Enter no. of elements to be stored in the list 4
Enter 4 elements in to the list
2
3
4
6
The linked list elements are  2 3 4 6
Enter the element to be removed from the list 3
The linked list elements are  2 4 6
PS F:\SPS\Week 3\Assignments Week 3>
```

3)Updation

```
const read = require('readline-sync')

class Node {

    constructor(element)
    {
        this.element = element;
        this.next = null
    }
}

function add(element)
{

        var node = new Node(element);

        var current;

        if (this.head == null)
                this.head = node;
        else {
                current = this.head;

                while (current.next) {
                        current = current.next;
                }

                current.next = node;
        }
```

```
        this.size++;
}



var size = read.question('Enter no. of elements to be stored in the list ')
console.log(`Enter ${size} elements in to the list `)
for(i=0;i<size;i++){
    var item = read.question('')
    add(item)
}

printList()
function printList()
{
    var curr = this.head;
    var str = "";
    while (curr) {
        str += curr.element + " ";
        curr = curr.next;
    }
    console.log("The linked list elements are ",str);
}
var key = read.question('Insert the element to be inserted in the list ')
add(key)
printList()
```

Output

```
PS F:\SPS\Week 3\Assignments Week 3> node .\linkedlist.js\
Enter no. of elements to be stored in the list 4
Enter 4 elements in to the list
1
2
3
4
The linked list elements are  1 2 3 4
Insert the element to be inserted in the list 3
The linked list elements are  1 2 3 4 3
PS F:\SPS\Week 3\Assignments Week 3>
```
