
# MAHARISHI INTERNATIONAL UNIVERSITY

Assignment Four

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# Assignment 4

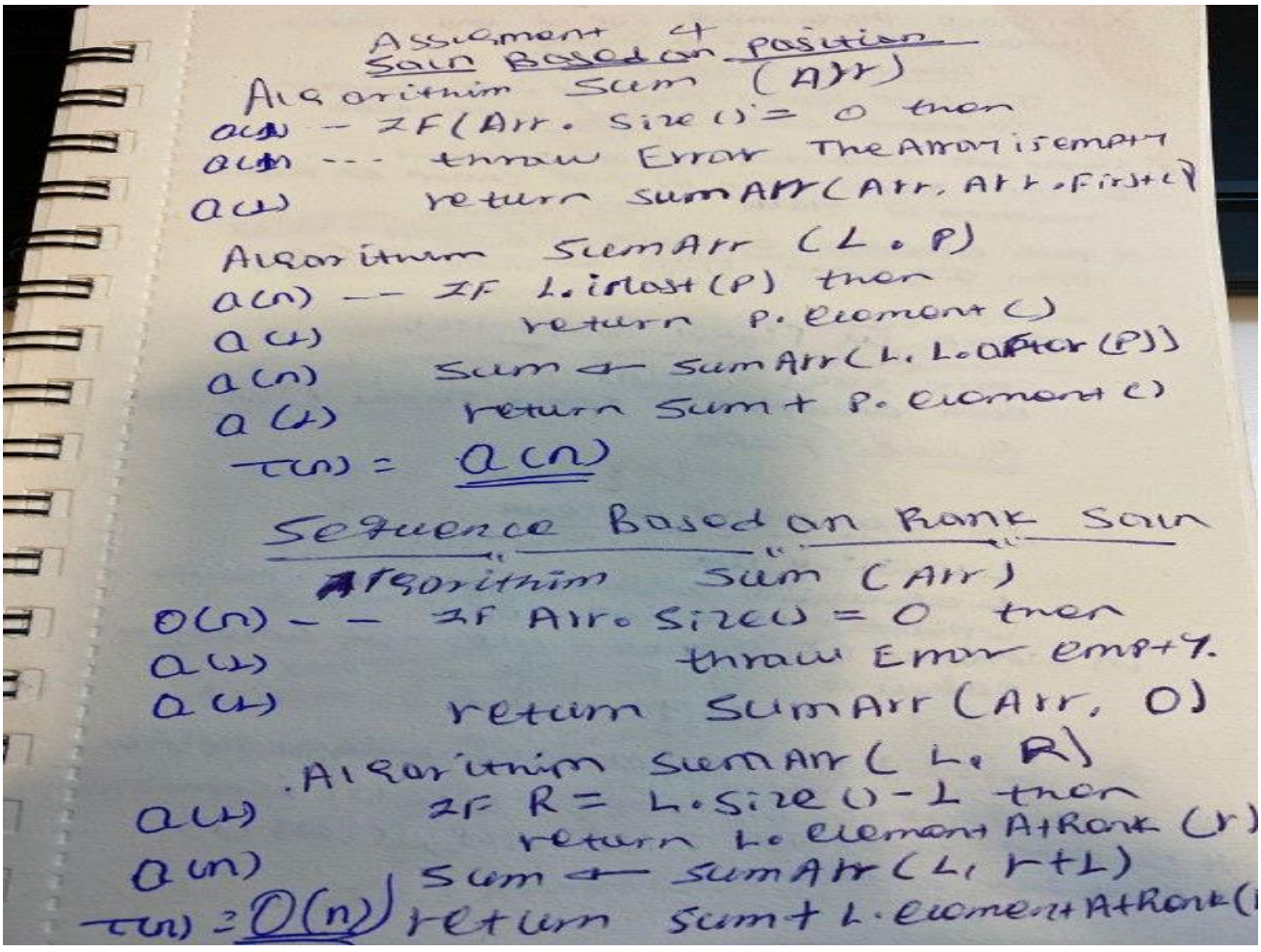
A. (a) Write a recursive method, sum (L), in pseudo-code to calculate the sum of the integers in the list L of integers. First use positions to traverse the list. See the

Hint in the lecture notes. Analyze line by line your algorithm.

(b) Write a second recursive algorithm that uses the rank-based operations to traverse the list to calculate the sum. Analyze your algorithm line by line.

(c) Choose the better algorithm, either (a) or (b), then implement that algorithm in JavaScript using the List.js file provided in a previous assignment.

**Pseudo code and time complexity analysis**



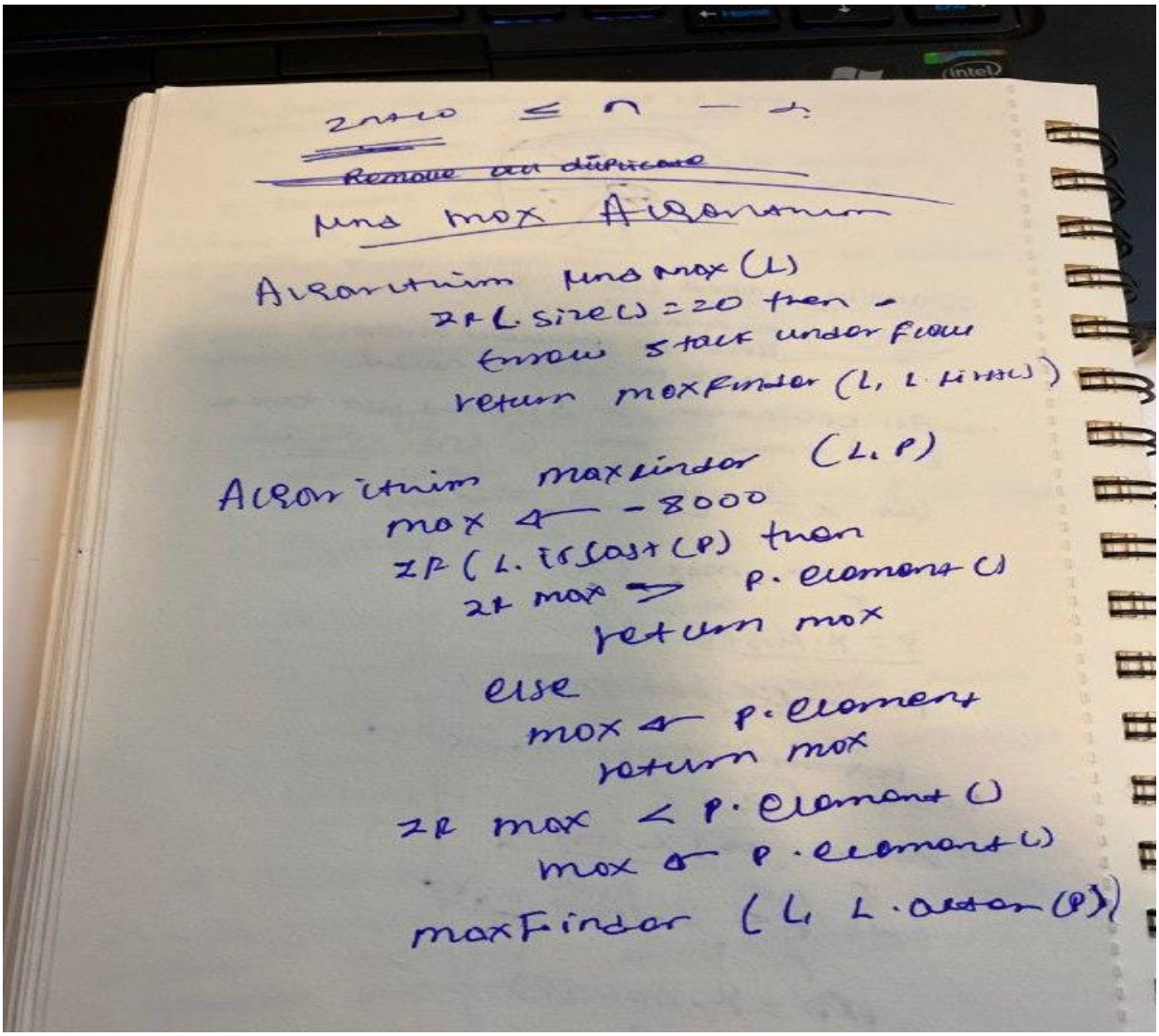
**Java script implementation source code in sequence based**

```
function sum(l)
{

    if(l.size()==0)
    {
        throw new Error ("empty array")
    }
    return sumh(l,l.first())
}
function sumh(l,p)
{
    if(l.isLast(p))
    {
        return p.element();
    }
   let  x=sumh(l,l.after(p))
    return x+p.element();
}


console.log("the sum ",sum(tst2));
```

B. Design a pseudo-code recursive method, findMax(L), that returns the maximum

Number in the list L. Implement in JavaScript using the List.js file provided previously.

**Pseudo code**




**Source code based on JavaScript**

```
function findMax(l) {
    return maxHelper(l, l.first());
}
function maxHelper(l, p) {
    if (l.isEmpty()) { return 0; }
    else if (l.isLast(p)) { return p.element() }
```

```
    else {
        return Math.max(p.element(), maxHelper(l, l.after(p)));
    }
}

findMax(tst2);
```