

ASSIGNMENT

Exercise 1 : Find the max element in an array

Pre condition :

- We have to define the variables `a[]` to get the array values and `max` to store the max element.
- First we assume `max = a[0]` as max value to compare with others.
- Start comparing from the variable `i=1` to the length of the array.

Post condition :

- Once the loop condition is completed the max value is stored in the variable we declared.

Loop variant :

- The loop will completed when the comparison from `i=1` to `i<a.length` condition is satisfied.

Loop invariant :

- We assumed that `max=a[0]` as the max value, the loop will start from `a[1]` to `a.length`.
- If the value is greater than the max (`a[i]>max`) then it is stored in the max variable that we declared.
- After storing the value the loop will update the iteration and to compare with next one.
- In such case the loop not satisfied the condition, then it will came out from the loop.

Pseudo code :

```
int maxElement(int a[] )
{
    int max=a[0];
    for(int i=1;i<a.length;i++)
    {
        if(a[i]>max)
            max=a[i];
    }
    return max;
}
```

Exercise 2 : Move zeros to end

Pre condition:

- We need to define the variables, arr[] is to get the array values, we initialize, int=temp is to store the swapping output that we get.
- The pointers variable l and r is used to swap the elements.

Post condition:

- Once the loop terminate the zeros will moves to the end and stored in the temp variable.

Loop variant :

- The loop will completed when the cycle from r=0 to arr.length condition is satisfied,

Loop invariant :

- The loop will compare from r to arr.length, when the condition satisfied it will get into the loop.
- If the right pointer is equals to zero it will incremented and moved to the next element.
- If the condition fails then the value pointing by right pointer swapped to the left pointer.
- Once the value is swapped left pointer will incremented and moved to the next element.
- When the right pointer moved out of the index then the loop will complete and the final output is stored in the temp variable.

Pseudocode :

```
int moveZeroesToEnd(int arr[])
{
    int l= 0;
    int r= 0;
    int temp;

    while (r < arr.length)
    {
        if (arr[r] == 0)
            r++;
        else
```

```
        int temp = arr[l];
        arr[l] = arr[r];
        arr[r] = temp;
        l++;
        r++;
    }
    return temp ;
}
```