**Exercise 1 ;**

**FIND THE MAXIMUM ELEMENT IN THE ARRAY**

**ALGORITHMS:**

**PRE CONDITION:**

**Start**

Create a initial set of array elements, that is **arr [ ] = 0**

Initializing **i , temp = 0 ,**

Here **“i”** is a variable that act in a loop for a index value and **temp = 0** will be taken as a temporary value for this condition

**POST CONDITION :**

In the end of the loop condition,

All the element in the set of array are compare with nearby element and finally resulted the maximum element of the array , using a temp value.

**LOOP VARIANT :**

In the loop ,

When the array value “arr( i )” in the given set of the array is than the loop condition less than the temp value [ arr(i)>temp) is false ] than the loop is stop

And again next array element will get into the loop

**LOOP INVARIANT :**

In the loop ,

The array value ( i ) is greater than the previous stores array value “arr( i )”, then it is true.

That final element of the array , is taken as the maximum element .

This is the result of the given array element .

**End**.

**PSEUDOCODE :**

Int i , arr [ ] = {value} , temp=0 ;

For

( i=0 ; i < arr.length ; i++)

{

If ( arr[ i ] > temp )

{

temp = arr [ i ] ;

}

}

**EXERCISE 2 :**

**CONVERT ROMAN LETTERS TO INTEGERS**

**ALGORITHMS:**

**PRE CONDITION :**

**Start**

Initiate a value for every roman letter which given in the list using char, integer, string.

Here using a **“if – condition”** assign the return value for the every given roman numerals and stores in **“ r ”**

Initialize **result = 0**

**POST CONDITION :**

After end of the loop condition ,

Every characters in the given input are assigned individual values and result of all roman characters will be display as number values.

**LOOP VARIANT AND INVARIANT :**

Hereget value for r1 and r2 (r=roman) from the if-condition.

Next, Using loop

Compare r1 and r2 value with (r1 >= r2) condition, If this condition is true,

then add the (r1+r2) value and get the the result and stores.

If the condition is false, then subtract (r2-r1) value and get the result and stores.

When r1 and r2 are condition statisfied , then the result will be shown in output.

**PSEUDOCODE :**

int value (char r) , n ;

{

If ( r == “ “)

Return value();

Return -1;

}

Int romtodec (string str )

  {

int result = 0;

int r1 = value();

int r2 = value();

if (r1 >= r2)

{

       result = result + r1;

                }

else

{

        result = result + r2 - r1;

                    i++;

                }

    }

else

{

         result = result + r1;

             }

   }

Return result();

 }

**Exercise 3 ;**

**MOVES ZEROS TO THE END OF THE ARRAY**

**ALGORITHMS:**

**PRE CONDITION:**

Start

Create a initial set of array elements, that is **arr [ ] = 0**

Initializing **count = 0 ,**

**POST CONDITION:**

In the end of the loop condition,

All the element in the array[ ] are splits , then all non zero elements are order from a[0] and remaining zeroes elements are followed by the non zeroes order at the end of the array.

**LOOP VARIANT AND INVARIANT :**

In the loop conditions,

All the elements in the array are get into the loop and follow the condition ( arr[i] != 0)

If this condition is true , then the non zero elements are puts into a new array arr[ i ]. And count++ till the end of the array

Or this conditions is false , in while condition the zero elements are counted followed by the elements in the end of the array

At the result , in the array the non zero elements are in right side and zero elements are in the left side of the final array.

**PSEUDOCODE :**

Int arr[] , count = 0

{

for

{

(i = 0 ; i < arr.len ; i++)

{

if (arr[i] != 0)

arr[count++] = arr[i];

}

}

While (count < arr.len)

{

arr[count++] = 0;

}

For ( inr data: arr )

}

}