K. J. Somaiya College of Engineering,
Mumbai-77

(A Constituent College of Somaiya Vidyavihar University)

Batch: G3	**Roll No.: 16010421063**
Experiment / assignment / tutorial No. 7	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

TITLE: Virtual Lab experiment on matrix multiplication

AIM: Virtual Lab experiment on recursion

https://cse02-iiith.vlabs.ac.in/

https://cse02-iiith.vlabs.ac.in/exp/arrays/simulation.html

CO4:Design modular programs using functions and demonstrate the concept of pointers and file handling

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Books/ Journals/ Websites referred:

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving , G. Michael Schneider ,Wiley India edition.
4. http://cse.iitkgp.ac.in/~rkumar/pds-vlab/

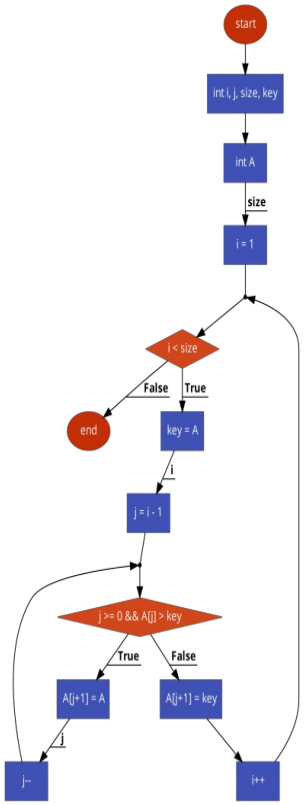
Problem Definition:

The Program implements 1-D and 2-D arrays.

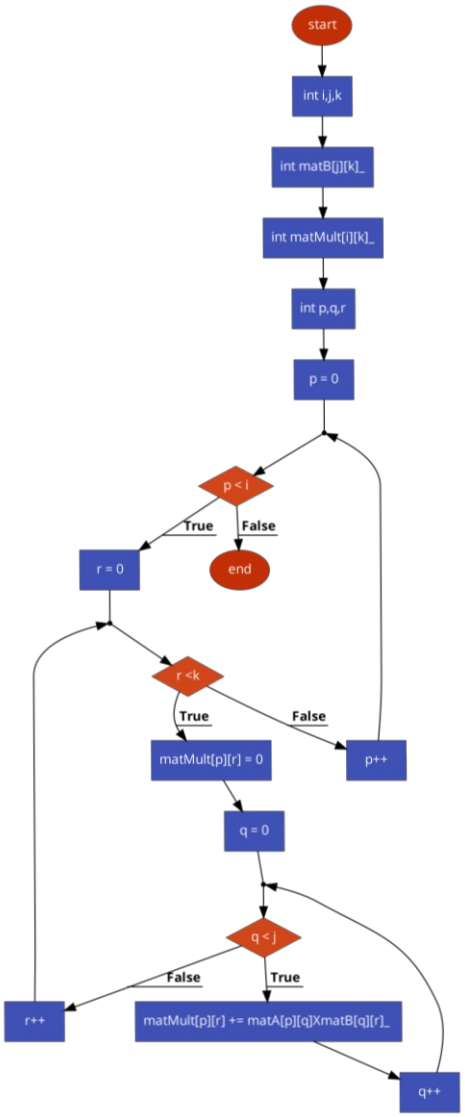
1-D array prompts the user to enter the size of the array and elements. It then sorts the elements.

2-D array prompts the user to enter the order of two matrices and the elements. It then performs matrix multiplication.

Flowchart: for 1D



For 2D


start
int i,j,k
int matB[j][k]_
int matMult[i][k]_
int p,q,r
p = 0
p < i
True
False
end
r = 0
r <k
True
False
matMult[p][r] = 0
p++
q = 0
q < j
False
True
r++
matMult[p][r] += matA[p][q]XmatB[q][r]_
q++

Implementation details:

For 1D

```
int main(){
int i, j, size, key ;
int A[size];
for( i = 1 ; i < size ; i++ )
{
    key = A[i];
    j = i - 1;
    while ( j >= 0 && A[j] > key )
    {
        A[j+1] = A[j];
        j--;
    }
    A[j+1] = key;
}
return 0 ;
}
```

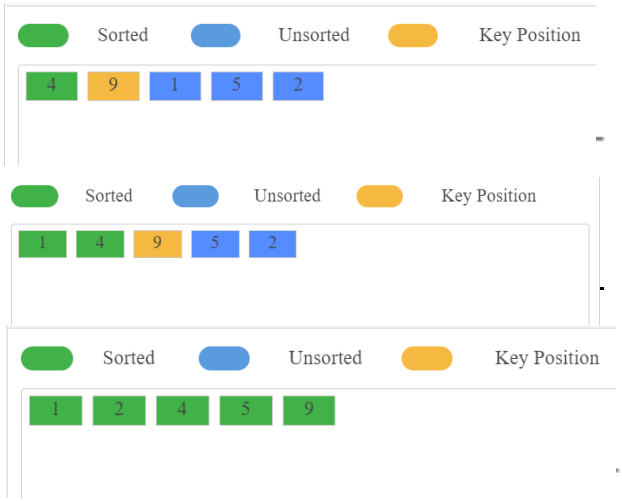
For 2D

```
int main(){
int i,j,k;
int matA[i][j];
int matB[j][k];
int matMult[i][k];
int p,q,r;
for ( p = 0 ; p < i ;p++ )
    {
        for ( r = 0 ; r <k ; r++ )
        {
            matMult[p][r] = 0;
            for ( q = 0 ; q < j ; q++ )
            {
                matMult[p][r] += matA[p][q]*matB[q][r]
            }
        }
    }
}
```

Output(s):

(Attach screenshots of the Output of Program Code implemented in Virtual Lab and Quiz attempted)

For 1D



For 2D

Code Output

Matrix A		Matrix B	
7	12	12	8
13	2	13	4

Resultant Matrix

-1	-1
-1	-1

Code Output

Matrix A		Matrix B	
7	12	12	8
13	2	13	4

Resultant Matrix

240	104
182	112

Conclusion:

Pre-test:

1. In C programming, Arr[1] refers to which element of an array Arr.
- a: 1
- (•) b: 2
- c: 3
- d: 0

2. The first element of an array is referred to by which index
- a: 1
- b: 2
- c: 3
- (•) d: 0

3. The index of the last element of an array of size n elements is:
- a: n
- (•) b: n-1
- c: n+1
- d: n-2

Submit Quiz

3 out of 3

Post-test

The memory address of the first element of an array is called
- a: Floor address
- b: Foundation address
- c: First address
- (•) d: Base address

The memory allocation for array elements is done
- (•) a: Contigously
- b: Randomly

If the memory address of the first element of an array is 2000, what is the memory address of the 6th ememen
- (•) a: 2020
- b: 2012
- c: 2006
- d: 2024

In C programming, a string is actually a
- (•) a: Array of integers
- b: Array of characters
- c: Variable
- d: None of the above

Submit Quiz

4 out of 4

Conclusion: Hence we understood implementation of 1D and 2D array.

Post Lab Descriptive Questions

1. **Can we change the size of an array at run time? Why or why not?**
   For providing memory on a stack the size of the memory should be known to the compiler during compile time. So that during run time that much memory can be set aside for the variable on the stack.
   Hence we cannot decide the size of the array at run time as far as C language is concerned.

2. **Can we pass an array as an argument to a function?**
   There are two possible ways to do so, one by using call by value and other by using call by reference.

   *array as a parameter: Example: int sum (int arr[]);

   *pointers in the parameter list, to hold the base address of our array

   :Example: int sum (int* ptr);

Date:_____ **Signature of faculty in-charge**