K. J. Somaiya College of Engineering,

Mumbai-77

(A Constituent College of Somaiya Vidyavihar University)

Batch: P5-2 Roll No.: 16010422185

Experiment / assignment / tutorial No. 7

Grade: AA / AB / BB / BC / CC / CD /DD

Signature of the Staff In-charge with date

TITLE: Using virtual labs to understand the concept of matrix multiplication, call by reference

AIM: Use of virtual labs to understand the concepts and theory with examples and verify the same with practice questions.

Expected OUTCOME of Experiment:

Books/ Journals/ Websites referred:

- 1. Programming in ANSI C, E. Balagurusamy, 7 th Edition, 2016, McGraw-Hill Education, India.
- 2. Structured Programming Approach, Pradeep Dey and Manas Ghosh, 1 st Edition, 2016, Oxford University Press, India.
- 3. Let Us C, Yashwant Kanetkar, 15th Edition, 2016, BPB Publications, India.

Problem Definition:

Virtual Lab experiment on matrix multiplication https://cse02-iiith.vlabs.ac.in/exp/arrays/simulation.html

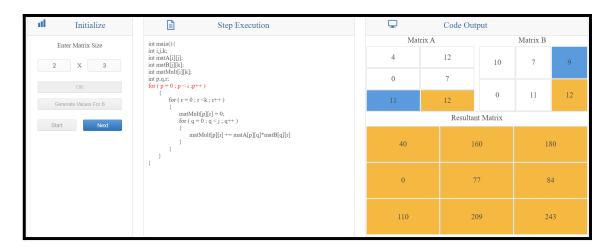
Virtual Lab experiment on Call by reference https://cse02-iiith.vlabs.ac.in/exp/pointers/procedure.html

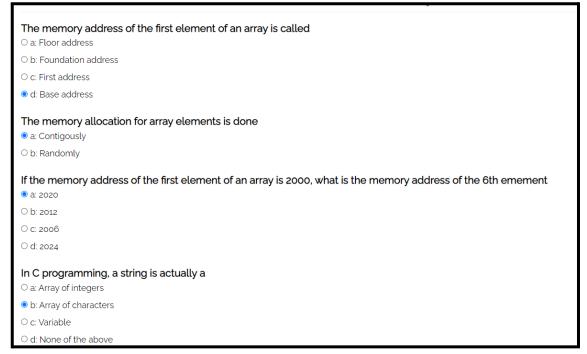
1. Matrix Multiplication.

Implementation details/ Simulation screenshots:

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2.Program to swap two numbers without using a third variable using Call by reference

Implementation details/ Simulation screenshots:

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```
#include-stdio.h>
void main() {
    int A = 5, B = 9;
    printft(Value of A after swapping is %d'u',A);
    printft(Value of B after swapping is %d'u',A);
```

```
void swap(int *, int *);
main()
∃ {
    int a, b;
    printf("a = ");
    scanf("%d", &a);
    printf("b = ");
    scanf("%d", &b);
    printf("Before swapping a = %d and b = %d\n", a, b);
    swap(&a, &b);
    printf("After swapping a = %d and b = %d\n", a, b);
     return 0;
void swap(int *a, int *b)
     *a = *a + *b;
     *b = *a - *b;
     *a = *a - *b;
```

Output(s)/Post-test Screenshots:

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```
a = 787
b = 877
Before swapping a = 787 and b = 877
After swapping a = 877 and b = 787
```

1 Pointer is a :
a: A keyword used to create variables
O b: A variable that stores address of an instruction
O c: A variable that stores address of other variable
O d: All of the above
2. If a variable is a pointer to a structure, then which of the following operator is used to access data members of the structure through the pointer variable?:
Ob:&
Οα·
⊕ d: →
3.The name of the array is a pointer to the element of the array. a. first
O b:second
Submit Quiz 3 out of 3
3 001 01 3

Conclusion and your take away after performing the virtual lab experiment: -

Two numbers are swapped using call by reference without using a third variable with implementation of proper logic.

Post Lab Descriptive Questions

- 1. Differentiate between Call by Value and Call by Reference.
- 2. Try to understand the working of pointers by Running the following code and noting down the output.

 main()

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```
 \begin{cases} & \text{int } i=3 \ ; \\ & \text{int } *j \ ; \\ & j=\&i \ ; \\ & \text{printf ( "\nAddress of } i=\%u",\&i \ ) \ ; \\ & \text{printf ( "\nAddress of } j=\%u",j \ ) \ ; \\ & \text{printf ( "\nValue of } j=\%u",j \ ) \ ; \\ & \text{printf ( "\nValue of } i=\%d",i \ ) \ ; \\ & \text{printf ( "\nValue of } i=\%d",*(\&i) \ ) \ ; \\ & \text{printf ( "\nValue of } i=\%d",*(\&i) \ ) \ ; \\ & \text{printf ( "\nValue of } i=\%d",*j \ ) \ ; \\ \end{cases}
```

Ans 1:

Sr. no.	Call by Value	Call by Reference	
1.	Value of the variable is passed.	Address Of the variable is passed.	
2.	Can't change the value of actual argument by using formal argument.	Can change the value of actual argument using formal argument.	
3.	No pointers are used.	Pointers are used.	
4.	Requires more memory.	Requires less memory.	
₅ 5.	It is less efficient.	It is more efficient.	

Ans 2:

```
Address of i = 6422300
Address of i = 6422300
Address of j = 6422296
Value of j = 6422300
Value of i = 3
Value of i = 3
Value of i = 3
```

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Date: _____ Signature of faculty in-charge

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