**A blue and yellow logo

Description automatically generated with low confidence San Francisco Bay University**

**Lab 7 Basic Programming Questions in C Language**

**Due day: 3/15/2023**

**Instruction:**

1. **Push the source code to Github or piazza platform.**
2. **Please follow the code style rule like programs on handout.**
3. **Overdue homework submission could not be accepted.**

**4. Takes academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. Find multiplication of two matrices.

*Output:*

*Enter 2-dimensional array size: 2 3*

*Enter numbers for each element in two arrays:*

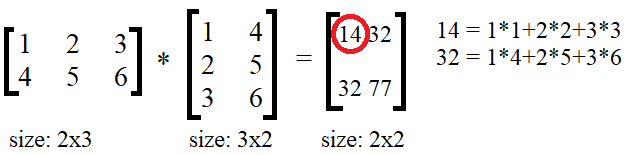
*1 2 3 4 5 6 1 4 2 5 3 6*

*Result after multiplication of two arrays:*

*14 32*

*32 77*

Hint: rule of multiplication for two arrays

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1. Swap two numbers by pointer

*Output:*

*Enter two numbers a & b: 2 3*

*After swapping by pointer, a = 3, b=2*

1. Study built-in functions "gets()", "puts() ","getchar()", "putchar()" in C language about string & char process. And then write program to input and output of a string

*Output:*

*Enter any string: hi everyone*

*Result: hi everyone*

1. Find factorial of a number using recursion

*Output:*

*Enter a number: 5*

*Factorial=120*

1. Study functions "strcpy()" and "strrev()" in C language, and then write a program to check if a string is palindrome or not

*Output:*

*Enter a string: abc*

*Result: not a palindrome string*

*Enter a string: radar*

*Result: yes, it is a palindrome string*

Hint: other examples of palindrome word, such as

refer, level, mom, madam, rotor, … …

1. Merging one-dimensional array - excluding repeating element

*Output:*

*Enter the size of 1st array: 3*

*Enter each element: 3 5 7*

*Enter the size of 2nd array: 3*

*Enter each element: 2 5 9*

*Result of merging: 3 5 7 2 9*

1. Write a program to print binomial coefficient table

*Output:*

*Enter the order of* [*binomial*](https://en.wikipedia.org/wiki/Binomial_(polynomial))[*power*](https://en.wikipedia.org/wiki/Exponentiation) *expression: 3*

*Results of printing on monitor:*

*1*

*1 1*

*1 2 1*

*1 3 3 1*

*Enter the order of* [*binomial*](https://en.wikipedia.org/wiki/Binomial_(polynomial))[*power*](https://en.wikipedia.org/wiki/Exponentiation) *expression: 6*

*Results of printing on monitor:*

*1*

*1 1*

*1 2 1*

*1 3 3 1*

*1 4 6 4 1*

*1 5 10 10 5 1*

*1 6 15 20 15 6 1*

Hint: [binomial](https://en.wikipedia.org/wiki/Binomial_(polynomial)) [power](https://en.wikipedia.org/wiki/Exponentiation) expression is like and binomial coefficients

e.g and coefficients: 1

and coefficients: 1 2 1

and coefficients: 1 5 10 10 5 1

1. Write a program to remove the duplicate element in an array

*Output:*

*Enter size of the array:5*

*Enter numbers for each element: 3 3 4 6 4*

*Results of removing duplicate: 3 4 6*

Hint: sort the array first, and then shift array if there is a duplicate element

1. Generate a program for finding the desired kth smallest element in an array

*Output:*

*Enter size of the array:7*

*Enter numbers for each element: 3 3 4 6 4 3 7*

*Enter desired kth smallest element: 3*

*Result of 3rd smallest element: 6*

1. Calculate standard deviation by C program

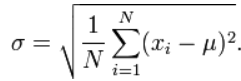
*Output:*

*Enter size of the array: 8*

*Enter numbers for each element: 10 12 23 23 16 23 21 16*

# *Result of Standard Deviation: 4.8989794855664*

Hint: calculation equation is as follows



Where μ is mean value

As below is the online S.D. calculator for your program debugging

[*https://www.calculator.net/standard-deviation-calculator.html?numberinputs=10%2C+12%2C+23%2C+23%2C+16%2C+23%2C+21%2C+16&ctype=p&x=82&y=17*](https://www.calculator.net/standard-deviation-calculator.html?numberinputs=10%2C+12%2C+23%2C+23%2C+16%2C+23%2C+21%2C+16&ctype=p&x=82&y=17)