Programming Fundamentals

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| **Lab-5** | |
| **Topic** | Basics of functions |
| **Objective** | Learning objectives of this lab is to be able to learn the purpose and usage of  functions. |

**Question 1:** Write a C++ program that calls a function print\_table(). The function is supposed to print the table of a user entered number till 6 on console.

# Sample Output:

Enter a number:3 3 \* 1 = 3

3 \* 2 = 6

3 \* 3 = 9

3 \* 4 = 12

3 \* 5 = 15

3 \* 6 = 18

**Question 2:** Write a C++ program which works as a basic calculator. Make a function calculator() that accepts two integer values and a character value. Your function should perform the operation on the entered integer values depending on the character value entered by the user and return the output to main().

Make sure to create separate functions **of sum(), subtraction(), multiplication()** and **division().** The function calculator() should be able to call the necessary function as required.

# Sample Output:

Enter Number 1: 100

Enter Number 2: 2 Enter Character: +

The result after addition is: 102

**Task-3:** Write a C++ program to evaluate the following expression using the same implemented functions as above. Also make sure to use find\_mul() where ever you feel the need to calculate square instead of creating a separate function for square.

𝑎2 + 𝑏2

To evaluate the above expression, you can only use following functions and no other function should be created:

int calcMul();

int calcSum();

**NOTE:** Copy paste the function of multiplication and sum which has been previously implemented.

# Sample Output:

Enter a: 10

Enter b: 2

Result is: 104

**Task-4:** Write a C++ program to evaluate the following expression using the find\_mul() function. And print the result through main.

3𝑎𝑏

**NOTE:** Copy paste the function of multiplication which has been previously implemented.

# Sample Output:

Enter a: 10

Enter b: 2

Result is: 60

**Task-5:** Write a C++ program to evaluate the following expression using the same implemented functions as above.

32 + 𝑎2 + 𝑏 + 3𝑎𝑏

To evaluate the above expression, you can only use following functions and no other function should be created:

int calcMul(); int calcSum();

**NOTE:** Copy paste the function of multiplication and sum which has been previously implemented.

# Sample Output:

**Sample Output:**

**Task 7:**

Enter a: 10

Enter b: 2

Result is: 171

1. Use the above function of sum which you have created in task-03. Now, using the same function you have to calculate sum of two arrays separately and display the results of each on screen from main.

# Sample Output:

Array1:2 3 4 5 6 1 2 1 2

Array2:2 3 1 2 1 3 1

Sum of array1 is: 26 Sum of array 2 is: 13

1. Make a function findmax that accepts the sum of arrays (calculated in previous step) and finds the maximum value.

# Sample Output:

Maximum value is: 26

**Task 6:**

Make a program that takes full name from user. Make a function check() that accepts the name. Function should display the index of vowels and return the total number of vowel present in array. To calculate the total number of vowels you can use the function of sum previously implemented.

# Sample Output

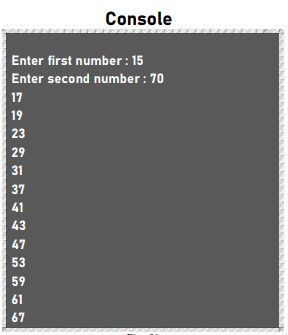
Enter Full name: ali ahmad Vowel is at index: 0 2 4 7

Total vowel: 4

**Question 7:**

Write a C++ program that has a function that receives two numbers as an argument and display all prime numbers between these two numbers. Call this function from main( )

**Output:**



**Question 8:** Use the readfile() function to read data from file “data.txt” into array. Make a function check() that accepts the array and calculates the frequency of even numbers. Display that number.

**Sample Output:**

Data.txt: 1 3 5 2 7 9 1 2 5 6 4 8 6 5 6

Output: First even number found:7

**Question 9:** Now Display the sum in main().

**Note:** Frequency means how many times it comes in file.

**Sample Output:**

Data.txt: 1 3 5 2 7 9 1 2 5 6 4 8 6 5 6

Sum is: 34

**Question 10:** Make a function readfile() that reads animal names from a file animal.txt into an array[]. ask user to enter name of an animal into name[]. Make a function check() that accepts array[] and animal that checks if animal entered by user is present in file or not. Display the output on console.

**Sample Output:**

Animal.txt: ratcowelephanthorselion

Output: Enter the name of an animal: horse Animal found

**Question 11:** Write a C++ program that contains three functions other than main, where

1. First function reads a number n and a power p,
2. Second function is trying to calculate the p power of a number n,
3. Third function is trying to display the calculated power by second function.
4. Main will call all the above functions.

**Question 12:** Write a C++ program that contains three functions other than main,

1. First function that reads a sentence using cin.getline from user.
2. Second Function that receives an alphabet and search it in the sentence and counts of its occurrences.
3. Third Function will display the count found by second Function.
4. Main will call all of the above functions.

**Question 13:** Write a C++ program that contains two functions other than main,

1. First function that reads a sentence using cin.getline from user.
2. Second Function that receives an alphabet and search if it’s occur consecutively in the sentence if yes then display the message “yes the alphabet has occur consecutively” otherwise display no consecutive occurrence found.
3. Main will call all of the above functions.

**Sample output1:**

Input a sentence: I am feeling lucky

Input alphabet whose consecutive occurrence you want to search: e

"Yes consecutive occurrence found"

**Sample output2:**

Input a sentence: Unexpectedly closed the connection

Input alphabet whose consecutive occurrence you want to search: s

"NO consecutive occurrence found"

**Question 14:** Write a C++ program that contains two functions other than main:

1. First function that reads a sentence using cin.getline from user.
2. Second Function that counts all the three letter words in a sentence entered by the above functions and return the count in main.
3. The third function will receive the count in its parameters from main and display the total three letter words found (if any).
4. Main will call all of the above functions.

**Sample output1:**

Input a sentence: I am feeling lucky "Sorry No three letter word found" **Sample output2:**

Input a sentence: Ahmed will call you in the morning Total of 2 three letter words found.

**Question 15:** Write a C++ program that contains two functions other than main,

1. First function that reads a sentence using cin.getline from user and alphabet to serach in the sentence.
2. Second Function that receives an alphabet alongwith sentence and search if any of the word in the sentence starts with that alphabet if yes then display that word on screen and repeat the process for the next word till the end of the CString else display the message “no word in the given sentence starts from the given alphabet”. (Note: Your code should deal capital and small alphabets as same, means not case sensitive).
3. Main will call all of the above functions.

**Sample output1:**

Input a sentence:

Technology can be most Broadly defined as the entities, both material and immaterial

Input alphabet to search: b Output: Words starts with b/B are:

be Broadly both

**Sample output2:**

Input a sentence:

Ahmed will call you in the morning

Input alphabet to search: d

Output: Words starts with d/D are: