National University of Computer and Emerging Sciences

Lab Manual # 9

Programming Fundamentals

(Section BCS-1H1&1H2)

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Sections	BCS-1H1 & 1H2
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Objectives:

After performing this lab, students will be able to solve programming problems using

Int arrays

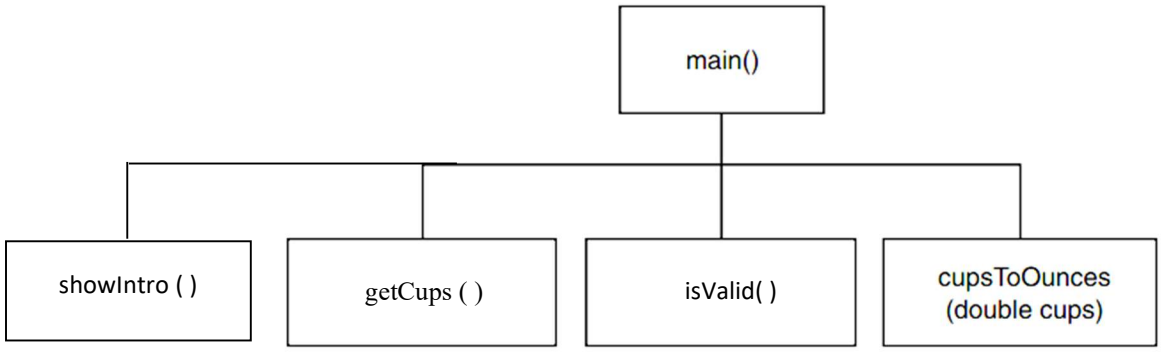
Functions

40 marks

Question no 1: Return Values from functions

Write a simple program that converts cups to fluid ounces. You will display an introductory screen that explains what the program does. Get the number of cups and check if the input is valid or not. If input is valid convert the number of cups to fluid ounces and display the result otherwise exit the program.

The hierarchy chart shown in Figure shows how the program will broke down into functions.



As shown in the hierarchy chart, the main function will call four other functions. Here are summaries of those functions:

- showIntro: This function will display a message on the screen that explains what the program does.
- getCups: This function will prompt the user to enter the number of cups and then will return that value as a double.
- isValid: This function will check if the input is valid and return true or false.
- cupsToOunces: This function will accept the number of cups as an argument and then return an equivalent number of fluid ounces as a double.

Question no 2: Function with parameter passed by reference

Write a program in C++ (using function with parameter passed in by reference) for finding the character grade against marks out of 100. The character grade is determined as follows:

If the marks are more than 80 the grade is A
If the marks are more than 65 but less than 80 the grade is B
If the marks are more than 50 but less than 65 the grade is C
If the marks are less than 50 the grade is F

The function's signature should be as follows:

void calculateGrade(int marks, char &grade)

The driver program should include a loop that lets the user repeat the grade calculation until the user enters -1.

Question no 3: Function with parameter passed by value

Implement the following function in C++ called that takes in as input a number N and prints the first N number of the Fibonacci sequence. Please also write the driver program for N = 10 and 15.
void fibonacciSeries(int n).

Question no 4: Array searching

Write a binarySearch function which performs a binary search on an integer array, which has a maximum of size elements, and is searched for the number entered by the user. If the number is found, its array index is returned. Otherwise, -1 is returned indicating the value was not in the array.