DAA ASSIGNMENT -1

Problem Statement -

Design and implement a C library for integers of arbitrary length. It should have functions to read and print “intal” and mathematical operations on “intal”. The integer could be positive,negative or zero.

The following functions are to be implemented on “intal” :

1. Add two integers of arbitrary length

2. Subtract two integers of arbitrary length.

3. Multiply two integers of arbitrary length.

4. Divide two integers of arbitrary length.

5. Exponentiation limited to positive power.

REPORT -

APPROACH -

I have used the “intal” framework that was given. What I have basically done is converted each of the intal structure’s character array into an integer array with each array element having one digit taking into consideration the sign. And then performing operations to these integer arrays and storing the result as well in the integer array. The appropriate sign is introduced into the character array when inserting into the intal structure.

There are 2 files containing the code -

1. The header file that has all the function prototypes.

2. The implementation file that has all the function implementation and all necessary helper functions required for these functions.

There is another file intal_demo.c that contains the main function and helps demonstrate the functionalities of the C code for implementing arithmetic and power operations on integers of arbitrary length. In this file I have taken 4 arbitrary intals i1,i2,i3,and i4 and

performed arithmetic operations on these intals. I have also printed the contents of each of these intals and the results of the arithmetic operations on these intals.

In the zip file I have also included a screen shot of the output for these 4 arbitrary length integers.

LEARNING -

By doing this assignment, I have learned a great deal about what goes into creating a library of functions for some data type. I have also learned the professional way of coding which until now was alien to me. I have now learned that all the code is not dumped into one single file. There are multiple files for these that include a separate header file, a separate implementation file, agreed function prototypes and interfaces, a help file that enables a new user to use the library to make their life simpler and enabling reuse of code which is the main purpose of introducing functions and procedures into programming languages. I have also learned a great deal in handling character arrays in c which always used to be a headache until now and also how to handle segmentation faults and how to debug faulty code and also about the amount of work that goes into making a library of functions which until now seemed to be very simple and easy. I would like to thank CB sir for giving us this topic. I would also like to convey to him that I understood that coding is indeed not an easy task, and it takes practice to master at it and the joy of getting the right working code is simply next level.

By -

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