

CS559: Computer Systems Lab

READ THE FOLLOWING INSTRUCTIONS CAREFULLY. FAILING TO ADHERE TO IT WILL LEAD TO DEDUCTION OF MARKS.

1. Make sure to give the correct information in your submission link. You will receive a response email for every submission. **You must save it for future reference for the whole semester as you will be asked to show it.**
2. Every assignment will have multiple questions. **For every question, you will save your solution (i.e. program) as a .c file.** So if “Assignment 01” has 4 questions (marked as 1, 2, 3 and 4), then you will save your solution program as 1.c, 2.c, 3.c and 4.c.

Note: Your program will be compiled to check if your solution is correct and you will be marked accordingly. If any solution file is missing or not submitted, the marks for that solution will be **zero**.

3. Submit your files in a compressed folder (rar or zip) as per “submission instructions” given in your assignment question paper.

Note: You must make sure to upload in .zip or .rar. **Folders submitted with any other extension or wrong extension will not be evaluated and awarded zero.**

4. The student must ensure that the submitted file is not corrupted and can be unzipped properly. **Corrupted files that cannot be opened will be given zero. Similarly bad filenames having any other extension than “.c” will not be evaluated and given zero.**
5. You will be able to upload your assignment multiple times within the deadline span, but only your last submission will be treated as final and considered for evaluation. **No plea/request to consider intermediate submissions for evaluation will be entertained.** So, make sure to carefully check that you are submitting the correct assignment.
6. The submission link will be automatically deactivated after the deadline, and no request/plea for extension will be accepted. **Non-submission /wrong submission will be automatically awarded zero.**
7. Your code will be checked for similarity and you will be penalized according to the following rule:

Similarity above 75%: 50% deduction

Similarity of 100%: full deduction

8. **Compiler Information: Program must be compiled using online gdb compiler. If your program can not be compiled using gdb compiler then marks will be reduced.**
Compiler Link : https://www.onlinegdb.com/online_c_compiler
9. **Marks for every assignment (other than practice assignments) will be mailed to you with remarks. You will be allowed a deadline for rebuttal, after which no rebuttal will be entertained.**

CS559: Computer Systems Lab

Date: August 04, 2022

Assignment 2

Submission deadline: August 04, 2022 - 1200 Hrs. IST

Submission Instruction: Store your assignments in folder and compress it as a rar/zip file (filename should be in this format: `roll-number_assign2.rar` or `roll-number_assign2.zip`). For example, if your roll number is 2211CS01, store your assignment as 2211CS01_assign2.rar or 2211CS01_assign2.zip. Also, save each program in the format given beside each question. Upload the same at the below link:
<https://forms.gle/HYiULZHXyBVzsw517>

Problem 1 (Save as 1.c) :- A number is said to be in Binary Coded Decimal (BCD) representation if every digit in its decimal representation is replaced by its 4 bits binary representation. Check if it can be represented in its BCD form given N bits available in any computer system to store its data. For example, 279 can be represented by “0010 0111 1001” considering that the computer system supports 16 bits for storage of data. Also, find the BCD representation of the decimal number. (Use bitwise operators) [3 points]

Sample input:

Number of test cases: 2

Bits available? : 16
Decimal Number: 541

Bits Available? : 8
Decimal Number: 425

Expected output:

BCD equivalent: 0101 0100 0001
BCD equivalent: cannot be represented

Problem 2 (Save as 2.c) :- Write a program to add two BCD numbers. (**Note:** proper logic should be present in the program and output should be in the format stated below) [4 points]

Sample Input:

Number of test cases: 2

First number: 9
Second number: 4

First number: 19
Second number: 14

Expected Output:

9 (1001) + 4 (0100) = 13 (0001 0011)

19 (0001 1001) + 14 (0001 0100) = 33 (0011 0011)

Problem 3 (Save as 3.c) :- Write a program to subtract two BCD numbers. (**Note:** proper logic should be present in the program and output should be in the format stated below) [4 points]

Sample Input:

Number of test cases: 2

First number: 835

Second number: 274

First number: 429

Second number: 476

Expected Output:

835 (1000 0011 0101) - 274 (1101 1000 1011) = 561 (0101 0110 0001)

429 (0100 0010 1001) - 476 (1011 1000 1001) = -47 (- 0000 0100 0111)