

# Indian Institute of Technology Kharagpur

AUTUMN Semester, 2015

COMPUTER SCIENCE AND ENGINEERING

CS19001: Programming and Data Structure Laboratory

Laboratory Test – 1

Full Marks: 30

Time allowed: 3 hours

**INSTRUCTIONS:** This question paper contains three questions, each carrying equal marks. ANSWER ALL QUESTIONS. Please see the questions and write the corresponding C programs step by step. Please comment your code liberally, and give proper indentations. Strictly follow the instructions given. All these features are necessary and absence will lead to deduction of marks.

Please do not forget to upload the solution files to *Moodle* before you leave. FILES CAN BE UPLOADED ONLY AFTER THE EXAM ENDS.

1. Write a C program to print the number of occurrences of the space, tab and newline characters in a piece of text entered by the user through the keyboard. Note that the user should be able to enter multiple lines of text. DO NOT USE ARRAYS. Your program should output the number of tabs, number of spaces and number of newlines in the text entered. Hint: use the `while ((c = getchar()) != EOF)` construct. (10 marks)
  2. Two elements  $a[i]$  and  $a[j]$  of an array form an “inversion”, if  $a[i] > a[j]$  and  $i < j$ . Write a C program to count the number of inversions in an array with 10 integers. The user will enter the values in the array through the keyboard, and your program will output the number of inversions in the array. Example: the array {2, 4, 1, 3, 5} has three inversions: (2, 1), (4, 1), (4, 3). (10 marks)
  3. A “palindromic number” is a number that remains the same when its digits are reversed, e.g: 16461. Write a complete C program to check whether a positive integer entered by the user is a palindrome or not, using the C function `int is_palindrome (int number)`. Your program should print whether the number is palindrome or not from the `main()` function. (10 marks)
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