Indian Institute of Technology Kharagpur

AUTUMN Semester, 2015
COMPUTER SCIENCE AND ENGINEERING

CS19001: Programming and Data Structure Laboratory

Assignment − 3

Full Marks: 10

Time allowed: 3 hours

INSTRUCTIONS: Please see the questions and write C programs step by step. Ensure proper indentations to improve the readability of your code. All these features are necessary and absence will lead to deduction of marks.
Please do not forget to upload files to *Moodle* before you leave.

Looping Statements in C

1. Write a C program to find and print the approximate numerical value of the mathematical constant π, using the technique taught in class. The user will input the maximum number of iterations. (3 marks)

2. Write a C program to calculate the value approximate numerical value of $\sin(x)$, where the argument "x" (in radians) is a double-precision floating point number entered by the user. Use the relationship between the $(n+1)$-th and n-th term of the Taylor series expansion of $\sin(x)$ in your program. Use the "do....while" construct. Stop the iterations using the "break" construct once the difference between the absolute values of two consecutive terms becomes less than 0.001, and print the value obtained. (3 marks)

3. The *Fibonacci Series* is the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, $\cdots$. The starting numbers are 0 and 1, and the next numbers in the series is found by adding up the two numbers before it. Write a C program to print the numbers that do not appear in the Fibonacci series. The user will input the number of terms $(n > 2)$ in the Fibonacci sequence to be considered. For example, if the user enters $n = 7$, the values to be printed are: 4 6 7. (4 marks)