INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY
THIRUVANANTHAPURAM 695 547

First Year B. Tech. - Assignment Sheet
MA122-Computer Programming and Applications

19.03.2017 **Maximum Marks: 10** **Assignment Sheet 10**

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a. Implement the *bisection* method for solving equations. Use the following function:

```
double root(double (*pf)(double x), double a, double b, int n).
```

Here, `pf` points to a function f that defines the equation $f(x) = 0$ that is to be solved, a and b bracket the unknown root x (i.e., $a \leq x \leq b$), and n is the number of iterations to use. For example, if $f(x) = x^2 - 2$, then `root(f,1,2,100)` would return 1.414213562373095 ($=\sqrt{2}$), thereby solving the equation $x^2 = 2$. The bisection method works by repeatedly bisecting the interval and replacing it with the half that contains the root. It checks the sign of the product $f(a)f(b)$ to determine whether the root is in the interval $[a, b]$.

b. Write an overloaded function *area* which calculates the area of rectangle with sides a and b, and square with side a. Also, consider two types for the sides: *int* and *float*.

Program submission:

Name the programs as XXXA10Y.cpp, where XXX is the last three digits of your student id and Y is program number. For example, if the student id is 'sc17b150' and your program number is 'a' then the file name should be 150A10a.cpp. Submit the programs using ftp to the server: 172.20.2.200