

**Concordia University
Department of Computer Science
and Software Engineering**

**COMP 354 --- Software Engineering I
Fall 2005**

Homework Assignment #3

Instructions

- This is an individual assignment.
- Similar questions (among others) will be asked in the quizzes.

1. [40 points] You have been given a program that was written according to the following specification:

- The program reads three real numbers, A, B, and C.
- Suppose that L is the line whose equation is $Ax+By+C=0$ and that O is the circle whose equation is $x^2+y^2=1$.
- The program writes "*L is outside O*" or "*L touches O*" or "*L intersects O*" depending on whether the number of points that L and O have in common is 0, 1, or 2.

Describe how you would test this program. Give precise examples of test data, not vague ideas such as "*choose A, B, and C so that L touches O*". Hint: the line intersects the circle twice if $A^2+B^2>C^2$.

2. [20 points] Find three different forms of coupling in the design or code of the class project. For each case, explain what kind of coupling it is (see course notes for a classification of kinds of coupling), and discuss whether this is good or bad coupling and why. If it is bad coupling, explain how it could be made better.

3. [40 points] Select one relatively complex and important function (i.e. a function that would require such testing) in your term project's design or implementation. Explain why this function requires such testing. Apply equivalence partitioning testing to this function, as well as basis path testing. Clearly explain your approach, and derive all test cases and expected results for this function for both testing approaches.