CS/Math 240: Intro to Discrete Math 4/3/2011

Grading Key for Midterm 2

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Problem 1 (5 points)

- Part 1 - 3 points
- Part 2 - 1 point
- Part 3 - 1 point

Problem 2 (5 points)

- Part 1 - 1 point
- Part 2 - 1 point
- Part 3 - 2 point
- Part 4 - 1 point

Problem 3 (2.5 points)

- Part 1 - 1.5 point
- Part 2 - 1 point

Problem 4 (5 points)

- Part 1 - 1 points
- Part 2 - 2 points
- Part 3 - 2 points

Problem 5 (2.5 points)

- 0.3 points for every correct answer
- 0.1 point for attempting

Extra Credit Problem (2 points)

- Part 1 - 0.5 points
- Part 2 - 0.5 points
- Part 3 - 1 point

Common Mistakes

- For problem 1, part 1, giving the invariant as i $\leq$ m $\leq$ j is not sufficient to prove partial correctness.Also, you are required to state an invariant that is strong enough to show that BinarySearch() returns the first appearance of x in A. You should be careful not to make an assumption that the elements of A are distinct; "x does not appear in A[0...i] or A[j+1...n-1]" is an example of a wrong invariant which makes that assumption.
- For problem 1, part 3, if a check for A[m] = x is made before the recursive call then the index m returned will not necessarily be the index of the first occurance of x in the array.
- On problem 2c, you need to argue that gcd(b, a(b+1)) = gcd(a, b). Also a proof of partial correctness and termination is essential to prove that the algorithm works.
- For problem 3, just mentioning the recurrence relation is not sufficient. You need to argue how you arrived at the recurrence relation.
- On problem 4a (the Fibonacci algorithms), some students mistook the array references for recursive calls, and as such came to an incorrect answer for this problem.