MATH/CSE 1019: Discrete Math for Computer Science, Fall 2011

Assignment 4 (Released November 25, 2011)

Submission deadline: 7 pm, December 5 2011

Notes:

1. The assignment can be handwritten or typed. It MUST be legible.
2. You must do this assignment individually.
3. Submit this assignment only if you have read and understood the policy on academic honesty on the course web page. If you have questions or concerns, please contact the instructor.
4. Use the dropbox near the CSE main office to submit your assignments, OR submit your assignment online using the submit command from a CSE machine (follow instructions on the class webpage). No late submissions will be accepted. Please do not send files by email.

Question 1

Let $f(n)$ denote the n^{th} Fibonacci number. Prove that for any positive integer n,

$$f(1)^2 + f(2)^2 + \ldots + f(n)^2 = f(n)f(n+1).$$

Question 2

Using loop invariants prove that the following program for computing factorials is correct.

```
F(y)
1  x ← 1
2  while y > 1
3  do x ← x * y
4       y ← y − 1
5  return(x)
```