

MATH/CSE 1019 Discrete Math for Computer Science

Assignment 6

Released: Nov 12, 2012

Due: 1 pm, Nov 20, 2012

Notes:

1. No late submissions will be graded.
2. Submit your assignment using the dropbox, which is located on the 1st floor of LAS.
3. You must do the assignment by yourself
4. 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.

Questions:

1. (7 points) Use mathematical induction to prove

$$\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \dots + \frac{1}{n(n+1)} = 1 - \frac{1}{n+1}$$

whenever n is a positive integer.

2. (7 points) Use loop invariant to prove that the program for computing the sum of $1, \dots, n$ is correct.

```
INPUT: Integer n
OUTPUT: The sum of 1,...,n

S(n)
1. i ← 0
2. while n>0
3.   do i ← i+n
4.     n ← n-1
5. return(i)
```