

Homework 4

Problem 4.1

Solution:

Verification:

a) **Factorial:**

Pre Condition: $P(n) := n > 0$

Post Condition: $Q(n, product) := n! == product$

Loop invariant: $I := product == (factor - 1)!$

b) **Euclidean Algorithm:**

Pre Condition: $P(m, n) := m > 0, n > 0$

Post Condition: $Q(m, n, x) := x == GCD(m, n)$

Loop invariant: $I := GCD(x, y) == GCD(m, n)$