Homework 6: Program Verification

Submission policy. Submit your answers on paper **before** the class starts on **Monday**, March 2, 2020. No late submissions accepted.

1. Handwritten answers are fine but please make sure they are readable.

2. Your name should be printed at the very top of the document.

Administration. This assignment will be graded by the GTA.

Practice Questions – Do NOT submit these.

Textbook questions 6.2, 6.3, 6.4, 6.5, 6.6

Question that will be graded. Total Points 100.

Exercise 1.
[100 points].

Consider the following pseudo-code. Assume n is an integer, and $n \geq 0$ at the beginning of its execution.

$i \leftarrow 0;$
$z \leftarrow 3;$
while $(i < n)$ do
$\qquad i \leftarrow i + 1$
$\qquad z \leftarrow z * z$

(1) State the loop invariant.

(2) Prove the loop invariant.

(3) Apply the loop invariant.