

CS 330 (Fall 2013), Professor: Carlotta Domeniconi
Quiz 5

Student's name:

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  
     $i \leftarrow i + 1$   
     $z \leftarrow z * z$ 
```

(1) State the loop invariant.

(2) Prove the loop invariant.

(3) Apply the loop invariant.