

**CSCE 330 Fall 2009**  
**QUIZ 6**  
Assigned Wednesday, 09-10-14

1. Recall that, in denotational semantics, the *state* is a triple  $\langle \text{mem}, i, o \rangle$ .
  - (a) Which component(s) of the state are changed by a *read* instruction?  
**Answer:**  $i, \text{mem}$
  - (b) Which component(s) of the state are changed by a *write* instruction?  
**Answer:**  $o$  (only)
  - (c) Which component(s) of the state are changed by an assignment?  
**Answer:**  $\text{mem}$
  
2. What is the denotational semantics of the following program, where the initial input stream contains only the integer  $z$ ?

```
read(n);  
i := n+1;  
write(i);
```

Hint: it is a very short answer!

**Answer:**  $\langle z+1 \rangle$ . Also acceptable:  $z + 1$ , although technically the answer is a sequence.