## **CS10 Spring 2017 Quest Answers**

**Question 1**: How does calling the right pedal in a car the "gas pedal" relate to Abstraction best? "You're not supposed to know how things are done *below the line*, it's an *Abstraction Violation*." since my car is now electric and the right pedal sends more current to the motors, nothing to do with gas anymore!

**Question 2:** What is the *decimal* value of the expression:  $1E_{16}$  (hex) ÷  $10_2$  (binary)?  $1E_{16} = 1 \times 16^1 + (E)14 \times 16^0 = 16 + 14 = 30_{10}$ .  $10_2 = 1 \times 2^1 + 0 \times 2^0 = 2_{10}$ . So  $30_{10} \div 2_{10} = 15_{10}$ .

forever

else

if can move left?

if can move forward?

move forward 1

rotate left

**Question 3:** If the output from **mystery** is true, which can you say *for sure*? model? A must be false, B must be false

**Question 4:** You realize you could replace the *entire* body of the predicate with a single **report**. What should go in that report block? "(not A)and(not B)", "not(A or B)"

Question 5: Which of the following is a false statement about Algorithms? Proving

algorithms are correct is easy

**Question 6:** Given a list (of size N) of ID numbers well in advance, and infinite storage, what's the running time of an algorithm to find whether *two particular* IDs are in the list?

Constant.

Question 7: Given the following error-free expression

```
Foo join hello B + contains A , what is the
```

Domain and Range of Foo? Domain=sentences, Range=lists

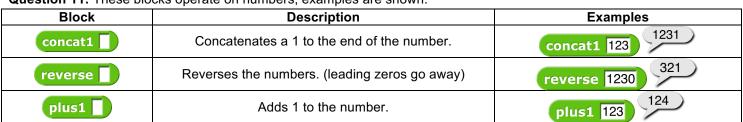
Question 8: We control the robot using the forever block on the right.

On the maze, fully shade in all the squares that the robot will visit. Keep going right. The insight is that when the robot hits the wall, it reports "can move left" THREE times, effectively making a right.

Question 9: After 100 iterations, does the robot continue to move or stay in place? Stays in place.

**Question 10:** Does the robot ever move into a black (non-free) square? No.

**Question 11:** These blocks operate on numbers; examples are shown:



What is reverse plus1 concat1 12 ? concat1(12)→121, plus1(121)→122, reverse(122)→221

Question 12: Which of the following are values of A, B and C to show that smallest of three A B a bug? A=1, B=3, C=2

Question 13: Which are true about smallest? It works when the first element (which we'll call the "head") is smallest, it

works when the first one smaller than the head is smallest

Question 14: Running time of smallest? Linear

