

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) $\div 10_2$ (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 $30_{10} \div 2_{10} = 15_{10}$.

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:

Block	Description	Examples
concat1	Concatenates a 1 to the end of the number.	concat1 123 → 1231
reverse	Reverses the numbers. (leading zeros go away)	reverse 1230 → 321
plus1	Adds 1 to the number.	plus1 123 → 124

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 C** has 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**

