






Question 1 : As a gift for your sweetie for Valentine’s Day, you hire someone to build you a hot tub in your backyard. As you’re about to enter the negotiation with the contractor, your sweetie reminds you: “don’t forget the importance of functional abstraction!” IN ONE SENTENCE, what do they mean in this context? (*Hint: Imagine you writing the spec for the **Build-Hot-Tub** block*)

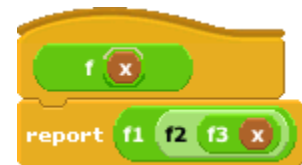
Question 2 : Someone claims to have created the most realistic procedural skin surface texture ever made. They say “and here is our *Cornell Box* test to prove it.” IN ONE SENTENCE, what are they about to show?

Question 3 : The Supreme Court is wrestling with an issue regarding the state of California and video games. IN ONE SENTENCE, what is it?

Question 4 : *Blown to Bits* begins with a story of Tanya Rider who was rescued after 8 days of being trapped under her car. The book says you’re supposed to say it’s really a story about “bits.” IN ONE SENTENCE, what were the specific bits that saved her life?

Question 5 : Finish the sentence: “To show you why BYOB can feel like it’s a mostly _____ programming paradigm, I’d probably show you code with _____”.

Question 6: Suppose we wish to compute the mathematical function $f(x) = 7 * (x - 5) * (x - 5)$, and we have already been given the block definition on the right. Your job is to define the three helper blocks below so that  is computed correctly. Each of the blocks below should perform at MOST one computation of the form , ,  or . You don’t have to draw images of the blocks, just the expression, e.g., `num + 99`



		
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Question 7:

You wish to author a command

Sing Valentines Day Song 

that takes as input a list of items, and has the sprite sing a song that describes what your true love gave you on that particular year (which, for year N, is N copies of the item in item N of the list, and all the things that were given last year). Example: If the list on the right were passed in as input, here's what song the sprite *should* sing to the user:



```
On anniversary # 1 of Valentine's day, my true love gave to me...
    1 partridge in a pear tree
On anniversary # 2 of Valentine's day, my true love gave to me...
    2 turtle doves
    1 partridge in a pear tree
On anniversary # 3 of Valentine's day, my true love gave to me...
    3 french hens
    2 turtle doves
    1 partridge in a pear tree
Whew! that's a lot of gifts!
```

a) What's the order of growth of **Sing Valentines Day Song** ? _____

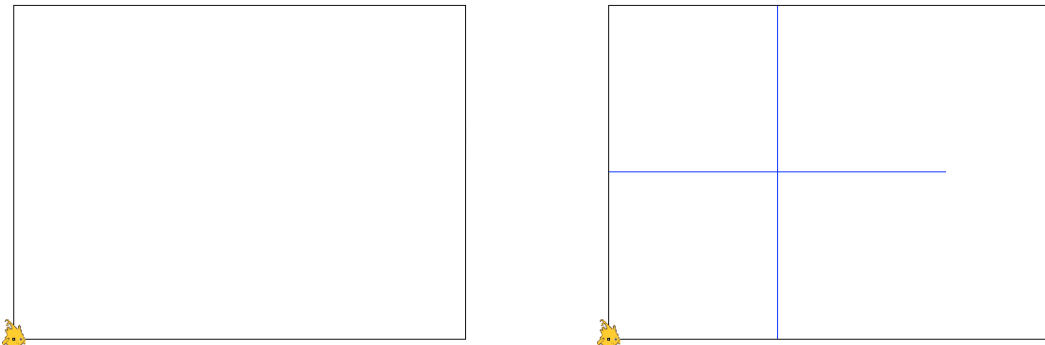
Unfortunately, we have a bug in the code on the right:

b) Let's say we pass in the original 3-element list as input again. Indicate how the song above would change by crossing off whatever lines wouldn't be said (or changing them, or adding some, as necessary) in the box above.

c) Indicate (by writing directly on the code) a small change that fixes the bug.



Question 8: You write the command `Draw+` that draws a “+” sign of a specified *size* and restores the original position of the sprite after it’s done. For example, here’s the stage before and after a call to `Draw+ 360`: (the height of the stage is 360)



In the stage below, draw what would result if we started the sprite at the same lower-left corner, but instead of calling `Draw+ 360`, we called the following script:

```

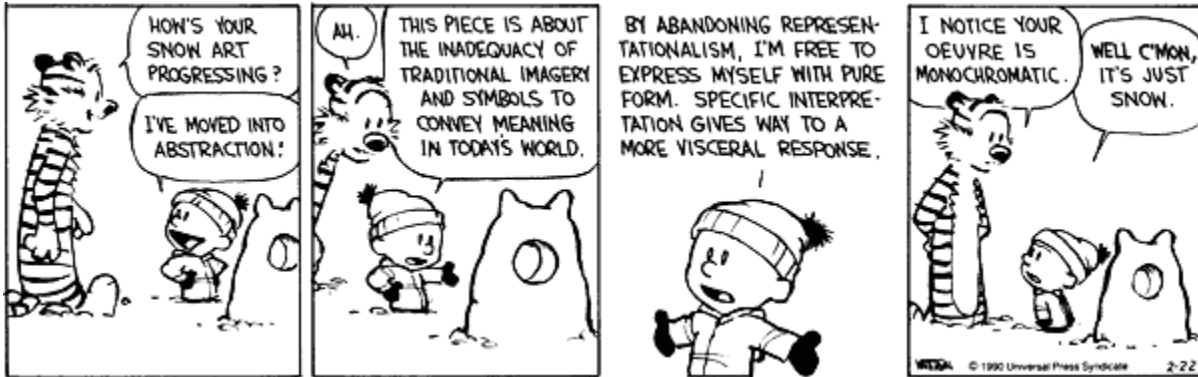
script variables size
set size to 360
repeat until size < 1
  Draw+ size
  set size to size / 2
hide
  
```



8. In the stage below, draw what would result if we started the sprite at the same lower-left corner, but instead of calling `Draw+(360)`, we called the script below.



UCB CS10 (Spring 2011) Quest Answers



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Question 1 : That you shouldn't tell the contractor HOW to build it, only WHAT you want via a clean specification with inputs (money, plans) and output (built hot tub). I.e., if they decided to build it with their bare hands, or hire a ton of helpers, or have it drop-shipped via airplane, or use one of their three genie wishes and have it magically appear, you shouldn't care. [2 pts]

Question 2 : They're going to show you their simulation and real skin, and hopefully you won't be able to tell the difference!

Question 3 : It's deciding whether California's law banning the sale of video games to kids under 18 violates first amendment rights.

Question 4 : Her cell phone was sending bits of information indicating her last location, and the police used that to locate her (after suspecting her husband of foul play).

Question 5 :

- Functional, a composition of reporter blocks that call other helper reporter blocks and have no assignment or local state
- Imperative, assignment statements with local state
- OOP, sprite-sprite communication via broadcast, message passing and explicit calling of blocks within sprites
- Declarative, lots of "what" factual statements, and a query, and no specific "how-to" code

Question 6:

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Question 7:

- a) Quadratic
- b)

On anniversary # 1 of Valentine's day, my true love gave to me...
1 partridge in a pear tree
On anniversary # 2 of Valentine's day, my true love gave to me...
2 turtle doves
1 partridge in a pear tree
On anniversary # 3 of Valentine's day, my true love gave to me...
3 french hens
2 turtle doves
1 partridge in a pear tree
Whew! that's a lot of gifts!

- c) Move the "set i to day" right above the "repeat until i = 0" block:

```
Sing Valentines Day Song gifts
script variables i day
set day to 1
repeat length of gifts
  say join On anniversary # join day of Valentines day, my true love gave to me... for 1 secs
  set i to day
  repeat until i = 0
    say join i join item i of gifts for 1 secs
    change i by -1
  change day by 1
say Whew, that's a lot of gifts! for 2 secs
```

Question 8:

