

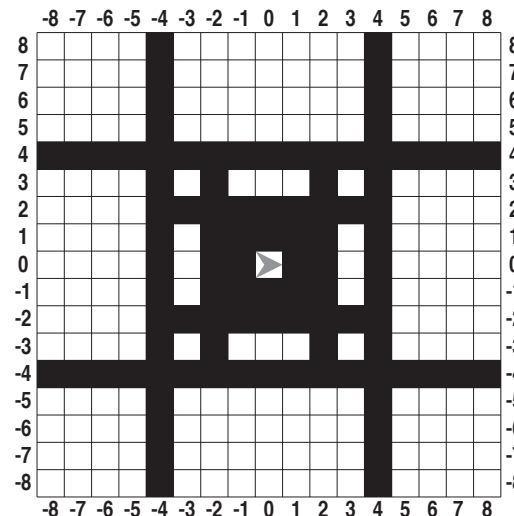
# CS10 Spring 2017 Midterm 2 Answers

Mystery 8

Question 1a: Shade in *all* the pixels that are filled in after

Question 1b: What's the running time of **Mystery**? **Logarithmic, because length halves every time. So even if length were 2048, there would only be 10 iterations!**

Question 2a: GAJEHGBG



```

how many cascades of f λ on arg until pred λ
script variables answer
set answer to 0
repeat until call pred with inputs arg
  set arg to call f with inputs arg
  change answer by 1
report answer
    
```

Question 2b:

```

numbers 1 to n #
report
  cascade n - 1 times item 1 of [ ] + -1 in front of [ ] on
  list n
    
```

Question 2c:

```

9s n #
report map 9 x over numbers 1 to n
    
```

Question 2d: The smallest number for 3 steps is one whose digits sum to 99 (the smallest recursion level 2 case), so that's 11 9s, or "99999999999".

Question 3: They are all possible. The secret to this question is that you can drop a zero by reversing a multiple of 10 (as in the example, 1230 becomes 321). That's easy for even numbers, since you can just get to a multiple of 10, then reverse it twice to drop the 0. For odd numbers it seems impossible, but all you need to do is add 2 until your most significant digit is even, then reverse it, and you're all set (just add 2 until you get to 700 or 7000 etc and reverse it).

```

reverse plus2 68 plus2 plus2 plus2 reverse plus2 plus2 6
reverse cascade 299 times plus2 on
reverse reverse cascade 96 times plus2 on 9
reverse 2 x 2999 + reverse 2 x 445 + 1111
    
```