

Question 1 : In a hybrid car, the electric motor can also serve as a generator to recharge the battery, by letting the wheels turn the motor instead of the other way around. This takes energy away from the wheels, slowing the car. To make this happen, you push the brake pedal. But you're not really applying the brakes -- you're charging the battery from the car's energy of motion. In one sentence, why didn't they make a separate control for this, instead of giving an extra meaning to the brake pedal?

Question 2 : In one sentence, what was the main point of Luis von Ahn's *Games With a Purpose (GWAP)* project, and what was one example?

Question 3 : Aside from the commonly-cited (and debated) increase in violent behavior, what is another negative aspect of video games?

Question 4 : In one sentence, refute either of the following statements with a simple example from the reading: "*Technology is Good, with no downsides*" or "*Technology brings opportunities with no risks*"

Question 5 : Of the four we mentioned, which is the most powerful programming paradigm?

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Question 6: Draw the shape that results from the following code:

```
set num to 0
repeat 6
  change num by 1
set sides to (21 mod 17) + num mod 3
pen down
repeat sides
  turn 360 / sides degrees
  move 50 steps
pen up
```

Question 7: You record the growth of a pandemic flu going around your city in the following table comparing the *total number of people with the flu (i.e., infected)* with that day.

| | | | | | |
|--------------------------|---|---|---|----|----|
| Day (input) | 0 | 1 | 2 | 3 | 4 |
| Infected (output) | 1 | 3 | 9 | 27 | 81 |

a) Write a block **Flu** to estimate how many people will be infected on any given day, based on the assumption that the number infected on any given day will be three times that of the day before. Your answer should be written in such a way that would allow another CS10 student to translate it into proper Scratch code. Here is an example of a call to **Flu**:



b) If, say, on day 15 the number infected is (shudder) exactly the same as the city's population, on what day will it be a *third* of the city's population?

Question 8 : The block below tries to find all the numbers in a list that are greater than a specific number, and put them in another list. However, there is one bug.

```
find all numbers larger than num in list and put them into other list
set index to 1
repeat length of list
  if item index of list > num
    add item index of list to other list
    change index by 1
```

a) What would the buggy block produce for the `other list` (which starts out empty) if you provided the list below as the input `list` and the number 4 as `num`? Write your answer beside the list.

| example | |
|---------|---|
| 1 | 5 |
| 2 | 4 |
| 3 | 3 |
| 4 | 6 |
| 5 | 2 |

+ length: 5

b) As the block is currently written, for a given `num`, write one sentence that describes *all* the lists that will **not** trigger the bug.

c) Describe how you would fix this so the block works as desired.