

Assignment 0

Due: Monday, July 1, 2019 - 10PM ‘Getting in the right head space’

Typed up answers submitted through git in a designated Assignment 0 Folder. Do NOT use the internet or any outside resources for any of the below questions. All work must be included.

- 1. How do you explain the meaning of ‘left’ and ‘right’ to an extraterrestrial over a phone? You and the alien both speak the same language. You are in different parts of the universe, so that you are out of each other’s observation range.**

a. To preface, I’m making the assumption that the extraterrestrial’s anatomy is similar enough to humans that it has two arms on either side of its body, and that the arms and hands are identical to those of humans. Here’s what I would say to the alien: Left and right are two directions that we use to guide our movements when searching for something, whether it’s a location or an object. If you are walking in a straight line, you can deduce which direction is left or right by using your hands. With each hand, make an “L” shape using your pointer finger and thumb. The hand that makes the regular “L” shape (from your point of view, and with the letter in mind) is your *left* hand, and when you turn and move your body in that direction, you are moving *to the left*. Likewise, the hand that makes the backwards “L” shape is your *right* hand, and when you turn and move your body in that direction, you are moving *to the right*.

- 2. How would you find the number of gas stations in the US? In the world? (you cannot look up any specific information, but you need yield an accurate answer)**

a. My method for figuring this out is meticulous and would require an immense amount of resources, but I believe it would still do the trick. In order to find the number of gas stations in the US and in the world, I would travel to the headquarters of all the gas/oil companies (first in the US, and then in the world) which create and oversee gas stations. While I would not be able to look up any information, I would be able to communicate with people. With this in mind, once at the headquarters, I would find the right person, sit down with them, and through our conversation, find out how many gas stations the company had posted in the US and around the globe, respectively. I would repeat this process at each subsequent gas/oil company’s headquarters.

- 3. You have 3 fruit baskets filled with fruit. All baskets are covered with zero visibility of the fruit inside the baskets. One basket has apples, one basket has oranges and one basket has a mix of both. All baskets are mislabeled. You have only one chance to take a sample from one basket and you are allowed only one fruit. The fruit will be handed to you so there will be no accidental ‘touching’ of other fruit. How would you figure out which baskets have which fruits?**

a. I would smell the baskets, for citrus has a very distinct and pungent smell, making it possible to know which baskets had oranges in them.

4. On a rainy summer day, brothers Dylan and Austin spend the day playing games and competing for prizes as their grandfather watches nearby. After winning two chess matches, three straight hands of poker and five rounds of ping-pong, Austin decides to challenge his brother, Dylan, to a final winner-take-all competition. Dylan clears the kitchen table and Austin grabs an old coffee can of quarters that their dad keeps on the counter. The game seems simple as explained by Austin. The brothers take turns placing a quarter flatly on the top of the square kitchen table. Whoever is the first one to not find a space on his turn loses. The loser has to give his brother tonight's dessert. Right before the game begins, Austin arrogantly asks Dylan, "Do you want to go first or second?" Dylan turns to his grandfather for advice. The grandfather knows that Dylan is tired of losing every game to his brother. What does he whisper to Dylan?
- Go second.
5. Following their latest trip, the 13 pirates of the ship, SIGINTIA, gather at their favorite tavern to discuss how to divvy up their plunder of gold coins. After much debate, Captain Code Breaker says, "Argggg, it must be evenly distributed amongst all of us. Argggg." Hence, the captain begins to pass out the coins one by one as each pirate anxiously awaits her reward. However, when the captain gets close to the end of the pile, she realizes there are three extra coins. After a brief silence, one of the pirates says, "I deserve an extra coin because I loaded the ship while the rest of you slept." Another pirate states, "Well, I should have an extra coin because I did all the cooking." Eventually, a brawl ensues over who should get the remaining three coins. The tavern keeper, annoyed by the chaos, kicks out a pirate who has broken a table and who is forced to return her coins. Then the tavern owner yells, "Keep the peace or all of you must go!" The pirates return to their seats and the captain, left with only 12 total pirates, continues to distribute the coins – "one for you," "one for you." Now, as the pile is almost depleted, she realizes that there are five extra coins. Immediately, the pirates again argue over the five extra coins. The captain, fearing that they will be kicked out, grabs the angriest pirate and ushers her out of the tavern with no compensation. With only 11 pirates left, she resumes distribution. As the pile nears depletion, she sees that there won't be any extra coins. The captain breathes a sigh of relief. No arguments occur and everyone goes to bed in peace. If there were less than 1,000 coins, how many did the pirates have to divvy up?
- "a"=total # of coins
 - "a" < 1000
 - "x"=coins per pirate
 - $px+r=a$, with p representing the number of pirates, and r representing the remainder (if any) of coins
 - $11x=a$
 - $13x+3=a$

g. $12x+5=a$

6. Beyond the obvious (Google, Facebook, etc.), what can computer science be used in?

How is it useful?

- a. Because technology is such a large part of our daily lives, computer science has many potential applications. For instance, a doctor could utilize the tools within computer science to try and identify types of diseases, so that s/he would be better able to help her/his patients.

7. What does it mean to write ‘good’ code?

- a. To write ‘good’ code is to write code which adequately solves a problem(s) and can be read and interpreted by other coders. It should also be code which the coder can explain and replicate, so that it’s clear that the coder understands *how* s/he’s using code to solve problems.

8. What is your prior experience in computer science?

- a. Very limited. I took a robotics class a couple of years ago, in which I was exposed to C for a short period of time. However, I did not retain any of that information, so computer science feels brand new to me.

How to submit

As mentioned above, assignment should be submitted through Git. Assignment must be converted to PDF first.