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.

I would tell the extraterrestrial to visual a number line that begins at zero and tell them that their position is at zero. The right side would be positive numbers and the left side would be negative numbers.

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

I would drive around the DFW area and determine the number of gas stations to extrapolate the number in US & world.

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 mislabelled. 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?

You would choose the basket that is mislabeled as "both" and you would get either an apple or orange. Let's say that you pull out an orange, you would know that the basket contains only oranges because it can't be the basket with both since it's mislabeled as 'both'. Now you have two baskets left that are

labeled 'apples' or 'oranges'. The one that is labeled 'apples' would contain both oranges and apples, while the 'oranges' basket will have apples.

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?

The grandfather will tell Dylan that it depends on the dimensions of the table. That if it's a 5x5 or a square with an odd number for the product of the dimensions, then he should go first. However, if the table is a 4x4 or a square with an even number for the product of the dimensions, then he should go first.

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?

I would write out all the multiples up to the digit 1,000 that 11, 12 and 13 have in common. Afterwards, I would find the multiple that satisfies the properties: being a multiple of 11 with a remainder of 0, has a remainder of five when divided by 12 and a remainder of 3 when divided by 13. The answer is 341.

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

Computer science can be virtually be used for anything because it can branch out to any field. It's an interdisciplinary subject that can be used in economics, statistics, robotics or for anything that includes some form of data. It's greatly useful because it teaches you to not only solve a complex problem, but to also think critically.

7. What does it mean to write 'good' code?

Writing 'good' code means having neat code that can be easily read, including notes that entail what certain things do and being concise.

8. What is your prior experience in computer science?

I have zero experience in computer science.

How to submit

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