Test - Data Analyst @Goin

1. Logical

A cube is painted Green on all six sides. It is divided into 125 (=5 x 5 x 5) equal smaller cubes. Find:

1.1 The number of smaller cubes having

a) 3 faces coloured?
b) Exactly 2 faces coloured?
c) Exactly 1 face coloured?
d) 0 faces coloured?

1.2 All 125 cubes are put into a bag. If a single cube is selected at random from the bag, find the probability of picking a cube having 1 or more Green faces

1.3 What is the average number of Green faces on a small cube? In the above situation N=5, (with N^3 =125)

1.4 For general N, give a formula for (b) the number with exactly 2 faces coloured

1.5 For what values of N is this formula correct?

2. Programming

2.1 Write a program in Python that prints the numbers from 1 to 100. But for multiples of three print "Hello" instead of the number and for the multiples of five print "There". For numbers which are multiples of both three and five print "HelloThere" instead.

2.2 Write a program in Python which calculates the sum of the first 10 Fibonacci numbers bigger than 1000. Which is the Big O notation of this algorithm? Can you code this algorithm so it follows a linear time complexity?

[Reminder: Fibonacci numbers are the following series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, … where each term is the sum of the previous two terms]

3. SQL

We have in our database a table for each of the Sessions that our users do and another table with information about their Goals:

Sessions				Goals		
session_id	user_id	session_start_time		goal_id	user_id	goal_start_time
1	A	13/07/2020 12:34:32		1	A	13/07/2020 12:38:12
2	A	15/07/2020 13:02:54		2	A	13/07/2020 12:44:02
3	B	14/07/2020 21:09:16		3	B	14/07/2020 21:17:05
4	C	17/07/2020 02:28:36		4	B	14/07/2020 21:38:44

We want you to build a query that assigns goals to sessions so that we have a *session_id* for every *goal_id*

Notes:
- Every goal must be assigned to 1 session
- 1 session can be assigned to multiple goals
- There could be some sessions without goals

4. Business Case

With this task, we would like to get an idea of how you would approach a strategic challenge as well as a more tactical product analytics problem at Goin.

The task below is meant to assess the skills and knowledge that we think are crucial for this position: strategic thinking, customer behavior analysis, and clarity of presentation. There is no "correct" solution to this test. Use your own judgment and what you know about Goin so far. We primarily want to see how you think, so the more you can back up your ideas with strong arguments, the better.

This file contains "fake" data about users that have completed Goin goals in 2019. The structure of the data is as follows:

- *Column A*: category of the goal
- *Column B*: total amount of goals completed in that category in 2019
- *Column C*: average price of that goal
- *Column D*: total revenue from feature X

Feature X: if the users buy feature X ($5), we allow them to use some premium Goin features that will help them achieve their goals faster

Situation: your assignment is to come up with a data-driven plan to improve the monetization of our platform

Questions
- What can we learn from the available data?
- How would you proceed to better monetize our platform using feature X?
- What additional tests would you perform to strengthen your plan?