Vectolabs is a Smart city and Enterprise IoT solutions company. (https://www.vectolabs.com/) This position will require you to work in a team and individually to develop custom IoT solutions. Our successful software developer candidates have strong fundamentals and understanding of IoT ecosystems and data structure & algorithm.

1. **We are in CoPlace 2, Cyberjaya, Selangor. Although software development work can be done remotely, this job may require to be present at the office from time to time. Please confirm that you can come to the office during normal work hours when required.**

2. **Optional: Please attach your academic transcripts if you already have it handy (non-official printed from University's site is acceptable).**

3. **Please answer the following questions based on the use cases provided below:**

Case 1

You have an IoT application that runs on Cloud, it manages sensors at farm fields and collects information of land moisture and temperature of the environment. The owner has a new idea and created a formula that calculates the farm's nutrition. To do that, you have to be able to pull weather data and generate daily trends of weather in one month and create relation with average moisture & average temperature daily. The relation factor will be on day of week.

Formula = (wheater_today * average_temperature_today) / average_moisture_today.

Whether score :

Rainy = 1, Sunny = 2, Cloudy = 3, Windy = 4, Snowy = 5.

Questions :

1. Design an ERD (Entity Relation Diagram) with proper normalization technique applied that is suitable for the application mentioned above.
2. Explain the calculation with pseudo SQL.

Case 2

John Aviation runs a company that focuses on drone technology. Now , the company decided to develop a device that is able to send data from the ground to the drone. Due to data needing to be sent over long distances , the data need to be as small as possible.

Required data :

Voltage : 254

Energy: 1450

Current : 1580

Please write a function in any programming language that returns data provided in <= 3 bytes (no 3rd-party library allowed) and a function that reads the converted data back in JSON format.

Case 3

Power Motor Industries Sdn Bhd has been acquired by Tesla Motor Inc. Due to acquisition, current practice for calculating hourly employees needs to streamline with Tesla Motor accounting practice. These new rules affect the calculation of overtime for hourly employees.

These new rules require a different rate for each employee based on the year of service and number of overtime hours for the day.

Seniority (year)	multiplier
0 - 1	1
2 - 3	1.1
4 - 5	1.2
> 6	1.7

Overtime (hour)	multiplier
0 - 1	2
2 - 3	2.1
> 4	3

For example, Tajuddin has been an employee for Power Motor since 2019 and he has 2.5 hour of overtime and his hourly rate is RM 20 /per hour.

Number of years = 2

First Hour

(1 * 1.1) * 2 * 20 = 44

Second Hour

(1.5 * 1.1) * 2.1 * 20 = 69.3

Total overtime wages for the day is RM 113.30

Please write a function in any programming language or pseudo-code to determine overtime wages given the number of years of service and overtime hours.

Case 4 (Optional)

Create a simple VueJS application that displays the list of the data below and deploy it in any free hosting platform (preferably free tier AWS or 000webhost) and be able to download the data in CSV format. Please share a url where the page was deployed.

Required data:

Asset name	Department
Printer	HR
Monitor	IT
Barcode Scanner	ACCOUNT