National Australia Bank

in partnership with PYCOGROUP

Backend Assessment

For Experienced NodeJS Engineer

Version: V1

1. Problem Statement

A small start-up named "iCommerce" wants to build an online shopping application to sell their products. In order to get to the market quickly, they just want to build a version with a very limited set of functionalities:

- A single web page application that shows all products on which a customer can filter, sort and search for products based on different criteria such as name, price, branch, colour etc.
- A backend side to serve requests from web application such as show products, filter, sort and search.
- If a customer finds a product that they like, they can only place an order by calling to the company's Call Centre.
- To support sales and marketing, all customers' activities such as searching, filtering and viewing product's details need to be stored in the database.
- No customer registration is required.
- No online payment is required.

2. Guidance

- You're responsible for designing and implementing the backend services, you don't need to build the frontend web application.
- It is expected that this will usually take you about 4-8 hours to complete and will serve as a foundation for a later conversation with you. Actually, there's no limitation regarding how long you should do this assessment, you are free to do the assessment in more than one day as long as you're comfortable with that. Use this assessment as a chance for you to show your expertise and how passionate you are!
- You are encouraged to take this test to show up your expertise about Architectural/OOP or functional programming design patterns, principles and best practices as long as you have the right reason to use it.

- You don't need to build complete backend services for the application, two or three business workflows are enough.
- You are encouraged to demonstrate different styles of inter-service communication, especially if you choose to implement the backend using microservices patterns.
- You are free to use whatever NodeJS libraries and frameworks you are familiar with, but we would recommend that you use open-source libraries.
- You can use either Javascript or Typescript for your solution.
- We expect some level of testing should be implemented.
- You should follow standard javascript/typescript coding and naming convention.
- You should treat this as a real-world application. While we do not expect it to be deployed, it should be able to run locally.

3. Expected outputs

- A high-level solution diagram for the components.
- Entity relationship diagram for the database.
- Example implementation for some business workflows of the backend services.
- A Readme file explains:
    - Brief explanation for the code structure.
    - All the required steps in order to get the applications run on local computer.
    - CURL commands to verify the APIs.
- You should commit your solution to a publicly accessible source control site (eg. Github or GitLab).
- Your submission just needs to be a link to the repository.
- Please complete your working solution within 7 days of receiving this challenge.