Regtransfers

Coding Exercise

Last updated: 12th January 2022

Overview

Objectives

Demonstrate clean, readable, and maintainable code with evidence of a test first approach, decent code coverage and application of SOLID design principles

Time

Spend as long as you would like on this test (we recommend 2+ hours), the more you complete the more we are able to gauge your ability. You are not required to complete all the user stories, you can even pick and choose which ones to do (although there are some that have prerequisites).

Requirements

- .NET 6 SDK: https://dotnet.microsoft.com/en-us/download/dotnet/6.0
- IDE (Visual Studio, or Visual Studio Code)
    - Visual Studio Community (Free): https://visualstudio.microsoft.com/vs/community/
    - Visual Studio Code (Free): https://code.visualstudio.com/
- Docker Desktop (Required for Microservices version):
  https://www.docker.com/products/docker-desktop

Provisions

- https://github.com/Regtransfers/RTCodingExercise-Microservices
- You have been provided with a solution with four projects
    - ASP.NET 6 MVC Project
    - ASP.NET 6 API Project for a Catalogue of Plates
        - DbContext
        - Model for Plates
        - Seed Method to provide sample data
    - xUnit Test Project for each of these (you may change this out to nUnit if you prefer)
    - docker-compose file
    - This project has a MassTransit and RabbitMQ message bus for your utilisation
        - https://masstransit-project.com/
        - MassTransit has been bootstrapped and useful comments added in the Program.cs files.

Requirements

To build a new Registration Number Plate search system!

User Story 1

As the head of commercial operations
I would like to be able to build a list of available plates for sale
So that we can market them to the public

Acceptance Criteria

Given I have a list of plates
Then I would like to be able to output the list showing the Plate, the PurchasePrice and the SalePrice
Given I have a list of plates
When I add a new plate
Then I would like to be able to output the list including the new plate

Given I have a list of plates
When viewing the list, the SalePrice should include 20% markup.

[Advanced]
Given i have 60,000,000 plates (we have only provided a small number of plates for the purpose of this exercise)
When viewing the list
Then i should only see 20 plates on the page, and be able to page through remainder

User Story 2

As the head of marketing
I would like to be able to order the list of plates by price
So that our customers can view plates in their price range

Acceptance Criteria

Given I have a list of plates
I would like to be able to order the list by price
Then have the plates displayed in price order

User Story 3

As the head of marketing
I would like to be able to filter the list of plates by Numbers or Letters
So that our customers can find plates that match their initials / age

Acceptance Criteria

Given I have a list of plates
I would like to be able to type in my age or initials
Then have the plates displayed that contain my filter criteria

[Advanced]
Given I have a list of plates
When entering my name into the filter
Then i expect a list of plates that look like my name
i.e.

Danny	DAI2 NNY	DA12 NNY
G Smith	GSM I7H	GSM 17H
James	JAM 3S	JAM 3S

User Story 4
As the head of commercial operations
I would like to mark plates as reserved
So that we are not selling plates that are reserved

Acceptance Criteria

Given I have a list of plates
When I configure a plate to be reserved
And I search for the plate
Then the plate should have a status of reserved

[Advanced]
Given a plate is reserved/unreserved
Then that information should be logged for audit purposes

User Story 5
As the head of commercial operations
I would like only plates "for sale" to appear in a filtered search
So that we do not confuse customers

Acceptance Criteria

Given I have a list of plates with some that are reserved
When I output the list from search
Then only plates for sale should be shown

User Story 6

As the sales director
I would like to be able to sell a plate
So that we can start making some revenue

Acceptance Criteria

Given I have a list of plates with prices
When a customer buys a plate
Then the plate should be marked as sold

Given I have a list of plates
When I configure a plate to be sold
And I search for the plate
Then the plate should have a status of sold

Given I have a list of plates
When a plate is sold
Then a total revenue label should be incremented at the top of the page

[Advanced]
Given i have a list of plates
When a plate is sold
Assuming the SalePrice is inc VAT and the Purchase Price is exc VAT
Then a label with the average profit margin for all sales should be updated
(if you feel inclined, plot this on a chart)

User Story 7

As the head of marketing
I would like to be able to offer money off promotions
So that we can improve sales

Acceptance Criteria

Given I enter the promo code DISCOUNT
When a customer searches for a plate
Then the price should be offered at a £25 discount

[Advanced]
Given i enter the promo code PERCENTOFF
When a customer searches for a plate
Then the price should be offered at a 15% discount

User Story 8

As the head of marketing
I would like to make sure we do not sell plates under 90% of the sale price
So that we can control discount codes

Acceptance Criteria

Given I have a plate for sale at £200.00
When a customer adds the promo code DISCOUNT
And tries to purchase the plate
Then the customer should be advised the discount code is not applicable

[Advanced]
If you are having fun and would like to continue, feel free to write code and document it so that we can see what and why you have done it. You are in no means expected to do any more