Novibet Interview Assignment

EXPRESSYOURSELF

Introduction

Welcome to Novibet and **ExpressYourself**.

ExpressYourself is the way through which you will express your skills, designs and thoughts on programming.

You are completely free to follow your approach, best practices, code patterns, libraries, or anything else you are familiar with.

We would like to see some abstractions like interfaces and their corresponding concrete classes, design patterns like decorator, factory etc..., maybe some unitests, or anything else you may come up with, so that we will have interesting stuff to discuss during the code review afterwards.

Project

The topic of this assignment is the information regarding IP addresses and we'll use IP2C, which is a free web service, in order to get these details.

Your project will consist of two parts:

1. A REST API written in the latest version of .net core.

   (All interactions with the database must be implemented using EntityFramework except for task 2 which requires raw sql)

2. A SQL database *(schema and seed data can be found at the end of this document however feel free to use any approach you want)*.

Tasks

1. **IP INFORMATION ENDPOINT**

   Our REST Api should expose an endpoint which will return the details of an IP *(CountryName, TwoLetterCode, ThreeLetterCode)* for a specific IP given by the caller.

   At this point we have to think about performance and cost so our application should try to get this information from a cache first, then from the database provided that no data found in cache, and lastly it should make a call to IP2C service in order to fetch the information, persist it in the database (for later usage) and also store it in the cache.

2. **UPDATE IP INFORMATION**

   IPs information may change from time to time, so we need to implement a periodic job (every one hour) which will take all IPs from the database (in batches of 100), calls the IP2C service to fetch the latest information and update the database and invalidate the cache in case of information has been changed for some IPs.

3. REPORT ENDPOINT

Another one endpoint should be exposed by our application which will return a report of how many addresses per country we have in our database and which was the last time an IP of a country was updated. The caller may provide an array of specific TwoLetter country codes that they want this report for, or null to get this report for all countries.

This functionality must retrieve any necessary data from the database using raw sql (any way you want instead of EntityFramework).

API response should be an array containing items of the following contract:

{ CountryName: string, AddressesCount: int, LastAddressUpdated: DateTime }

**Sample image of sql results*

	CountryName	AddressesCount	LastAddressUpdated
1	Greece	4	2022-10-12 08:41:37.3100000
2	Italy	3	2022-10-12 07:04:51.3233333
3	Japan	3	2022-10-12 07:04:51.3233333
4	Spain	3	2022-10-12 07:04:51.3233333
5	United States	3	2022-10-12 07:04:51.3233333
6	China	3	2022-10-12 07:04:51.3233333
7	Cyprus	3	2022-10-12 07:04:51.3233333
8	France	3	2022-10-12 07:04:51.3233333
9	Germany	3	2022-10-12 07:04:51.3233333

At the end, we will be happy to have a discussion with you on the project and the way you decided to implement it. At that time you will need to justify and elaborate on what led you to take these decisions in order to help us have a better understanding of your approach.

Database Schema & Seed Data

```
/****** Object:  Table [dbo].[Countries]    Script Date: 12/10/2022 12:07:23 ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[Countries](
[Id] [int] IDENTITY(1,1) NOT NULL,
[Name] [varchar](50) NOT NULL,
[TwoLetterCode] [char](2) NOT NULL,
[ThreeLetterCode] [char](3) NOT NULL,
[CreatedAt] [datetime2](7) NOT NULL,
 CONSTRAINT [PK_Countries] PRIMARY KEY CLUSTERED
(
[Id] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, FILLFACTOR = 95,
OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
/****** Object:  Table [dbo].[IPAddresses]    Script Date: 12/10/2022 12:07:23 ******/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[IPAddresses](
[Id] [int] IDENTITY(1,1) NOT NULL,
[CountryId] [int] NOT NULL,
[IP] [varchar](15) NOT NULL,
[CreatedAt] [datetime2](7) NOT NULL,
[UpdatedAt] [datetime2](7) NOT NULL,
 CONSTRAINT [PK_IPAddresses] PRIMARY KEY CLUSTERED
(
[Id] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON, FILLFACTOR = 95,
OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
) ON [PRIMARY]
GO
SET IDENTITY_INSERT [dbo].[Countries] ON
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (1,
N'Greece', N'GR', N'GRC', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (2,
N'Germany', N'DE', N'DEU', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (3,
N'Cyprus', N'CY', N'CYP', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (4,
N'United States', N'US', N'USA', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (6,
N'Spain', N'ES', N'ESP', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (7,
N'France', N'FR', N'FRA', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
```

```
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (8,
N'Italy', N'IT', N'IA ', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (9,
N'Japan', N'JP', N'JPN', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
INSERT [dbo].[Countries] ([Id], [Name], [TwoLetterCode], [ThreeLetterCode], [CreatedAt]) VALUES (10,
N'China', N'CN', N'CHN', CAST(N'2022-10-12T06:46:10.5000000' AS DateTime2))
GO
SET IDENTITY_INSERT [dbo].[Countries] OFF
GO
SET IDENTITY_INSERT [dbo].[IPAddresses] ON
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (6, 1,
N'44.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (7, 2,
N'45.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (8, 3,
N'46.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (9, 4,
N'47.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (10, 6,
N'49.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (11, 7,
N'41.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (12, 8,
N'42.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (13, 9,
N'43.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (14, 10,
N'50.255.255.254', CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2),
CAST(N'2022-10-12T07:04:06.8566667' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (15, 1,
N'44.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (16, 2,
N'45.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (17, 3,
N'46.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
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INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (18, 4,
N'47.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (19, 6,
N'49.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (20, 7,
N'41.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (21, 8,
N'42.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (22, 9,
N'43.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (23, 10,
N'50.25.55.254', CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2),
CAST(N'2022-10-12T07:04:33.3800000' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (24, 1,
N'44.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (25, 2,
N'45.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (26, 3,
N'46.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (27, 4,
N'47.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (28, 6,
N'49.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (29, 7,
N'41.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (30, 8,
N'42.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (31, 9,
N'43.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (32, 10,
N'50.25.55.4', CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2),
CAST(N'2022-10-12T07:04:51.3233333' AS DateTime2))
GO
```

```
INSERT [dbo].[IPAddresses] ([Id], [CountryId], [IP], [CreatedAt], [UpdatedAt]) VALUES (33, 1,
N'10.20.30.40', CAST(N'2022-10-12T08:41:37.3100000' AS DateTime2),
CAST(N'2022-10-12T08:41:37.3100000' AS DateTime2))
GO
SET IDENTITY_INSERT [dbo].[IPAddresses] OFF
GO
SET ANSI_PADDING ON
GO
/****** Object:  Index [IX_IPAddresses]    Script Date: 12/10/2022 12:07:23 ******/
ALTER TABLE [dbo].[IPAddresses] ADD  CONSTRAINT [IX_IPAddresses] UNIQUE NONCLUSTERED
(
[IP] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF,
IGNORE_DUP_KEY = OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON,
FILLFACTOR = 95, OPTIMIZE_FOR_SEQUENTIAL_KEY = OFF) ON [PRIMARY]
GO
ALTER TABLE [dbo].[Countries] ADD  CONSTRAINT [DF_Countries_CreatedAt]  DEFAULT (getutcdate())
FOR [CreatedAt]
GO
ALTER TABLE [dbo].[IPAddresses] ADD  CONSTRAINT [DF_IPAddresses_CreatedAt]  DEFAULT
(getutcdate()) FOR [CreatedAt]
GO
ALTER TABLE [dbo].[IPAddresses] ADD  CONSTRAINT [DF_IPAddresses_UpdatedAt]  DEFAULT
(getutcdate()) FOR [UpdatedAt]
GO
ALTER TABLE [dbo].[IPAddresses]  WITH CHECK ADD  CONSTRAINT [FK_IPAddresses_Countries]
FOREIGN KEY([CountryId])
REFERENCES [dbo].[Countries] ([Id])
GO
ALTER TABLE [dbo].[IPAddresses] CHECK CONSTRAINT [FK_IPAddresses_Countries]
GO
```