ECS713U/ECS713P Functional Programming

Group Project – Group 5

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INTRODUCTION:

This report details the setup and functionality of The Haskell programme that retrieves and displays information about when bank holidays are in England and Wales, Scotland and Northern Ireland.

DATA SOURCE:

We are using the data from https://www.api.gov.uk/gds/bank-holidays/#bank-holidays to fetch the data about bank holidays in the UK.

COMPILING AND RUNNING THE APP:

After downloading and extracting the project execute the following commands from the terminal.

- *stack setup*
- *stack build*
- *stack exec haskell-project-exe*

WHAT THIS APP DOES?

This application displays data about the bank holidays for the divisions in the UK (England and Wales, Scotland and Northern Ireland)
We have below options in the app

1. Download Data – Fetches the data from the API and stores it in DB after parsing. Also encodes the parsed data and stores the data in a JSON file.
2. View all Bank Holidays for the current year – Gives the option to choose a division and displays all the bank holidays for the current year.
3. View all Bank Holidays for a given year - Gives the option to choose a division and displays all the bank holidays for a year between 2017 and 2023.
4. Find next Bank holiday – Gives the option to choose a division and displays the upcoming bank holiday in the chosen division.
5. Start local server – Starts a local server using Scotty to fetch holidays using API. (Refer to extra feature section for API documentation)

DATABASE DESIGN JUSTIFICATION:

The data is stored in two tables called "divisions" and "events" in the database. The "divisions" and "events" tables have a One-to-Many relationship. Since many events belong to a division a separate table is used to store the divisions and events to avoid data redundancy.

HADDOCK DOCUMENTATION:

We can generate Haddock documentation for this project by executing the following command in the terminal.
stack exec -- haddock --html app/Main.hs src/Database.hs src/Date.hs src/Fetch.hs src/Parse.hs src/Types.hs src/WebAPI.hs --hyperlinked-source --odir=dist/docs
The Haddock documentation of this project is already generated can be found in the "/dist/docs" directory.

MODULES:

Main.hs - This is the main module, where the initial connection is made, as well as other functions that make the user interact with the app.
Database.hs - This Module establishes database connection and also takes care of creating tables and also inserting and fetching data from the table.
Date.hs – This is an additional module to get the current year and current date to display the next bank holiday and bank holiday of the current year.
Fetch.hs – The Fetch module helps in making the HTTP request to the given URL and returns the response body of the data in Byte String format.
Parse.hs – This module helps in parsing the given data from Byte String format to defined Haskell data type.
Types.hs – This module contains the custom Haskell data type for the events and divisions**.**
WebAPI.hs – This is a simple additional feature using Scotty for making an API request to fetch data.

EXTRA FEATURE :

A simple web API is implemented using the Scotty package for fetching all the bank holidays in a division in a given year. This can be started by running the application and choosing option 5.

URL: localhost:3000/holidays/<year>/<division>
METHOD: GET
PARAMS:
year – A year between 2017 and 2023
division – england-and-wales, scotland, northern-ireland

sample request URL : http://localhost:3000/holidays/2021/england-and-wales
sample output :
[{"date":"2021-01-01","title":"New Year's Day","notes":""},{"date":"2021-04-02","title":"Good Friday","notes":""},{"date":"2021-04-05","title":"Easter Monday","notes":""},{"date":"2021-05-03","title":"Early May bank holiday","notes":""},{"date":"2021-05-31","title":"Spring bank holiday","notes":""},{"date":"2021-08-30","title":"Summer bank holiday","notes":""},{"date":"2021-12-27","title":"Christmas Day","notes":"Substitute day"},{"date":"2021-12-28","title":"Boxing Day","notes":"Substitute day"}]

References :
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