Income Tax Calculator (Front-End Focus)

You are required to produce a solution for a Tax calculator. You may use any notation to represent your design, and code using C#. We are particularly interested in the front-end application implementation. Please use Angular to create your solution and consider the following points and specification:

Backend

- Create a self hosted .NET Core Web API
- Encapsulate salary calculation so that you can easily implement unit tests
- Expose a HTTP Post endpoint for calculate the salary and return results as JSON
- Add the relevant unit-tests to cover the calculation logic mentioned above

Frontend

- Input validators for "Gross Annual Salary" - required, numerical field
- Prevent triggering whilst processing (you can emulate response delay)
- Use Angular Material components and assure that the layout stays responsive to a appropriate degree
- Split in UI into 2 sections
    - One that holds the salary input and Calc button
    - The other for showing up calculation result
- Unit-test that the components behaviour
- Preferable use RxJS

Your design should assume that you are writing an enterprise scale application and should demonstrate your knowledge and understanding of object oriented design, design patterns, testing, scaling and software engineering principles. You should also indicate any third party frameworks or components that you have used in your implementation and its testing.

The solution to this exercise can be submitted via zip file (only containing source code), or via access to an online repository such as GitHub.

Background - Tax calculation

UK Income tax is calculated according to tax bands. Tax within each band is calculated based on the amount of the salary falling within a band. The total tax is the sum of the tax paid within all bands. Each band has an optional upper and mandatory lower limit and a percentage rate of tax. Tax bands will not overlap.

Each band takes its upper limit to be the lower limit of the next band. The tax band covering the upper part of the salary never has an upper limit. The
the uppermost tax band has a tax rate of 40%; this allows tax to be capped.

Sample data:

Tax Band	Annual Salary Range (£)	Tax Rate (%)

Tax Band A	0 - 5000	0
Tax Band B	5000 - 20000	20
Tax Band C	20000 +	40

Both the tax rate and limits are integer values. Tax is calculated based on the gross annual salary. (see "Examples of tax calculations"). Net salary is gross salary less tax. Monthly amounts are the annual amounts divided by 12.

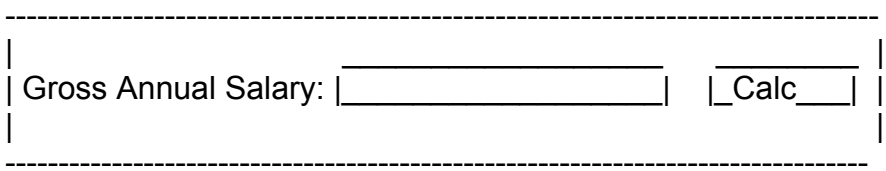
Further notes

- You should build your front-end application using the latest stable version of Angular
- You do not need to implement a database.

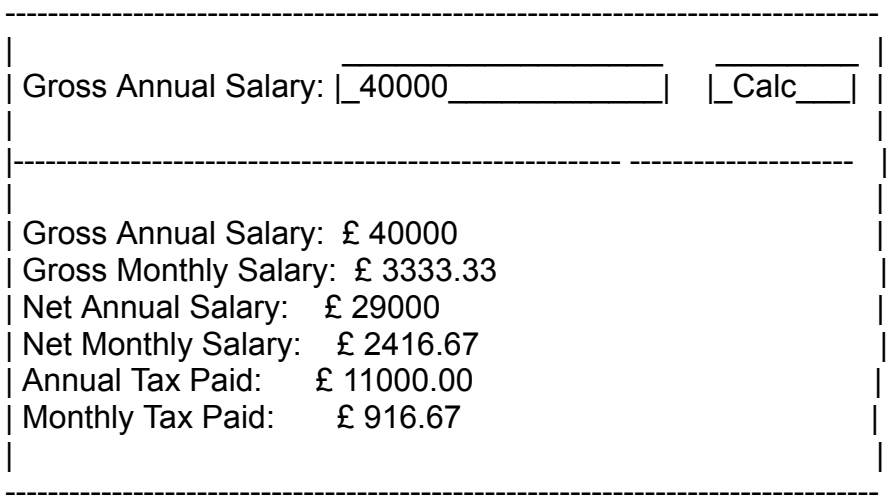
User Interface

The wireframes below indicate the requirements for two simple screens.

Salary entry screen:



Results screen:



Examples of tax calculations

For salary: 10000 p.a.

Salary in Band A = 5000 => Tax paid = 5000 x 0% =   0
Salary in Band B = 5000 => Tax paid = 5000 x 20% = 1000
Salary in Band C =   0 => Tax paid =   0 x 40% =   0

=> Annual tax paid = 1000

For salary: 40000 p.a.

Salary in Band A = 5000 => Tax paid = 5000 x 0% =   0
Salary in Band B = 15000 => Tax paid = 15000 x 20% = 3000
Salary in Band C = 20000 => Tax paid = 20000 x 40% = 8000

=> Annual tax paid = 11000