Backend Coding Challenge

V1.4

Coding Challenge

Main code task:

In the UK, the amount of income tax one has to pay is calculated through a number of tax bands. For the current year, it sits as follows

- 0% on earnings up to £12,500
- 20% on any earnings between £12,501 and £50,000
- 40% on any earnings between £50,001 and £150,000
- 45% on earnings of £150,001 and over

For example, if you earn £52,000 a year, you pay

- 0 on the first £12,500
- 20% on the £37,500 (£12,501 - £50,000) -> £7,500
- 40% on the remaining £2,000 -> £800

In total, you would pay £8,300 income tax.

Please write an AWS Lambda function in C#/.NET that will calculate how much income tax one would pay. It will receive as input, the annual salary; and provide as output, the total income tax payable for the year. If a flag for detailed output is set, then the lambda function will return, in addition to the total income tax payable, the tax payable at each band.

The tax bands should be loaded from an external source, such as an http URL, a cloud storage bucket, or any kind of database, such as SQLite, MySQL, Redis, MongoDB, etc.

To try out and test your Lambda function you can either use your own free-tier AWS account, set up a free-tier AWS account or you can use one of several ways to run lambda functions locally, such as for example:

- docker-lambda
- AWS's .NET Mock Lambda Test Tool
- AWS SAM (using sam local invoke)
- Localstack

For the external source for the tax bands, you can use a docker image, a local database, a local http server or alike.

Please create a public repo on GitHub with the task completed, and share a link to it. We will want to run your Lambda function so please include instructions on how to do so depending on how you tried to run it, eg the docker-lambda, the AWS cli, etc.. and provide instruction how to setup external dependencies such as the source for the tax band data.

Additional Guidance:

If you need a little more help on running lambda functions: an easy way to run lambda functions locally is to use the AWSToolkit with Visual Studio Code (through the Visual Studio Marketplace) or with Jetbrains Rider (through the plugins marketplace/repo). You will also need to install AWS's SAM tool, which provides a local execution environment: Installing the AWS SAM CLI - AWS Serverless Application Model (amazon.com)