Demo Project

The below outlines a project we would like for you to undertake for us to further evaluate your technical skills. The project guidelines are below.

Please do not spend more than 16 hours on this project

You are free to use whatever libraries, packages, open-source tools, or other developer productivity aids you find helpful. If you use any, please let us know, because we're always looking for ways for us to improve our own productivity, too.

Web API

The backend should be a web API endpoint, something that a web or mobile client could use over HTTP to obtain data from the server. It should accept JSON as input, and likewise return JSON as output. The actual format of the JSON is entirely up to you, but we would like you to use current conventions and RESTful principles as your guide in the design.

This should be written in C#. You may use frameworks and libraries (Entity Framework, 3rd party libraries, etc.) so long as they are either included in the project or pulled in as part of a build process (i.e., nuget).

The web API should verify that the data in the incoming request is acceptable input, but you may assume (for practical purposes) that the incoming data is always well-formed.

Any errors should be communicated using traditional web API (RESTful) error-reporting mechanisms.

Front End

The front end of your project can be whichever framework you choose (i.e. AngularJS, React, Vue, RAZOR, etc.)

The Project: Trip Calculator

The project goals are simple: We require a program that calculates the expenses for a group of students who like to go on road trips.

The group agrees in advance to share expenses equally, but it is not practical to share every expense as it occurs. Thus, individuals in the group pay for things, such as meals, hotels, taxi rides, and plane tickets. After the trip, each student's expenses are tallied and money is exchanged so that the net cost to each is the same, to within one cent. In the past, this money exchange has been tedious and time consuming. Your job is to compute, from a list of students and their personal expenses from the trip, the minimum amount of money that must change hands to equalize (within one cent) all the students' costs.

So, for example, Louis, Carter, and David took a trip together; Louis incurred expenses of $5.75, $35.00, and $12.79, Carter paid out $12.00, $15.00, and $23.23, and David covered $10.00, $20.00, $38.41, and $45.00. Louis' total was $53.54, Carter's was $50.23, and David shelled out $113.41. The total cost of the trip was thus $217.18, and thus equal shares would be $72.39 1/3 cents. Therefore, Louis owes David $18.85, and Carter owes David $22.16.

The output should include each student's name, and how much each student needs to pay out to any others. For simplicity's sake, it is safe to assume three students, two of which pay much less than the third; however, if you want to make it a general-purpose solver to work with any number of students, please feel free.

Final Notes

Your code should include all the necessary steps (either automated as part of the build process, or in shell scripts that we can run, or else documented very clearly on how to deploy the app) such that we can run the code with a minimum of work.

Please include a README with your submission that indicates any special instructions for running your code (Such as a NuGet package restore) and include what selections you made for the backend and frontend.

Please publish your code to a public-accessible repository such as GitHub.

We look forward to hearing from you, evaluating your code, and working with you further!