Scaling up an interactive web app of insights into the data of a digital charity

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Lead Supervisor: Clement Lee

Department: (School of) Mathematics, Statistics and Statistics

Email address: clement.lee@newcastle.ac.uk

Description:

Freegle is a digital charity that promotes reuse and reducing landfill. It operates an exchange platform where users give away household items to other users, with no financial transactions involved. A user (offerer) posts an item and others (repliers) ask to be considered, with one replier chosen and collecting the item, thus completing the exchange.

A prototype of a Shiny app of the exchange data has been developed. The focus of the app is to visualise the **relevant neighbourhood**, which represents the distance an average user at a certain geolocation travels for items. This concept of relevant neighbourhood is beneficial to the operations of Freegle. However, numerous improvements are to be made:

1. While the results with a higher spatial resolution are available, they have to be incorporated into the Shiny app. The higher computational requirements mean it cannot be directly hosted on a free platform.
2. The idea of isochrone, which is a neighbourhood that a user can get to within a certain time rather than distance, is desired to be incorporated. While creating the circle of a certain radius is straightforward and geolocation independent, creating an isochrone of a certain travelling time is much more computationally intensive, as it requires obtaining data from a maps API on the web, before carrying out the calculations for the relevant neighbourhood, and this has to be done **for each geolocation involved**. This is the part that can most benefit from HPC compute resources.
3. Many intermediate files have been created in the process of building the Shiny app. A reproducible workflow and the subsequent documentation are required so that this can be rebuilt on another machine.
4. Ultimately, it would be useful to host this directly on Freegle's server. To implement the improvements above, the app has to be dockerised.

The anticipated deliverable is a dockerised app that can potentially be deployed on the main system of Freegle.