THE FLETCHER SCHOOL
TUFTS UNIVERSITY

Digital Planet
Where Digital Innovation Meets the World

Candidate Assessment

Assistant Researcher, Digital Economy Insight Community - The Fletcher School (21001703)

Thank you for applying to work with Digital Planet at the Institute for Business in the Global Context, at the Fletcher School. Digital Planet is an interdisciplinary research initiative of The Fletcher School's Institute for Business in the Global Context. Dedicated to understanding the impact of digital innovation on the world, Digital Planet provides actionable insights for policymakers, businesses, investors, and innovators.

As part of our selection process, we ask all candidates to complete this two-part assignment.

Part I

Imputation - calculating missing data

We often encounter missing data in our work when data may not be available for specific years and/or specific countries. To better understand how you approach quantitative work and imputations, please complete the following:

1. Digital financial payments are becoming the norm around the world. In the attached excel workbook *Digital Planet_Candidate Assessment Part I.xlsx*, in the tab "Made Digital Payments", impute the missing years data.
2. Trust is important in the digital world. In the same excel workbook, in the tab "Trust in Tech Industry" impute (create estimates for) the missing country values. Make sure to note your assumptions and methods for each imputation. You should share these in your final product, or as an attached document to your final product.

Visualization

With the datasets, including your imputed data, create a visualization to communicate this data to a wide audience. You may use any tool to create this visualization, supplement it with any additional data (make sure to cite your sources), and prepare it for distribution in a Powerpoint, pdf, or a webpage. Think about what kind of story/conclusions we can draw from your visualization.

What can we learn from these data sets?

In your final Powerpoint, pdf, or webpage, include a brief analysis of the data. What observations do you note? Are there any relationships between data? What might be relevant for a business or government, and what recommendations would you have? Are there limitations in your approach, and are there areas which are worth further exploration?

Part II

Amidst all of the turmoil of 2020 triggered by the SARS-CoV-2 coronavirus, one trend emerged clearly: digitalization helped people work, learn, shop, and socialize safely during a pandemic and hold on to some semblance of normalcy. However, the access to quality internet is uneven across the globe, even among one of the most advanced countries in the world—the United States (US). There are about 42 million Americans lack access to terrestrial broadband internet, per BroadbandNow's most recent study.

The Digital divide is not only a rural issue in the US. To better understand your comfort working with data and attention to details, please complete the following:

1. In the attached excel workbook *County_Rural_Lookup_Candidate Assessment Part II.xlsx*, you can find the percentage of the county population living in rural areas as of the US 2010 Census. Using the definition provided by the excel workbook on "urban," "mostly rural," and "completely rural;" and the most recent data Microsoft (MSFT) published on US broadband usage percentages dataset by county on Github: https://github.com/microsoft/USBroadbandUsagePercentages
    a) Calculate the weighted average for "urban," "mostly rural," and "completely rural" counties for each state, using both MSFT broadband usage and Federal Communications Commission (FCC) broadband availability data. Organize your result by state. Make sure to note your assumptions, methods, or codes. You should share these in your final product or as an attached document to your final product. According to the Microsoft data, what is the rate of broadband usage in each state, and at the urban, mostly rural, and completely rural level? According to the FCC data, what is the rate of broadband availability in each state, and at the urban, mostly rural, and rural level?
    b) Any inconsistencies you noticed in the data sets when aggregating them to the state level? Anything you'd like to flag for us? Please include your comments in your final Powerpoint, pdf, or webpage.