CS397/497, Winter 2023
Homework: Cellular

This is an **individual** assignment. Submission is through Gradescope. You should submit a PDF with two reports, as described below.

The purpose of this assignment is to gain some understanding of how connectivity differs around the world. We are going to crowdsource information on cellular data plans from different countries. The goal is to get a diverse sampling of what communication options are available, through the lens of an IoT developer.

This is going to be interesting. It's definitely going to require some web searches and a little bit of reading between-the-lines in some cases. I clearly don't have exact answers here, so the goal is really for you to engage with the goals, do a reasonable investigation, and demonstrate that you've done so.

Understanding Global Cellular Costs

Pick two different countries from <u>two different continents</u>.

- **Please choose a different country + carrier from anyone else in class** (two people can do the same country, if they choose different wireless carriers). <u>Claim carriers here.</u>

Imagine you are an IoT application developer looking to deploy in this country. Your task is to figure out (a) whether this is feasible, (b) what management tasks you will have to undertake, and (c) how much it will cost.

Concretely, imagine you are setting up a 6-month pilot with 1,000 devices. For uplink, each device will send a 1 kB request once every 10 minutes, 24 hours a day. For downlink, let us also assume that once per month, you will update device firmware (a 10 MB operation; done 6 times total).

Your devices preferentially support 2G, LTE-M, and NB-IoT networks. In an emergency you could support 3G/4G (if it's the only option for that country/carrier).

Q1: Record Results [20pts]

A summary of your results should be included on the Cellular Costs spreadsheet: https://docs.google.com/spreadsheets/d/1bwZrQNz40s4S84LPGbv1N6qtDhMmnCPwPjYKYnAhaAw/edit?usp=sharing

Please choose a different country + carrier from anyone else in class (two people can do the same country if they choose different wireless carriers). You should also reserve your "Country + Carrier" combination on that spreadsheet and validate that your choice is unique. You can fill in the data later after you figured it out.

Q2: Country 1 [40pts]

For your report for each country, imagine you were writing up a summary to present to your project manager / engineering team on the feasibility and cost to deploy your pilot in this country. Keep the report to two pages maximum please.

Some things to include:

- What is the process (roughly) to get 1,000 SIM cards?
  - What is the activation / per-SIM initial / other one-off startup cost (if any)?

- What is the cheapest way to provide the needed connectivity for your fleet for this pilot?
  - Pre-paid / post-paid? How will you keep devices online?

- What quality-of-service guarantees are available (if any)? [Note: `none` may be likely!]
  - Include things such as advertised speed/performance [even if not SLA contract promise]

- Citations, links, and potentially screenshots to validate your results.

Q3: Country 2 [40pts]

Must be a separate continent from the previous question, but otherwise same idea as before.