ACSE-5: Advanced Programming
Assignment One

Implement a numerical model to predict global temperature increase by January 2020, 2030 and 2050 for a specific city. Incorporate any variables you may like into your model (current data, CO_2 emissions, solar storms, whatever you like!). Do use methods that you have learned as part of this or previous courses. Please consider at least 50 data points in your analysis. Be as elaborate as possible, while remaining succinct. The sky is the limit.

Make sure to also incorporate programming techniques that you learned in class. Namely std::cin, cout, string, vector, map, ifstream, ofstream, and others. Feel free to use techniques that are more advanced than those covered in class (!). Document your code (explain in the code what the different blocks of code are supposed to do). Do not copy code from the internet or other sources.

Use any data you can find on the internet, but make sure to reference your sources, and always pick high-quality sources (journal papers, government websites, international agencies, etc). Publicly available datasets include, for example, UK data @ https://www.metoffice.gov.uk/public/weather/climate-historic/#?tab=climateHistoric; and Australian data @ http://www.bom.gov.au/climate/data/. Many countries have this type of data published in the internet.

Your code will be compiled and executed as part of your evaluation. We will mark the projects based on: code structure and style (30/100), numerical methods implemented and quality of prediction (30/100), user experience, creativity and execution (20/100), code documentation (10/100), and one-page description (10/100). To submit, follow these steps:

Step 1>> Select a city for your team (this must be unique). An updated list of registered cities will be posted in the course's GitHub @ https://github.com/msc-acse/ACSE-5 as groups are registered. If one or more teams select the same city, the city will be assigned to the first team to register, and you will receive an email requesting you to change the name of your group. Make sure there is data available for the city you choose!

Step 2>> Register your team (of one or two) in the GitHub classroom @ https://classroom.github.com/g/vIoBBkJd

Step 3>> Gather the data you will be using for your analysis.

Step 4>> Define your approach to predict temperature increase, design your code, and implement your solution. Your code should cover loading, processing, and outputting data for your city.

Step 5>> Upload your code onto your GitHub classroom repository before **midnight of January 27th 2019**. This should include: one C++ MSVC 2017 project file, one main.cpp file, any data files with input information for execution, and any other additional header or source files you create. Make sure to upload all files required for your project to be compiled and executed.

Step 6>> Prepare a one-page description of your code (Word or PDF, single space 11pt). Provide a short explanation of the design of your code, its structure, input/output, and how to execute it. Briefly describe the strengths and/or weaknesses of your chosen design of methods and code structure. Make sure to include your team's city and programming team names in the document.

If you have additional questions email: apaluszn@imperial.ac.uk
Note: This document was modified! We have added 10/100 for the one-page description, for a total of 100/100.