# Module Project Template

Every group submits one project proposal. The recommended length is 1000-1500 words (including the template).

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| **Group number and group members:**  Group 3: Adheesha Kumarasinghe, Elise Vong, Anne Bai, Jeremy O’Connor |
| **Group advisor:**  Jay DesLauriers |
| **Title:**  Analysing London’s pollution and the effect it has on the respiratory diseases. |
| **Research question:**  Investigating the possible correlation between air pollution in London and deaths from COVID-19. |
| **Background:**  Long-term exposure to air pollution could potentially lead to a decline in lung health, which in turn could impact mortality from COVID-19. |
| **Interdisciplinary aspects of the project:**  This project centres on analytical epidemiology, which draws together thinking from the medical and statistical fields to analyse relationships between outcomes and exposures. |
| **Breakdown to individual steps:**   1. Investigate what pollutions toxins we are exposed to and which respiratory diseases these toxins directly correlate to. 2. Investigate the ‘safe’ level that we can be exposed to of these toxins and the health impacts of long-term overexposure to these toxins. 3. Quantitatively estimate how long a person in London spends exposed to these quantities and 4. Quantitatively investigate the concentrations of each of these particles in the air in London boroughs and locations across London. 5. Analyse which areas are at risk of overexposure. 6. Analyse the covid cases for this region. |
| **Define the project core (aka the minimum viable product):**  -Is there a correlation between %deaths from COVID-19 and nitrogen dioxide levels in UK cities. |
| **Define the project extensions:**  We will relate to how pollution from tube stations in London boroughs could be a source of pollution and how this may affect the numbers of numbers of deaths/cases of Covid-19/asthma |
| **Software tools needed for the projects:**  We plan to use Python to run the data analysis and find correlations. This means that some packages in python are needed for this progress. For example, matplotlib.pyplot is needed for plotting the graphs, curve\_fit in scipy is used to fit the data to a mathematical function. |
| **Datasets that will be used in the project:**  *Datasets on Covid-19:*  <https://data.london.gov.uk/dataset/coronavirus--covid-19--cases>  <https://data.london.gov.uk/dataset/covid-19-deaths-mapping-tool>  <https://data.london.gov.uk/dataset/researching-community-collecting-during-covid-19>  *Dataset on pollution:*  Data which can be chosen for specific gases and/or land-points in boroughs  https://www.londonair.org.uk/london/asp/datadownload.asp  In 2019 TFL took measurements on 1000s of filters across their networks, from on trains to platforms to the ticket halls.  [FOI request detail - Transport for London (tfl.gov.uk)](https://tfl.gov.uk/corporate/transparency/freedom-of-information/foi-request-detail?referenceId=FOI-2525-1920)  Pollution from 1000s of locations across London including schools and roads are available in raw spreadsheets from the Mayor of London’s Office.  [Dataset Search - London Datastore](https://data.london.gov.uk/dataset)  Data on tube passengers’ journeys, daily entry/exit numbers, and TfL services are available in raw spreadsheets from Transport for London’s public database.  [Underground services performance - Transport for London (tfl.gov.uk)](https://tfl.gov.uk/corporate/publications-and-reports/underground-services-performance)  National Air Quality reports (for possible comparison) are available from The Department of environment, Food and Rural Affairs.  [Local Air Quality Management (LAQM) Support Website | DEFRA](https://laqm.defra.gov.uk/) |
| **Required hardware:**  We only require laptop at the moment, for running python code on Spyder and for communicating via Github Desktop. It would be possible that we will need the school desktops in the future due to the large amount of data that is required to analyse. |
| **Agreed contributions from each group member:**  Adheesha: writing on potential links between pollution and respiratory disease pathogenesis based on the latest available research, searching for datasets, presentation  Elise: writing on potential links between pollution and respiratory disease pathogenesis based on the latest available research, searching for datasets, presentation  Jeremy: programming, GitHub repository, presentation  Anne: programming, GitHub repository, presentation |
| **Agreed knowledge sharing:**  Jeremy: I would like to learn more about the direct respiratory illnesses caused from the pollutants that the general public are exposed to in their lifestyles in London. I would like to investigate if the current ‘safe’ limits for pollutants is being exceeded and if so, by how much and what are the long term health implications of this, and does it increase their likeliness to get covid-19.  Adheesha: would like to learn how python could be used in data analysis, beyond the scope of the “introduction to python” course.  Elise: would like to know how to use python to create a graph displaying the correlation between pollution and deaths by Covid-19  Anne: would like to learn more about respiratory diseases and see how python can be used to resolve real-life problems. |
| **Agreed timeline:** |
| **Agreed frequency and mode of communication:**  For every week, two meetings would be held at minimum. One would be during the class session; the other would be on Wednesday 2pm. Both meetings would be done in-person. However, if some group members cannot come due to some other arrangements, they can pop in online for discussion. |
| **Project repository:**  All Project coding contributions will be made available to all members on the open share GitHub platform. The hyperlink is available below.  <https://github.com/AnneBai0802/London-Underground-and-Respiratory-diseases> |
| **References/websites/AOB:**  (sources, websites or anything else you would like to mention) |