1. (1%) Present your overall topic and its importance.

2. (2%) Describe how you will define what environmental aspect you are modeling.

3. (2%) Describe your research question, its significance, and its associated hypothesis.

4. (5%) Propose how you may construct or model the studied environment.

Indicate 2-3 variables you’ll need to calculate, what sources of data you will use

for each, and what operations you may need to do to get there. Include a

working conceptual diagram or flowchart, such as using the Lucidchart

(<https://lucid.app>).

5. (5%) Propose how you may explore and present the environmental features

modeled. For example, will you generate a summary statistics table and series of

choropleth maps? Will you generate a scatter plot to show the relationship between

any of the variables? Will you generate a LISA (local autocorrelation) map to

illustrate the clustering pattern of the studied variable? Following item 4, extend

the working conceptual diagram or roadmap to show your proposed methods.

Draft Proposal on Air Quality Analysis in Jakarta

Overall Topic and Importance:

The research focuses on analyzing air quality in Jakarta, one of the most polluted cities globally.

Importance due to rising temperatures, high pollution, and related health issues like respiratory diseases and high cancer rates among residents and smokers.

Personal motivation stemming from noticeable air quality differences when traveling from Bandung to Jakarta.

Environmental Aspect Definition:

The study will focus on the physical/natural environment, specifically air pollution measured by particulate matter concentrations (PM2.5 and PM10).

The impact of these pollutants on public health, specifically respiratory diseases, will be a secondary but crucial aspect of the natural environment.

Research Question and Hypothesis:

Research Question: What is the correlation between particulate matter concentrations (PM2.5 and PM10) and the incidence of respiratory diseases in Jakarta?

Hypothesis: Higher levels of PM2.5 and PM10 are associated with an increased incidence of respiratory diseases among the population of Jakarta.

Constructing and Modeling the Environment:

Calculation of average particulate matter concentration across neighborhoods.

Estimation of respiratory disease incidence rates from health department records.

Determination of distance to major roads using GIS software to assess traffic-related pollution.

Data Sources: Air quality dataset provided, public health records, and city traffic layouts.

Operations: Data wrangling to clean and aggregate air quality data; GIS operations for spatial analysis.

Exploring and Presenting Environmental Features:

Creation of summary statistics for air quality and health variables.

Development of choropleth maps for spatial distribution of particulate matter and health incidences.

Generation of scatter plots to examine the relationship between air pollution and health outcomes.

Conducting LISA analysis to identify spatial autocorrelation patterns.

Diagram/Flowchart: A Lucidchart conceptual diagram will be included to outline the analytical workflow.