**Title**

# Abstract (100~150 words / A paragraph)

Should have

* **Context**: Can you put your research in perspective by providing contextual/background info. Why this research is important?
* **Need/Gap:** What we already know about the issue/what researchers have already looked into. What is missing (which is essentially the gap)? Do we have a gap?
* **Task:** How we are going to address the gap through this work, or in simple terms what is the task that we are going to perform.
* **Object of the Document:** This paper presents…..
* **Findings:** What are some of the key findings from your work.
* **Conclusion:** What do you conclude from your findings
* **Perspectives:** Suggestions for future studies

# Introduction (300~500 words / 3 to 4 paragraphs)

Introduction is expanding the abstract. However, it should not contain the findings, conclusion, or perspectives (because that is reserved for results and discussions). So introduction should have

* **Context:** Here you will expand background information (“stand on the shoulder of giants”). Provide a context to your research by referring to work that has been published previously. A word of caution (only cite literature that is relevant to your research. Do not copy paste!!!).
* **Need/Gap:** Again expand on the gap through relevant citations. If there are articles that clearly mentions that this research should be pursued in the future, cite them. If there are no articles that deals with the particular research question you are interested in (highly unlikely), you could mention that too (for example some of the problems might not be addressed spatially, which makes them novel enough for research).
* **Task:** What have you done in this work to address the gap (may be you have used exploratory methods to lookup the spatial patterns).
* **Object of the document:** What this paper will describe about.

# Data and Preprocessing (500 words / 3 to 4 paragraphs)

Talk about data, especially about why you would want to use this dataset (how it is related to your research). Mention all the facets of data including its availability, whether open source or private….any confidentiality associated with data. Are there any other better datasets available (if so why is it difficult to get such datasets). Did you face any challenges in getting data.

Talk about pre-processing. In what format the data is available (csv, shapefile, json etc) and how are you cleaning up the data.

If you are using scripts to clean up the data include them here. Also you can show snippets of your data through pandas or geopandas.

So this section will be a mix of textual content and code (basically for preparing data).

If you want you can also talk about the distribution of data (basic stats) here.

# Methods (500 words / 3 to 4 paragraphs)

**Methods**

Elaborate on the various methods used (especially the spatial methods). For example if you have used a containment or intersection or spatial join mention about it. Elaborate on why you used the method vs any other method (have you tried multiple method. Do you have a justification for the method that you have used).

Your method section should contain code and should be replicable. It does not matter if you are reading very large files, but the code section should run and provide a valid output.

If needed you can have diagrams for the method so that people who does not have any spatial background can understand your method (you can easily hyperlink external images to notebook).

# Results and Discussions (1000~1500 words / 7 to 8 paragraphs)

While results and discussions could be separate, it is always best to have them together so that you can directly talk about the implications of the results with in this section itself.

This section should contain text (the content), visualization (graphs , maps) that needs to be generated using code, and the corresponding code. Every visualization or theoretical analysis should follow up with a discussion. The discussion should include why the particular result (derived from the visualization or analysis) is important and how you can tie it up to the bigger picture (your goal). You can also compare and contrast your research results with similar research performed by other scientists.

So in simple terms, results and the corresponding discussions are all about how you can connect your findings to the bigger picture.

You can also talk about limitations of your study, limitations of data (and how it can be improved) and your future research plan in this section.

# Conclusion (50 to 100 words 1 paragraph)

In this section state the most important outcome of your work. State briefly what you have done and what could be interpreted from the results. What are the benefits of your results and what could be anticipated in the future based on your results.

# References (Any format you like)

**Notes**

The paper should be in a notebook format (jupyter notebook). Use cells to divide the paragraph and image folder to add external images. Include code with comments so that the entire process is reproducible. We do believe in reproducible science and this is a great opportunity to showcase that.

You can look up <https://notebook.community/tschinz/iPython_Workspace/00_Admin/CheatSheet/Markdown%20CheatSheet>

For effectively using markup language in your paper (for example headers, tables, images etc)