A draft for a college project is an initial version of your project where you outline or present the core components and ideas, typically with less detail or polish than the final version. It serves as a blueprint for what the final project will look like, allowing for feedback, revisions, and refinements.

**Key Components of a College Project Draft:**

1. **Title and Objective**: Clearly state the project title and its main goal or purpose.
2. **Introduction**: Provide background information and context about the topic.
3. **Scope and Plan**: Define what the project will cover and any limitations.
4. **Methodology**: Outline the steps, tools, or methods you will use to complete the project.
5. **Preliminary Results**: If applicable, include any early findings, data, or insights.
6. **Challenges and Questions**: Highlight any areas where you’re uncertain or need feedback.
7. **References**: List sources you’ve consulted so far.

A draft is typically less polished and may not include all the final details, but it should be organized enough to give a clear idea of your project's direction and invite constructive criticism.

**Example Project Draft for a Data Science Class**

**Project Title:**

**"Analyzing the Impact of Rising Sea Levels on Coastal Populations"**

**Objective:**

This project aims to analyze the relationship between rising sea levels due to climate change and the vulnerability of coastal populations worldwide. The goal is to identify the most at-risk regions and populations using historical data and predictive modeling.

**Introduction:**

Sea level rise is one of the critical consequences of climate change, driven by factors like melting glaciers and thermal expansion of seawater. Coastal regions are particularly vulnerable, as flooding and erosion can displace populations and damage ecosystems. Understanding the patterns of sea level rise and its effects on coastal populations can help inform policy decisions and mitigation efforts.

**Scope and Plan:**

1. **Data Collection**:
   * Historical sea level data (1980–2023).
   * Population data for coastal cities.
   * Climate projections for sea level rise.
2. **Data Analysis**:
   * Visualize historical trends in sea level changes.
   * Analyze population density in high-risk areas.
   * Predict future impacts based on current trends.
3. **Outputs**:
   * Heatmaps of vulnerable regions.
   * A predictive model showing population displacement risks.
   * Recommendations for policymakers.

**Methodology:**

1. **Data Sources**:
   * NOAA (National Oceanic and Atmospheric Administration) for sea level data.
   * UN or World Bank for population statistics.
   * IPCC reports for climate projections.
2. **Tools**:
   * Python (Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn).
   * Geospatial libraries (e.g., GeoPandas, Folium).
3. **Steps**:
   * Clean and preprocess the datasets.
   * Perform exploratory data analysis (EDA).
   * Create visualizations (line charts, bar plots, heatmaps).
   * Build and validate a regression model to predict future sea levels.

**Preliminary Results:**

* Coastal populations in Southeast Asia and small island nations are the most vulnerable based on early analysis.
* A significant correlation between urban population growth and coastal vulnerability has been observed.

**Challenges and Questions:**

1. How to address gaps or inconsistencies in historical sea level data?
2. What is the best way to account for local adaptation efforts (e.g., seawalls, flood defenses) in predictions?
3. Are there ethical concerns in presenting "at-risk" regions, and how can these be mitigated?

**References:**

* NOAA's "Sea Level Trends" dataset.
* IPCC Climate Change Reports.
* UN World Population Prospects.

This draft outlines the idea, plan, and potential challenges of the project. As you refine it, you would add more detailed analyses, visuals, and a fully fleshed-out discussion in the final report.

**Example Project Draft for a Data Science Class**

**Project Title:**

**"Analyzing Air Quality Trends in Major Cities Over the Last Two Decades"**

**Objective:**

This project seeks to examine air quality trends in major cities around the world from 2000 to 2023. The goal is to identify patterns, assess the impact of urbanization, and determine correlations between air quality and environmental policies.

**Introduction:**

Air pollution is a critical issue affecting public health and contributing to climate change. With urban areas growing rapidly, monitoring and understanding air quality trends has become increasingly important. By analyzing air quality data over time, this project aims to identify cities with improving or deteriorating air quality and explore factors influencing these changes.

**Scope and Plan:**

1. **Data Collection**:
   * Daily air quality index (AQI) data for major cities.
   * Urban population data.
   * Records of environmental policy implementation dates.
2. **Data Analysis**:
   * Trend analysis of AQI for each city.
   * Comparison of air quality before and after major environmental policies.
   * Explore the relationship between urbanization and air quality.
3. **Outputs**:
   * Time series plots of AQI for selected cities.
   * A model to predict AQI based on urbanization metrics.
   * Policy recommendations for improving air quality.

**Methodology:**

1. **Data Sources**:
   * World Air Quality Index Project database.
   * UN urbanization data.
   * Government reports on environmental regulations.
2. **Tools**:
   * Python (Pandas, Matplotlib, Seaborn, Statsmodels).
   * Time series analysis libraries (e.g., ARIMA, Prophet).
   * GIS tools for mapping urban sprawl.
3. **Steps**:
   * Collect and clean AQI data for 2000–2023.
   * Perform exploratory data analysis (EDA) to detect outliers or gaps.
   * Conduct time series analysis to study trends and seasonality.
   * Use regression models to examine the impact of urbanization and policies on air quality.

**Preliminary Results:**

* Initial analysis shows significant seasonal variations in AQI in cities like Delhi, Beijing, and Los Angeles.
* Cities that implemented strict emissions policies, such as London and Tokyo, show a declining AQI trend.

**Challenges and Questions:**

1. How to handle missing AQI data in less-developed regions?
2. What external factors, such as natural events (e.g., wildfires), should be accounted for in the analysis?
3. How to ensure the predictive model is generalizable across diverse urban environments?

**References:**

* World Air Quality Index Project database.
* UN Habitat urbanization statistics.
* Reports from the Clean Air Initiative.

This project draft lays out a comprehensive plan to study air quality trends and provides a strong basis for further refinement in the final project.

Climate change prior knowledge:

Based on my personal experience or what I heard from media, climate change is about global warming which means average annual temperature of Earth is getting higher over years. I think the main reason for this is pollution humans produce. We have been observing global warming in the last few centuries due to technological advances and consumption of natural resources.

Quiz:

x-axis: years,  y-axis (Left): average global temperature in F,  y-axis (Right): Atmospheric CO2 in ppm.

Red line represents the temperature and the blue line represents the CO2 concetration.

We observe that the average global temperature has been increasing for about a century and CO2 concentration has been inceasing for about 1.5 centuries. CO2 concentration has been increasing steadily however annual temperature average  changes as ups and downs but increases as a general trend.

It apears that there is a relationship between average global temperature and atmospheric CO2 concentration. General trend for both is increasing over years.

CO2 concentration first exceeded 300 ppm in about 1910. This is significant because it stayed between 180 ppm - 300 ppm for hundreds of thousands of years until that year.

**Question 14**

**Not yet graded / 1 pts**

Vital Signs Tab: Look at the "Direct measurements: 2005-present graph" and describe **TWO things** that you notice about the data.

Your Answer:

I noticed that there are two measurements every year June and October. October reading is lower than the June reading always. It is about the same amount lower in October than the June reading. Overall trend is steadily incresing over years.

**Question 15**

**Not yet graded / 1 pts**

Vital Signs Tab: Look at the "Proxy (indirect) measurements graph" and describe **TWO things** that you notice about the data.

Your Answer:

Until 1958 scientists used iced core to collect data, after that year they used modern technology for the measurements. 1911 is the first year that CO2 level passed 300 ppm.

**Question 16**

**Not yet graded / 1 pts**

Vital Signs Tab: Play the "Time Series: 2002-2016 Map" showing world wide CO2 levels and describe **TWO things** that you notice about the data.

Your Answer:

The map was greenish color in the year 2002 with CO2 level 365, as years progressed towards 2022 the map turned into red and CO2 level reached 435.

**Question 17**

**Not yet graded / 1 pts**

Describe TWO things you could do in your life that would reduce the amount of CO2 that you produce (ie: reduce your "carbon footprint")

Your Answer:

Limit travels with my car, use as needed only. Walk short distances. Do not waste anything (water, electricity, gas, food, plastic, cloth).