Project Presentation

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Introduction and Analysis to the Problem

- The report aims to analyze the relationship between the HDI index, food prices, and population in chosen third-world countries and develop a predictive model that accurately estimates the HDI value using these variables.

- The research project investigates the impact of food prices, population, country, and year on HDI values across Africa, the Middle East, and Asia.

- Representative countries including Egypt, Algeria, Central African Republic, Syria, Turkey, Iraq, Indonesia, Nepal, and India are included in the analysis.

- Techniques such as Spearman's correlation matrix, K-Fold validation, linear regression, polynomial regression, decision tree regression, and random forest regression will be utilized in the analysis.

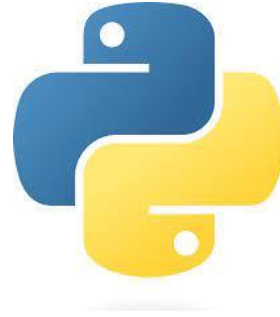# High Level Description of the Code

Pros:
- Taught in class.
- Lots of available resources on canvas.
- Easy import and edit data.

Cons:
- Interface can be confusing sometimes
- Not as widely use as python.
- Less resources on the internet.
- Documentation of how to use this software is limited to its official website, and some other limited sources.
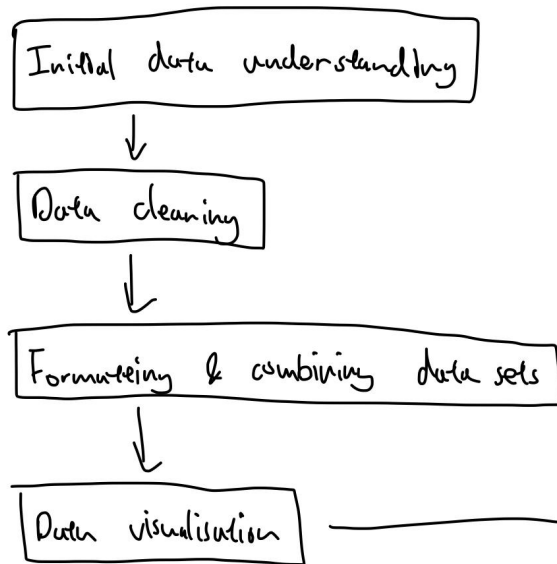
Pros:
- Widespread usage across the world.
- An amazing amount of resources and tutorials.
- Easy to use inbuilt-functions.
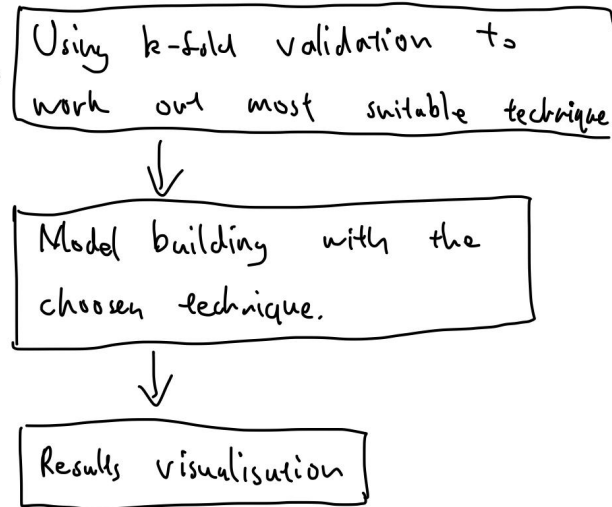- Can be understand by those who did not complete this course.

Cons:
- Data editing and viewing tools aren't as convenient as the one on matlab.
- No tutorials in class on python.

High Level Description of the Code

Data Preprocessing

Modeling

Initial data understanding

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Data cleaning

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Formatting & combining data sets

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Data visualisation

Using k-fold validation to work out most suitable technique

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Model building with the chosen technique.

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Results visualisation

Discussion and Challenges

- Regression approaches (linear, polynomial, decision tree) investigated the relationship between rice prices and influencing factors.

- Currency variation in food price data handled, models accurately predicted HDI.

- Unreliable weather data and limited availability of certain commodities and countries excluded from analysis.

- Future opportunities: Include socio-political variables, trade regulations, and market dynamics for enhanced models.

- Insights gained on rice price variations in developing nations, establishing correlations with quality of life indicators.

- Regression methodologies and K-Fold validation ensured robust and dependable models.

- Extensive validation, cross-referencing, and statistical methods crucial for accurate and trustworthy outcomes.

Project Management and Teamwork

- Clearly defined research scope and explicit project objectives were established at the beginning of the project.

- Specific nations, regions, and time periods were selected to focus on, providing a strong foundation for the project

- Communication challenges arose due to three team members working independently without involving or updating the rest of the team.

- Regular team meetings were conducted using Microsoft Teams and in-class tutorials to discuss progress, address issues, and provide updates. A communication channel via WhatsApp was established for specific areas of collaboration within the project.

- Tasks and responsibilities were assigned to team members based on their expertise and competence, maximizing individual contributions. Difficulties in finding a suitable time slot for collaboration posed challenges to the overall progress of the report.

Conclusion

- The project provided a comprehensive understanding of how HDI value in underdeveloped countries can be affected by their population and food price.
- The initial objectives were successfully achieved through adaptability and modifications during the project.
- Valuable new insights were gained about the topic at hand.
- Future work can involve expanding the analysis's scope by considering additional variables and exploring how economy affects the HDI value.
- Utilizing more sophisticated machine learning techniques will enhance the accuracy and sophistication of the models.
- The development of research and project management contributed to the project
- Overall, the exercise deepened comprehension of the factors influencing HDI value in underdeveloped countries.