EXPLORE AI

2401 PT_DS | Regression Project Kick-Off

29 July - 09 September

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Introduction

Project Objectives

Educational Goal	Introduction to practical applications of Regression Analysis in Python focusing on forecasting CO2 emissions in Agriculture
Project Goal	Kick-Start the 6 Week Team project. Apply learned concepts and technical skills to a live dataset.
Collaborative Goal	Build on the use of collaborative tools introduced Python and expand on those tools to include: Trello for project management.
Final Outcome	Ability to deliver comprehensive analysis and presentation of findings, demonstrating technical and competence and team work.

The Project:

- The aim is to analyze and predict CO2 emissions from the agri-food sector, using data from the FAO and IPCC, to understand climate impacts and develop sustainable strategies for stakeholders including policymakers and agricultural businesses.

The Dataset:

- Multiple features (30+)
- ~ 7000 records

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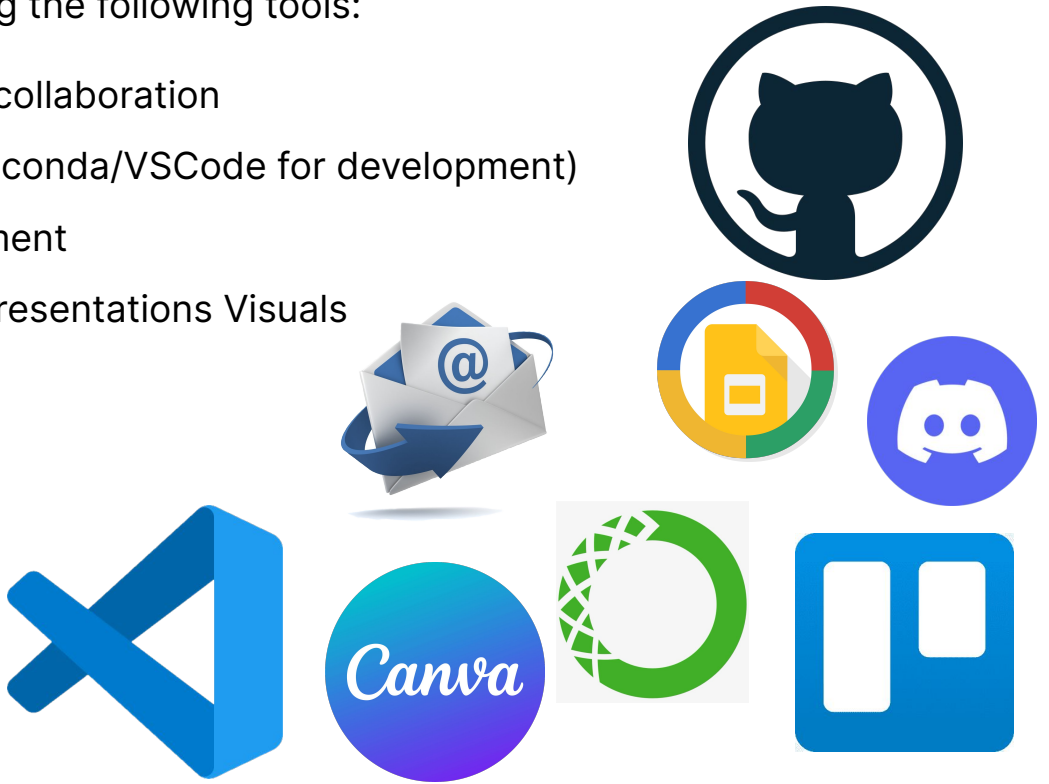
Overview of Tools

In this project we would be using the following tools:

- Github for versioning and collaboration
- Project Environments (Anaconda/VSCode for development)
- Trello for Project Management
- Google Slides/Canva for Presentations Visuals



GitHub

- GitHub & Git will be used for the project versioning and documentation.
- One team member should fork the **Project** repository and add the other team members as collaborators. **Please click here for the Project repository.**
- Ensure the repository is **Private**.
- Add you facilitator as a collaborator. Your facilitators GitHub User names will be shared in your Project Teams Emails.
- Every team member needs to clone the repo, create a branch, and work from there. **We will be accessing contributions (commits) to the repository from each member.**
- You will have to deal with merge conflicts 🙃
- Your GitHub repo will need a ReadMe file.
  Here is a helpful link to shortcuts in Markdown.

Python Overview

- You will need to include all the packages used in a requirements.txt file in your GitHub repository
- In the ReadMe you need to add instructions on how to recreate the environment using Anaconda.
- Here are a few helpful links to get you started:
  - Managing environments
  - From conda create requirements.txt for pip3
- Exporting your conda environment:

```
conda activate <env>
conda install pip
#get list of packages and pipe to txt file
pip list --format=freeze > requirements.txt
```

Team Roles and Collaboration Strategies

Trello

- All team members will be **required** to create a free Trello account. Click here to sign up if you do not have one.
- A team member should be assigned Project Manager to manage the Trello board
- The Project Manager will be responsible for creating a new board and inviting other team members to join.
- They will also be responsible for creating list, cards, assigning tasks, using labels and checklist to keep track of of the project.
- You can learn more about how to use Trello to manage this project by watching this video.

Slide Deck

- These are tools for creating beautiful engaging slides.

Project Timelines - Continued

Regression _ Week 1
29-07-2024 - 08-04-2024

- Submit Team Form / Team Preferences
- Get to know your Teammates and Facilitator, and ways of work.

Regression _ Week 2
05-08-2024 - 11-08-2024

- Understand the Dataset.
- Elect a team lead, project manager (manages trello), and share with your Facilitator.
- Set up all other collaborative and development tools required for the project.

Project Timelines - Continued

Regression _ Week 3
08-12-2024 - 18-08-2024

- Clean your dataset.
- Perform Exploratory Data Analysis on the Dataset.
- Begin working on the slide deck.

Regression _ Week 4
19-08-2024 - 25-08-2024

- Perform train-test splits.
- Train with a **minimum of 3 models.**
- Explore and decide on Model Evaluation Metrics.
- Compare and contrast models performance.
- Add all relevant information about the model to the slide deck (Model comparisons, evaluations, and others).

Project Timelines - Continued

Regression _ Week 5
26-08-2024 - 09-01-2024

- Continuation of Week 4 Deliverables

Regression _ Week 6
09-02-2024 - 08-09-2024

- Complete Deliverables → Send Completion Email, with all resources/deliverables included.

Submit by Deadline:

Monday, 09 September 2024 @ 11:59 PM CAT

Please note the Regression Exam [MCQ] is due the same day, plan your time carefully!

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Conclusion

Key Takeaways

- The Project is 6 weeks long.

  [Recommended in 5 weeks to give time for exam preparation.]

- Team size: 5-6 members
- You will be all be assigned a team you will work with, by default. **Should you wish to OPT out of working with a team, please fill out this form by Wednesday, 31 July 2024 @ 12:00.**

Deliverables:

- Trello for Project Task assignments and the entire project management.
- GitHub for collaboration and version control.
- Google Slide/Canva for presentation deck.
- Jupyter Notebook which should be:
  - Well formatted to contain all relevant sections
  - A robust and well annotated EDA.
  - At least 3 regression models.
  - A model comparison, selection, and recommendation section.

Important links

Please find below, important links:

- Project Repository: Click here
- Facilitator Github Usernames: Click here
- Managing Environments: Click here
- Creating environments from **requirements.txt** using "**conda create**": Click here
- Jupyter notebook markdown cheatsheet: Click here
- Sign-up to Trello: Click here
- Video on how to set-up your Trello board: click here

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Thank you