Industrial Internship Report on **"Optimizing agriculture production"** prepared by G.Jyoshna.

Preface:

During a 6 week DS&ML internship, I gained practical experience and knowledge in the field of data science.

The internship typically involves working with real-world data sets, using various analytical tools and techniques to extract insights and solve business problems.

The weekly quizzes helped me to test my knowledge and enhance my skills to apply the concepts to find the solutions for the problems.

A DS and ML internship can be highly beneficial for career development in several ways as follow:

- Provides practical experience
- Enhances the skill development
- Provides industry exposure
- Provides Resume enhancement
- Provides skill validation and confidence
- Helps to choose perfect career direction

A data science project that consists of building an engine for optimizing agricultural production.

Thanks to upskills campus and IOT academy in collaboration with industrial Unicoverage Technologies Pvt Ltd(UCT) for giving me this opportunity to learn practical work.

I would like to refer this internship providers to my juniors along with an advice that submit their weekly reports and attempt the quizzes before the end date to avoid many problems that my friends faced during the internship.

Problem Statement:

A data science project that consists of building an engine for optimizing agricultural production.

The goal is the build a predictive model to suggest the best crops that should be grown based on the climatic factors and the soil condition.

The dataset contains 8 columns

- Soil condition: N: Nitrogen, K: Potassium, P: Phosphorus, PH
- Climatic condition: temperature, rainfall, humidity

label: banana, rice, maize and etc.

Existing and proposed solution:

Existing solution:

There is a model that suggest the best crops based on soil conditions

Limitations:

- It is only based on the soil detection
- It doesn't suggest the crop that is suitable for the climatic conditions at that moment.
- So, it doesn't benefits the farmers much

- Proposed solution:

I added the climatic factors to the data set and generated the model to predict the crop based on both climatic and soil conditions

Github code link:

https://github.com/GangapalliJyoshna/UPSKILLCAMPUS

Proposed Model:

- Used numpy and pandas for data manipulation
- Used matplot library and seaborn for data visualization
- Checked the distribution of agriculture conditions from the data set
- Then, found the interesting patterns i.e crops that are grown with high Nitrogen\phosphrous\potassium
- Then classified the crops based on the seasons such as summer, winter, Rainy season using the parameters as follow:
    1. Temperature
    2. Humidity
    3. Label
- Now, clustering is done. I used KMeans clustering method for clustering the crops.
- Then, I splitted the data for predictive model
- The split data is labelled as training and testing sets for validation of results
- Now, I created a predictive model using Logistic Regression

Performance Test:

Constraints are as follow:

- memory limitations
- processing speed (MIPS)
- accuracy requirements

How I took care of the constraints in my project:

Memory Constraints:

Employed memory-efficient data structures and algorithms, optimized model size and considered memory constraints when choosing hardware.

Speed (MIPS) Constraints:

Used efficient algorithms and models to minimize computational complexity and processing time, and selected hardware with suitable processing capabilities.

Accuracy Constraints:

Conducted thorough hyperparameter tuning and model selection to strike a balance between accuracy and resource utilization. Considered trade-offs and the practical implications of different accuracy levels

My Learnings:

- I acquired strong basics on Machine learning and Data Science
- I acquired the skills that are necessary for a data science
- I became aware of the positions in Data science and difference between the roles as data science and data analyst
- I got an clear idea about how the interview questions would be?
- This program helped me to enchance my technical skills, analytical skills.
- It also helped me to gain courage and confidence to face the interview in future
- The project gave me an opportunity to gain a skill of applying the known concepts to real time problems