

<b>Project Title</b>	Wheat Kernel Classification
<b>Technologies</b>	Machine Learning
<b>Domain</b>	Agriculture
<b>Project Difficulties level</b>	Intermediate

### Problem Statement:

Measurements of geometrical properties of kernels belonging to three different varieties of wheat. A soft X-ray technique and GRAINS package were used to construct all seven, real-valued attributes. The examined group comprised kernels belonging to three different varieties of wheat: Kama, Rosa and Canadian, 70 elements each, randomly selected for the experiment.

The data set can be used for the tasks of classification and cluster analysis.

We have to classify them!!!

### Dataset:

You can get Dataset through this link: [Dataset](#)

The test group consisted of kernels from three different wheat varieties: Kama, Rosa, and Canadian, each with 70 components, chosen at random for the experiment. A soft X-ray approach was used to identify high-quality visualization of the interior kernel structure. It is non-destructive and far less expensive than more advanced imaging techniques such as scanning microscopy or laser technology. KODAK X-ray plates measuring 13x18 cm were used to capture the images. Combine harvested wheat grain from experimental fields was used in the research, which was carried out at the Institute of Agrophysics of the Polish Academy of Sciences in Lublin.

### Project Evaluation metrics:

#### Code:

- You are supposed to write a code in a modular fashion
- Safe: It can be used without causing harm.
- Testable: It can be tested at the code level.
- Maintainable: It can be maintained, even as your codebase grows.

- Portable: It works the same in every environment (operating system)
- You have to maintain your code on GitHub.
- You have to keep your GitHub repo public so that anyone can check your code.
- Proper readme file you have to maintain for any project development.
- You should include basic workflow and execution of the entire project in the readme file on GitHub
- Follow the coding standards: <https://www.python.org/dev/peps/pep-0008/>

### Database:

- You are supposed to use a given dataset for this project which is a Cassandra database.
- <https://astra.dev/ineuron>

### Cloud:

- You can use any cloud platform for this entire solution hosting like AWS, Azure or GCP

### API Details or User Interface:

- You have to expose your complete solution as an API or try to create a user interface for your model testing. Anything will be fine for us.

### Logging:

- Logging is a must for every action performed by your code use the python logging library for this.

### Ops Pipeline:

- If possible, you can try to use AI ops pipeline for project delivery Ex. DVC, MLflow , Sagemaker , Azure machine learning studio, Jenkins, Circle CI, Azure DevOps , TFX, Travis CI

### Deployment:

- You can host your model in the cloud platform, edge devices, or maybe local, but with a proper justification of your system design.

### Solutions Design:

- You have to submit complete solution design strategies in HLD and LLD document

### **System Architecture:**

- You have to submit a system architecture design in your wireframe document and architecture document.

### **Latency for model response:**

- You have to measure the response time of your model for a particular input of a dataset.

### **Optimization of solutions:**

- Try to optimize your solution on code level, architecture level and mention all of these things in your final submission.
- Mention your test cases for your project.



### **Submission requirements:**

### **High-level Document:**

You have to create a high-level document design for your project. You can reference the HLD form below the link.

Sample link:

[HLD Document Link](#)

### **Low-level document:**

You have to create a Low-level document design for your project; you can refer to the LLD from the below link.

Sample link

[LLD Document Link](#)

**Architecture:** You have to create an Architecture document design for your project; you can refer to the Architecture from the below link.

Sample link

[Architecture sample link](#)

**Wireframe:** You have to create a Wireframe document design for your project; refer to the Wireframe from the below link.

**Demo link**

[Wireframe Document Link](#)

### **Project code:**

You have to submit your code GitHub repo in your dashboard when the final submission of your project.

**Demo link**

[Project code sample link :](#)

### **Detail project report:**

You have to create a detailed project report and submit that document as per the given sample.

**Demo link**

[DPR sample link](#)

**Project demo video:**

You have to record a project demo video for at least 5 Minutes and submit that link as per the given demo.

**Demo link**

[Project sample link :](#)

**The project LinkedIn a post:**

You have to post your project detail on LinkedIn and submit that post link in your dashboard in your respective field.

**Demo link**

[Linkedin post sample link :](#)

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