1. **Linear Regression va Logistic Regression**

|  |  |  |
| --- | --- | --- |
|  | **Linear Regression:** | **Logistic Regression:** |
| **Predicts:** | Continuous values (e.g., house prices, temperature, stock prices). | Categorical outcomes (e.g., whether an email is spam, a patient has a disease, or a customer will click an ad). |
| **Relationship:** | Assumes a linear relationship between independent and dependent variables. | Models the probability of an event occurring using a sigmoid function. |
| **Output:** | Predicts a continuous value. | Predicts the probability of a specific category or event occurring. |
| **Example:** | Predicting the price of a house based on its size and location. | Predicting whether a customer will click an ad based on their demographics and browsing history. |
| **Estimation:** | Uses ordinary least squares for parameter estimation | Uses maximum likelihood estimation for parameter estimation. |
| **Sigmoid Function:** |  | Maps the output to a range between 0 and 1, representing probabilities |

1. **Klibning asosiy xusiyatlari va ishlash kodi**

**Purpose:**

Klib aims to streamline common data analysis workflows, providing a collection of functions for tasks like data profiling, cleaning, visualization, and summarization.

**Key Features:**

* **Data Cleaning:** Includes functions for handling missing values, identifying and removing duplicates, and optimizing data types.
* **Data Visualization:** Offers tools for creating various plots and charts to explore data patterns.
* **Data Preprocessing:** Provides functions for preparing data for machine learning models, including feature engineering and scaling.
* **User-Friendly Interface:** Designed to be easy to use, even for those new to data analysis.

1. **Structured va Unstructured datasetlar orasidagi farq?**

|  |  |  |
| --- | --- | --- |
| Feature | Structured Data | Unstructured Data |
| Definition | Data organized in rows and columns with predefined schema. | Data without a fixed format or structure. |
| Format | Tabular format (e.g., CSV, Excel, SQL tables). | Non-tabular format (e.g., images, videos, text). |
| Storage | Stored in relational databases (e.g., MySQL, PostgreSQL). | Stored in data lakes, NoSQL databases, or cloud storage. |
| Data Type | Numerical, categorical, and easily defined. | Text, audio, video, images, etc. |
| Querying | Easily queried using SQL or other query languages. | Requires specialized tools for analysis (e.g., NLP for text, CV for images). |
| Scalability | Easier to manage in smaller to medium-scale datasets. | Often requires larger storage capacity and advanced processing. |
| Examples | Sales records, customer details, inventory data. | Social media posts, emails, video footage, audio files. |
| Processing Tools | SQL, Pandas, Excel. | TensorFlow, PyTorch, OpenCV, spaCy. |
| Analysis Complexity | Easier to analyze with statistical and analytical tools. | Requires advanced techniques like deep learning, NLP, or computer vision. |

1. **Ternary conditionals nima? Va uni qanday amalga oshiriladi?**

n = 5

res = "Even" if n % 2 == 0 else "Odd"

[option1] if [condition] else [option2]

print(res)

1. **Random Forest va Decision Tree orasidagi farq va o’xshashlik tomonlari?**

|  |  |  |
| --- | --- | --- |
| Feature | Random Forest | Decision Tree |
| Definition | An ensemble method that combines multiple decision trees for better accuracy and robustness. | A single tree structure used to make decisions based on feature splits. |
| Model Complexity | More complex as it involves multiple trees. | Simpler and easier to interpret. |
| Training Speed | Slower due to training multiple trees. | Faster since only one tree is built. |
| Prediction Speed | Slower since multiple trees are consulted. | Faster as only one tree is evaluated. |
| Overfitting | Less prone to overfitting due to averaging results across trees. | More prone to overfitting, especially on complex data. |
| Bias-Variance Tradeoff | Lower variance and slightly higher bias. | Lower bias but higher variance. |
| Interpretability | Harder to interpret since it’s a combination of many trees. | Easier to visualize and understand. |
| Performance | Generally better for complex datasets with many features. | Performs well on smaller datasets with clear patterns. |
| Example Use Cases | Fraud detection, recommendation systems, and large dataset predictions. | Simple decision-making models, educational examples, and interpretable AI. |

1. **Ensemble nima?**

In machine learning, an "ensemble" refers to a technique that combines the predictions of multiple models (called "base learners" or "weak learners") to create a stronger, more accurate predictive model

1. **Mutable nima?**

In Python, 'mutable' is **the ability of objects to change their values**.

1. **Listga istalgan joyiga element qo’shish qoidasi?**

 [insert()](https://www.geeksforgeeks.org/python-list-insert/): Inserts an element at a specified position.

 [append()](https://www.geeksforgeeks.org/python-list-append-method/): Adds an element to the end of the list.

 [extend()](https://www.geeksforgeeks.org/python-list-extend-method/): Adds elements from another list to the end of the current list.

1. **Dictionarga qanday element qo’shamiz/olib tashlaymiz?**

**Add items :**

* + Adding an item to the dictionary is done by using a new index key and assigning a value to it
    - * thisdict["color"] = "red"
  + The update() method will update the dictionary with the items from a given argument. If the item does not exist, the item will be added.
* thisdict.update({"color": "red"})

**Removing items:**

|  |  |
| --- | --- |
| [clear()](https://www.w3schools.com/python/ref_dictionary_clear.asp) | Removes all the elements from the dictionary |
| [pop()](https://www.w3schools.com/python/ref_dictionary_pop.asp) | Removes the element with the specified key |
| [popitem()](https://www.w3schools.com/python/ref_dictionary_popitem.asp) | Removes the last inserted key-value pair |

del - keyword removes the item with the specified key name:

**Dictinary mutable/immutable? Nimaga?**