# README for Clustering Task Notebook

# Clustering Task  
  
This repository contains a Jupyter Notebook titled \*\*"Clusteringtask.ipynb"\*\*, which focuses on clustering techniques for data segmentation and pattern discovery. The notebook involves data exploration, preprocessing, clustering implementation, and visualization.  
  
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## Features of the Notebook  
  
- \*\*Data Exploration\*\*:  
 - Summary statistics and data visualization.  
 - Understanding relationships and distributions.  
  
- \*\*Data Preprocessing\*\*:  
 - Handling missing values and outliers.  
 - Feature scaling for optimal clustering performance.  
  
- \*\*Clustering Techniques\*\*:  
 - K-Means Clustering.  
 - Hierarchical Clustering (Agglomerative).  
 - DBSCAN or other advanced methods (if applicable).  
  
- \*\*Evaluation Metrics\*\*:  
 - Silhouette Score.  
 - Inertia (for K-Means).  
 - Dendrogram Analysis (for hierarchical clustering).  
  
- \*\*Visualization\*\*:  
 - Scatter plots for clustered data.  
 - Cluster centroids and boundaries.  
  
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## Getting Started  
  
### Prerequisites  
Ensure you have the following installed:  
- Python 3.8 or above  
- Jupyter Notebook or Jupyter Lab  
- Required Python libraries:  
 - `pandas`  
 - `numpy`  
 - `matplotlib`  
 - `seaborn`  
 - `sklearn`  
 - `scipy` (if applicable for hierarchical clustering)  
  
### How to Run  
1. Clone the repository:  
 ```bash  
 git clone <repository-link>  
 cd <repository-folder>  
 ```  
2. Open the notebook:  
 ```bash  
 jupyter notebook "Clusteringtask.ipynb"  
 ```  
3. Run the cells sequentially to explore clustering and evaluate the results.  
  
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## Results  
  
- Segmented the data into meaningful clusters.  
- Identified key patterns and relationships within the dataset.  
- Provided insights for potential data-driven decision-making.  
  
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## Acknowledgements  
  
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- Guidance and resources provided by mentors from \*\*ExcelR\*\*.  
  
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