Titanic Project

Exploratory Data Analysis (EDA) and Machine Learning Modeling on Titanic Dataset

Objective:

- Explore and analyze the Titanic dataset to gain insights into the passengers' demographics and factors influencing survival.
- Implement machine learning models (Logistic Regression, K-Nearest Neighbors, and Support Vector Machines) to predict survival.

Dataset Description:

The dataset contains the following columns:

1. PassengerId
2. Survived (Target Variable: 0 for No, 1 for Yes)
3. Pclass (Passenger Class)
4. Name
5. Sex
6. Age
7. SibSp (Number of Siblings/Spouses Aboard)
8. Parch (Number of Parents/Children Aboard)
9. Ticket
10. Fare
11. Cabin
12. Embarked

Data Preprocessing:

- Know more about your data (e.g., shape, Information, Check missing values)
- Handle missing values in columns (especially Cabin, Age, and Embarked).
- Encode categorical variables (e.g., Sex, Embarked).

Visualize your data:

1. Create visualizations to show the distribution of some columns of data :
    - Survival based on different features.
    - Age distribution.
    - Class distribution.
    - Gender distribution.
    - Port of Embarkation distribution.
    - etc.
2. Analyze relationships:
    - Explore correlations between variables and draw the heatmap for it.
    - Investigate if certain groups of passengers were more likely to survive.
3. Count number of surviving people using plots.

Machine Learning Models:

1. **Logistic Regression:**
    - Implement logistic regression to predict survival.
    - Evaluate the model's performance using appropriate metrics.
2. **K-Nearest Neighbors (KNN):**
    - Apply KNN algorithm to predict survival.
    - Experiment with different values of k.
    - Evaluate and compare results.

3. **Support Vector Machines (SVM):**
    - Implement SVM for classification.
    - Tune hyperparameters if needed.
    - Evaluate and compare results.

Additional Notes:

- Be sure to comment on each code block to explain your thought process.
- Utilize markdown cells for additional explanations.

Good luck with your exploration and modeling!