Project Report: Mushroom Classification Using Machine Learning and Streamlit

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- **Project Title:**

Mushroom Classification Web App

- **Objective:**
  - To develop a machine learning model that predicts whether a mushroom is **edible** or **poisonous** based on its physical characteristics.
  - To build a simple and interactive **Streamlit web app** for users to input features and view the model's prediction.

- **Tools & Technologies Used:**
  - **Python**
  - **Scikit-learn** (for training and using the model)
  - **Joblib** (for saving/loading the model)
  - **Streamlit** (for creating the web app interface)

- **Procedure:**

1. **Data Understanding and Preprocessing:**
   - Used the Mushroom Dataset with features like cap shape, Odor, gill colour, etc.

- Encoded categorical variables to numerical form for model training.

2. **Model Building:**
    - Trained a classification model using **scikit-learn** (e.g., Decision Tree or Random Forest).
    - Saved the trained model as mushroom_model.pkl using joblib.
3. **Web App Development (Streamlit):**
    - Created a user-friendly interface with dropdowns and sliders for input.
    - Loaded the saved model and used it to predict mushroom edibility.
    - Displayed results in real-time on the web app.
4. **Running the App:**
    - Launched the app using streamlit run app.py.
    - Users can input features and get an instant prediction.

🔹 **Learning Outcomes:**

- Learned how to **build, train, and save a machine learning model** for classification tasks.
- Gained practical experience in **deploying ML models using Streamlit** for real-time predictions.