DROPOUT PREDICTION APP DOCUMENTATION AND USER GUIDE

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OVERVIEW

The School Dropout Prediction app is designed to help educational institutions predict student dropout risks based on various factors. By leveraging a machine learning model, the app provides insights to administrators and educators, enabling them to identify at-risk students and take preventive measures to improve retention.

Features

- **User-Friendly Interface**: The app provides a simple and intuitive user interface for easy data input.
- **Real-Time Predictions**: Users can input student data and receive immediate predictions regarding dropout likelihood.
- **Data Validation**: The app checks for empty fields and ensures that numeric fields are filled correctly, providing feedback to users.
- **Clear Output**: Predictions are clearly stated, informing users whether a student is likely to drop out, remain enrolled, or graduate.

Installation Instructions

The app is hosted on Streamlit, which means users do not need to install any software or run any code. Simply access the app via the provided URL.

Accessing the App

To use the School Dropout Prediction app:

1. Open a web browser.
2. Enter the URL of the deployed Streamlit app.
3. Wait for the app to load.

USER GUIDE

Input Fields

Users will need to input the following information about the student:

1. **Previous Qualification**: Numeric value representing the student's prior educational attainment.

2. **Debtor**: Numeric value (0 or 1) indicating whether the student has any debts owed. (0 = No, 1 = Yes)
3. **Tuition Fees Up-To-Date**: Numeric value (0 or 1) indicating whether the student has paid tuition fees. (0 = No, 1 = Yes)
4. **Educational Special Needs**: Numeric value (0 or 1) indicating if the student has any special educational needs. (0 = No, 1 = Yes)
5. **Scholarship Holder**: Numeric value (0 or 1) indicating whether the student holds a scholarship. (0 = No, 1 = Yes)
6. **International**: Numeric value (0 or 1) indicating whether the student is an international student. (0 = No, 1 = Yes)
7. **Curricular Units for 1st Semester**: Numeric inputs for various metrics related to curricular units (credited, enrolled, evaluations, approved, without evaluations, grade).
8. **Curricular Units for 2nd Semester**: Numeric inputs for various metrics related to curricular units (credited, enrolled, evaluations, approved, without evaluations, grade).
9. **Age at Enrollment**: Numeric value representing the student's age when they enrolled.

Example Usage

1. **Open the App**: Go to the app's URL.
2. **Fill in the Input Fields**:
    - Previous Qualification: 2
    - Debtor: 0
    - Tuition Fees Up-To-Date: 1
    - Educational Special Needs: 1
    - Scholarship Holder: 0
    - International: 0
    - Curricular Units 1st Semester Credited: 4
    - Curricular Units 1st Semester Enrolled: 5
    - Curricular Units 1st Semester Evaluations: 3
    - Curricular Units 1st Semester Approved: 2
    - Curricular Units 1st Semester Without Evaluations: 1
    - Curricular Units 1st Semester Grade: 85
    - Curricular Units 2nd Semester Credited: 4
    - Curricular Units 2nd Semester Enrolled: 5
    - Curricular Units 2nd Semester Evaluations: 3
    - Curricular Units 2nd Semester Approved: 2
    - Curricular Units 2nd Semester Without Evaluations: 1
    - Curricular Units 2nd Semester Grade: 90
    - Age at Enrollment: 18
3. **Make a Prediction**: Click the "Predict" button.

Prediction Outcomes

After clicking the "Predict" button, the app will display one of the following messages:

- **"The student will drop out."**
- **"The student enrolled."**
- **"The student will graduate."**

Error Handling

- **Empty Fields**: If any input fields are empty, an error message will prompt the user to fill in all fields.
- **Invalid Inputs**: If non-numeric values are entered in numeric fields, an error message will indicate that only numeric values are accepted.

MODEL LIMITATIONS AND APPROPRIATE USE CASES

Limitations

1. **Model Accuracy**: The predictive accuracy of the model is approximately **77%**. While this indicates a reasonably effective model, it also means that **23%** of the predictions may be incorrect**.** Users should interpret the predictions cautiously, especially when making significant decisions based on the app's output.
2. **Generalization**: The model did not account for all factors that may affect student dropout rates. Aspects such as mental health, and personal circumstances can influence a student dropping out but are not captured in the input data.
3. **Data Quality**: The accuracy of predictions relies heavily on the quality and representativeness of the training data. If the model was trained on biased or incomplete data, it may lead to inaccurate predictions.
4. **Dynamic Nature of Education**: Educational environments are dynamic and can change over time. Factors influencing dropout rates may vary by year or context. If the model is not regularly updated to reflect new trends and data, its reliability may decrease.

Appropriate Use Cases

1. **Early Intervention**: The app can be effectively used by educational administrators to identify at-risk students early in their academic journey, allowing for timely interventions.

2. **Program Evaluation**: The app can help institutions evaluate the effectiveness of retention programs by predicting dropout risks before and after implementing new strategies.
3. **Resource Allocation**: Schools can use the insights from the app to allocate resources more effectively, focusing support on students who are predicted to be at higher risk of dropping out.
4. **Academic Counseling**: Academic advisors can leverage the app's predictions to tailor their counseling efforts based on the specific risks identified for individual students.

CONCLUSION

The School Dropout Prediction app is a valuable tool for educational institutions aiming to enhance student retention. By providing predictive insights based on various student factors, the app enables proactive measures to support at-risk students. However, users should be mindful of the model's limitations and use it as one of many tools in their retention strategies.