

# Student Dropout Prediction ML App – User Guide

## Introduction

This guide will walk you through using the Student Dropout Prediction ML App, a web-based tool for predicting whether a student is likely to drop out based on several academic and personal factors. The guide will also provide examples to help you understand how to use the app effectively.

## Getting Started

To use the app, follow these steps:

### 1. Launch the App:

- If running locally, open your terminal and run the command

```
streamlit run app.py
```

- If deployed on a cloud platform, simply navigate to the provided URL in your browser.

### 2. App Interface:

Once the app is running, you'll see a simple interface asking for various inputs related to the student's academic history and personal details. You will need to fill in each field to get a prediction.

### 3. Input Fields

Below are the input fields you will see on the app interface, along with explanations:

- Curricular Units 2nd Semester (Approved): The number of courses or subjects that the student passed in the second semester. Example: Enter `5` if the student passed 5 courses.
- Curricular Units 2nd Semester (Grade): The average grade the student received for all courses in the second semester. Example: Enter `75.5` if the student's average grade was 75.5%.
- Curricular Units 1st Semester (Approved): The number of courses the student passed in the first semester. Example: Enter `4` if the student passed 4 courses.
- Curricular Units 1st Semester (Grade): The average grade the student received for the first semester. Example: Enter `70.0` if the student's average grade was 70.0%.
- Tuition Fees Up to Date: Select whether the student has paid their tuition fees. Example: Select `Up to date` if the student has cleared all dues or `Not up to date` otherwise.
- Age at Enrollment: Select the student's age group when they first enrolled in the program. Example: Select `18-24` if the student was aged between 18 and 24 at enrollment.
- Admission Grade: The grade the student obtained during their admission or entrance exam. Example: Enter `85` if the student had an admission grade of 85%.
- Previous Qualification Grade: The grade obtained in the student's last qualification before enrolling in the current program. Example: Enter `90` if the student's previous qualification grade was 90%.
- Curricular Units 2nd Semester (Evaluations): The number of evaluations (tests, assignments, or exams) the student completed in the second semester. Example: Enter `8` if the student completed 8 evaluations.

## Predicting the Outcome

Once you have filled out all the input fields:

1. Click the 'Predict' Button: After entering all necessary details, click the 'Predict' button at the bottom of the screen.

2. View the Result: The app will process the inputs using the pre-trained machine learning model and display the result at the bottom of the screen.

- The result will be either:
  - Dropout: Indicating that the student is at risk of dropping out, or
  - Not Dropout: Indicating that the student is not likely to drop out.

### **Examples on How To Use.**

#### **Example 1: Predicting for a Well-Performing Student**

- Curricular Units 2nd Semester (Approved): 5
- Curricular Units 2nd Semester (Grade): 78.5
- Curricular Units 1st Semester (Approved): 6
- Curricular Units 1st Semester (Grade): 80.0
- Tuition Fees Up to Date: Up to date
- Age at Enrollment: 18-24
- Admission Grade: 85
- Previous Qualification Grade: 88
- Curricular Units 2nd Semester (Evaluations): 7

Prediction: Not Dropout

This student is likely performing well in both semesters, has up-to-date tuition payments, and a good admission grade, which suggests that they are not at risk of dropping out.

#### **Example 2: Predicting for a Struggling Student**

- Curricular Units 2nd Semester (Approved): 2
- Curricular Units 2nd Semester (Grade): 55.0
- Curricular Units 1st Semester (Approved): 3
- Curricular Units 1st Semester (Grade): 60.0
- Tuition Fees Up to Date: Not up to date
- Age at Enrollment: 25-34
- Admission Grade: 65
- Previous Qualification Grade: 70
- Curricular Units 2nd Semester (Evaluations): 4

Prediction: Dropout

This student shows lower academic performance, struggles with paying tuition, and fewer evaluations completed. As a result, the app predicts a dropout risk.

### **Optimizing the App Experience**

To ensure the best experience when using the app:

- Use a Stable Internet Connection: A good internet connection is needed for seamless interaction with the app, especially when hosted in the cloud.
- Provide Accurate Data: Ensure all the input values are accurate, as they directly influence the prediction outcome.
- Understand the Predictions: The app's prediction is based on past patterns and trends seen by the model. It should not be taken as absolute, but rather as an indication of potential risk.

### **Common Questions**

Q: Can I trust the predictions made by this app?

A: The app uses a machine learning model trained on historical data to predict dropout risks. While it provides useful insights, it's important to treat the predictions as one factor in decision-making and consider additional context.

Q: What do I do if a student is predicted to drop out?

A: If a student is predicted to drop out, consider reaching out to them for support, addressing any issues they may have (academic, financial, or personal), and providing resources or guidance to help them improve their situation.

Q: Can I add new factors to the prediction model?

A: The current version of the app is based on predefined inputs. Adding new factors would require retraining the machine learning model with additional data, which would need further development and updates.

### **Troubleshooting.**

- App is slow or unresponsive: This could be due to limited system resources or network issues. Try refreshing the page or checking your internet connection.
- Error when loading the model: Ensure that the model file (`best\_rf\_model.pkl`) is located in the correct path and that the necessary Python libraries are installed.

### **Conclusion**

The Student Dropout Prediction ML App is a powerful tool for predicting student dropout risk based on academic and personal factors. By leveraging machine learning, the app provides educators and administrators with valuable insights, helping them identify at-risk students and intervene before dropout occurs. Follow this user guide to get the best results from the app, and remember to use the predictions as a supportive tool in decision-making.