==========

☀**About BrightPath Academy:**

BrightPath Academy is a forward-thinking high school that combines academic excellence with holistic development. Located in a diverse, urban setting, BrightPath emphasizes not only classroom performance but also participation in extracurricular activities and personal growth.

☀**Mission:**

To empower students through personalized education and early academic interventions, ensuring every learner reaches their full potential.

☀**The Problem BrightPath Academy Faces:**

Despite its commitment to academic excellence and holistic development, BrightPath Academy faces several challenges that hinder its ability to fully support every student:

- **Delayed Identification of At-Risk Students**: Without real-time insights, some students who are struggling academically go unnoticed until it's too late for timely intervention.
- **Lack of Targeted Support Strategies**: Educators need better tools to tailor interventions such as tutoring or mentoring to the specific needs of each student.
- **Unclear Impact of Extracurricular Activities**: While extracurricular involvement is encouraged, there is limited data to understand how these activities influence academic performance.
- **Data Overload Without Actionable Insights**: Teachers and counsellors collect a wealth of data, but lack a centralized, intuitive platform to translate it into meaningful actions for student support.

Steps to Follow:

NB: Use Student_performance_data for this particular project.

This dataset contains comprehensive information high school students, detailing their demographics, study habits, parental involvement, extracurricular activities, and academic performance.

The target variable, **GradeClass**, classifies students' grades into distinct categories, providing

a robust dataset for educational research, predictive modeling, and statistical analysis.

Student Information

- **StudentID**: A unique identifier assigned to each student (1001 to 3392).

Demographic details

- **Age**: The age of the students ranges from 15 to 18 years.
- **Gender**: Gender of the students, where 0 represents Male and 1 represents Female.
- **Ethnicity**: The ethnicity of the students, coded as follows:
  0: Caucasian
  1: African American
  2: Asian
  3: Other
- **ParentalEducation**: The education level of the parents, coded as follows:
  0: None
  1: High School
  2: Some College
  3: Bachelor's
  4: Higher Study

Study Habits

- **StudyTimeWeekly**: Weekly study time in hours, ranging from 0 to 20.
- **Absences**: Number of absences during the school year, ranging from 0 to 30.
- **Tutoring**: Tutoring status, where 0 indicates No and 1 indicates Yes.

Parental Involvement

- **ParentalSupport**: The level of parental support, coded as follows:

  0: None

  1: Low

  2: Moderate

  3: High

  4: Very High

Extracurricular Activities

- **Extracurricular**: Participation in extracurricular activities, where 0 indicates No and 1 indicates Yes.
- **Sports**: Participation in sports, where 0 indicates No and 1 indicates Yes.
- **Music**: Participation in music activities, where 0 indicates No and 1 indicates Yes.
- **Volunteering**: Participation in volunteering, where 0 indicates No and 1 indicates Yes.

Academic Performance

- **GPA**: Grade Point Average on a scale from 2.0 to 4.0, influenced by study habits, parental involvement, and extracurricular activities.

Target Variable: Grade Class

- **GradeClass**: Classification of students' grades based on GPA:
  0: 'A' (GPA >= 3.5)
  1: 'B' (3.0 <= GPA < 3.5)
  2: 'C' (2.5 <= GPA < 3.0)
  3: 'D' (2.0 <= GPA < 2.5)
  4: 'F' (GPA < 2.0)

1. Problem Statement
2. Hypothesis Generation
3. Getting the system ready and loading the data
4. Understanding the data
5. Exploratory Data Analysis
   i. Perform Univariate Analysis
   ii. Perform Bivariate Analysis
6. Missing value and outlier treatment
7. Evaluation Metrics for classification problem
8. Feature engineering
9. Model Building: Part 1 (Apply baseline machine learning classification algorithms: Logistic Regression, Random Forest, and XGBoost with step 8)
10. Model building: part 2 (Apply Deep Learning classification algorithm with step 8)
11. Model deployment - Dash app on https://www.render.com

----------Based on this template can you develop a guided project for the given data