FUNCTIONAL SPECIFICATION DOCUMENT (FSD)

Project Title: Student Performance Analyzer

1. Introduction

1.1 Purpose

This Functional Specification Document (FSD) describes the detailed functional behavior of the **Student Performance Analyzer** system.
It explains **how the system will work**, based on the approved Business Requirements Document (BRD).

1.2 Scope

The document covers:

- Student data handling
- Performance and attendance analysis
- Risk identification
- Subject-wise average calculation
- Output and reporting behavior

2. System Overview

The Student Performance Analyzer is a data-driven system that processes student academic and attendance data to:

- Classify performance levels
- Identify at-risk students
- Highlight attendance issues
- Provide subject-wise insights

The system works on structured input data such as Excel or CSV files.

3. User Roles

Role	Description
Admin	Uploads data and manages system
Faculty	Views performance and attendance results
Management	Reviews reports and insights

4. Data Inputs

4.1 Input Data Fields

Field Name	Description
Student_ID	Unique identifier for each student
Name	Student name
Subject	Subject enrolled
Grade	Marks obtained
Attendance_%	Attendance percentage

5. Functional Specifications

5.1 Student Data Processing

- The system shall accept student data in tabular format
- Each record must contain Student_ID
- Missing mandatory fields shall be flagged as invalid
- Data shall be validated before analysis

5.2 Performance Status Calculation

Logic:

- Grade ≥ 75 → **High**
- Grade between 50 and 74 → **Average**
- Grade < 50 → **Low**

Output Field: Performance_status

5.3 Attendance Evaluation

Logic:

- Attendance ≥ 75% → **OK**
- Attendance < 75% → **Attendance Issue**

Output Field: Attendance_flag

5.4 At-Risk Student Identification

Logic:

- If Performance_status = Low OR Attendance < 60% → **At_Risk = Yes**
- Otherwise → **At_Risk = No**

Output Field: At_Risk

5.5 Subject-Wise Average Calculation

- The system shall calculate average marks per subject
- The average shall be displayed for each student record
- Calculations shall be automatic and accurate

Output Field: Subject_wise_avg

6. Output Data Structure

Field Name	Description
Performance_status	High / Average / Low
At_Risk	Yes / No
Attendance_flag	OK / Attendance Issue
Subject_wise_avg	Average marks per subject

7. Error Handling

- Invalid or missing data shall be highlighted
- Duplicate Student_IDs shall be flagged
- System shall not process incomplete records

8. Non-Functional Specifications

- System shall process at least 100 records efficiently
- Performance calculations shall complete within seconds
- System shall be user-friendly and readable
- Data integrity shall be maintained

9. Assumptions

- Input data is provided in Excel or CSV format
- Evaluation rules are predefined and fixed
- No real-time data updates

10. Constraints

- System is for internal academic use only
- No external API integrations
- No role-based authentication in current phase

11. Dependencies

- Clean and structured input data
- Defined performance evaluation rules

- Availability of required subject data

12. Acceptance Criteria

- All students receive correct performance status
- At-risk students are correctly identified
- Attendance issues are accurately flagged
- Subject-wise averages are correctly calculated