The Module split and interaction diagram

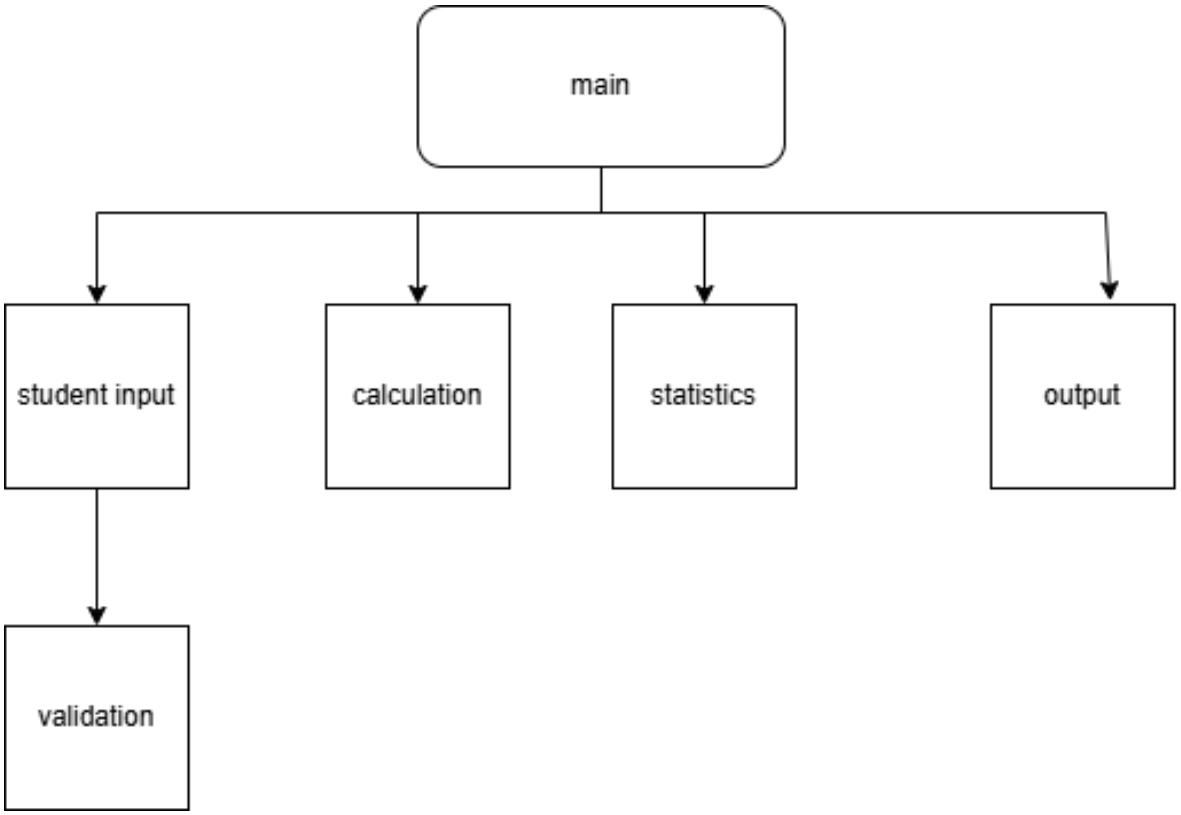

Fig: Module Interaction Diagram

This diagram shows how the Student Result Processing System is divided into different modules.
The main module controls the flow of execution. It calls the input, validation, calculation, statistics, and output modules. Each module performs a specific task, which improves modularity and reusability.

Documentation - Student Result Processing System

Module 1: Main Module

Module Name: main

Input: name of the input file entered by the user.

Pre-condition:

- The input file should exist
- The file should contain valid student data

Logic:

1. Ask the user to enter the input file name
2. Open the input file
3. Call the student input module to read student details
4. Call the calculation module to calculate total, percentage, grade, and CGPA
5. Call the statistics module to calculate class statistics
6. Call the output module to write results into output file
7. Close all opened files

Output: student results and statistics stored in output file.

Module 2: Student Input Module

Module Name: student_input

Input: Input file pointer

Pre-condition: Input file must be opened successfully

Logic:

1. Read student ID, name and marks from the given input file using the file pointer.
2. Validate the data using validation module.
3. Store onlyvalid student data in the student structure

Output: List of student records.

Module 3: Validation Module

Module Name: validation

Input:

- Student ID
- Student Name
- Marks

Pre-condition: Input values must not be empty or null.

Logic:

1. Check whether student ID contains only letters and numbers(alpha numeric).
2. Check whether name contains only alphabets or not.
3. Check whether marks are between 0 and 100.

Output: Result of the validation(valid or invalid).

Module 4: Calculation Module

Module Name: calculation

Input: student records

Pre-condition: Marks must be valid

Logic:

1. Add marks of all subjects to get total.
2. Calculate percentage
3. Assign grade based on percentage
4. Calculate CGPA

Output: updated student records with Total, Percentage , Grade and CGPA.

Module 5: Statistics Module

Module Name: statistics

Input: Student records

Pre-condition: At least one student record should be present.

Logic:

1. Find highest percentage in the class.
2. Find lowest percentage in the class.
3. Calculate average percentage.

Output: Class Statistic Values .

Module 6: Ouput Module

Module Name: output

Input:

- Student records
- Class statistics

Pre-condition: output file must be writable.

Logic:

Open output file

Write student details in a readable format

Write class statistics

Close output file

Output: Output file containing final student results and statistics.