CGPA Calculator

This program calculates the Cumulative Grade Point Average (CGPA) for three subjects based on the marks obtained. It then displays the CGPA for each subject along with the total CGPA.

How It Works

1. User inputs marks for three subjects (out of 100).
2. For each subject, the program calculates CGPA using predefined criteria.
3. The CGPA for each subject is displayed along with the result (Pass/Fail).
4. The total CGPA is calculated as the average of CGPA for all subjects.
5. The total CGPA is displayed along with the result (Pass/Fail).

Code Explanation

The provided C code consists of functions to calculate CGPA for a subject and to print the result. In the main function, it takes input for three subjects, calculates CGPA for each, and then calculates the total CGPA.

Function: calculateSubjectCGPA()

This function calculates the CGPA for a given subject based on the marks obtained.

```
#include <stdio.h>

// Calculate CGPA for a subject
float calculateSubjectCGPA(int marks) {
    if (marks >= 90 && marks <= 100) {
        return 4.0;  // Highest grade
    } else if (marks >= 80 && marks < 90) {
        return 3.7;
    } else if (marks >= 70 && marks < 80) {
        return 3.3;
    } else if (marks >= 60 && marks < 70) {
        return 3.0;
    } else if (marks >= 50 && marks < 60) {
        return 2.7;
    } else if (marks >= 40 && marks < 50) {
        return 2.3;
    } else {
        return 0.0; // Returning 0.0 for failing marks
    }
}
```

Function: printSubjectResult()

This function prints the CGPA for a subject along with the subject name and whether the student has passed or failed.

```
// Print subject result
void printSubjectResult(const char* subjectName, float cgpa) {
    printf("CGPA for %s: %.2f", subjectName, cgpa);
    if (cgpa < 2.0) {
        printf(" - Fail"); // If CGPA is less than 2.0, student fails
    }
    printf("\n");
}
```

Main Function: main()

The main function orchestrates the entire process, taking input, calculating CGPA, and displaying the results.

```
int main() {
    int marks_subject1, marks_subject2, marks_subject3;

    // Each subject input
    printf("Enter marks for subject 1 (out of 100): ");
    scanf("%d", &marks_subject1);

    printf("Enter marks for subject 2 (out of 100): ");
    scanf("%d", &marks_subject2);

    printf("Enter marks for subject 3 (out of 100): ");
    scanf("%d", &marks_subject3);

    // Calculate each subject
    float cgpa_subject1 = calculateSubjectCGPA(marks_subject1);
    float cgpa_subject2 = calculateSubjectCGPA(marks_subject2);
    float cgpa_subject3 = calculateSubjectCGPA(marks_subject3);

    // Display CGPA for each subject and total
    printSubjectResult("Subject 1", cgpa_subject1);
    printSubjectResult("Subject 2", cgpa_subject2);
    printSubjectResult("Subject 3", cgpa_subject3);

    float total_cgpa = (cgpa_subject1 + cgpa_subject2 + cgpa_subject3) / 3;

    // Display total CGPA
    printf("\nTotal CGPA: %.2f", total_cgpa);
    if (total_cgpa < 2.0) {
        printf(" - Fail"); // If total CGPA is less than 2.0, student fails
    }
    printf("\n");

    return 0;
}
```

Result