C-PROGRAMMING PROJECT DOCUMENTATION

Project Title: Exam Management System

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1. PROJECT TITLE
Exam Management System

2. PROJECT DESCRIPTION
The Exam Management System is a C programming project that allows efficient handling of exam-related student data. The system provides features such as adding student details, entering subject marks, calculating total marks, generating results, searching for a student record, and displaying all records.

The main purpose is to automate the exam result process and minimize manual work and calculation errors.

3. RESEARCH & BACKGROUND STUDY
Traditionally, exam results are maintained in registers or spreadsheets. This is time-consuming and prone to mistakes.

By using the C programming language:
- Structures can be used to store student details and marks.
- File handling ensures that records are saved and can be retrieved anytime.
- Functions make the program modular and easier to maintain.
- Decision-making statements can be used to determine pass/fail results.

4. SYSTEM DESIGN & IMPLEMENTATION
Algorithm (Implementation Approach):
1. Start
2. Display main menu:
- Add Student with Marks
- Display All Records
- Search Student by Roll No
- Exit
3. If "Add Student" selected → enter roll no, name, marks of subjects → calculate total and result (Pass/Fail).
4. Save record into file.
5. If "Display" selected → read all student records from file and display.
6. If "Search" selected → enter roll no, find and display record.
7. Repeat menu until Exit chosen.
8. Stop.

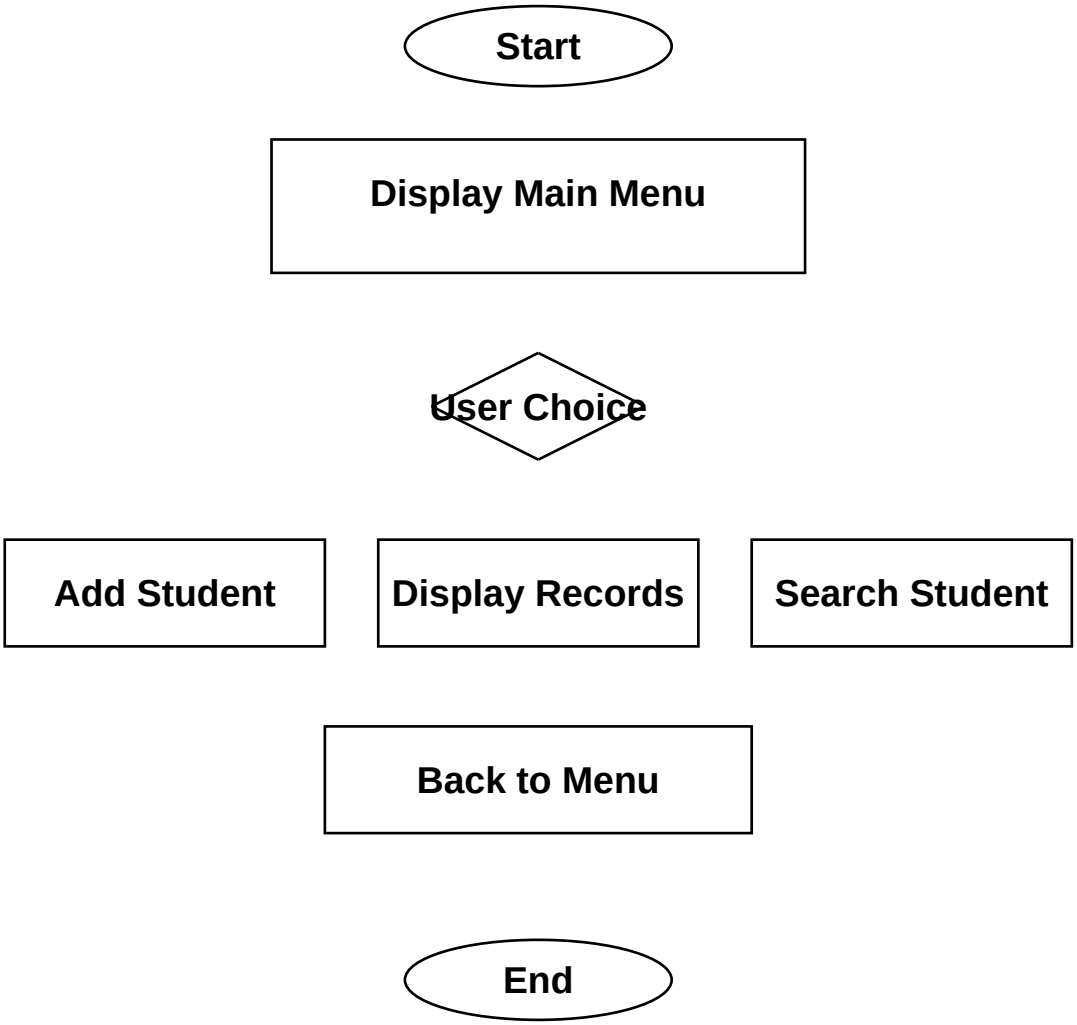
Implementation Concepts:
- Structures for Student (roll no, name, marks, total, result).
- File handling to store student records.
- Functions to add, display, and search records.
- If-else conditions to calculate pass/fail.

5. TESTING & RESULTS
Flow Chart (Testing):
START → Display Main Menu → Take User Choice → Perform Operation (Add/Display/Search) → Exit Selected?
If No → Loop Back | If Yes → STOP

Expected Results:
- System successfully adds student details with marks.
- Calculates total marks and determines pass/fail result.
- Displays all stored records correctly.
- Search feature works properly for given roll no.

6. CONCLUSION & FUTURE ENHANCEMENTS

Flowchart - Simple Version



Conclusion:
The Exam Management System automates the exam result process effectively. It reduces manual errors, saves time, and ensures proper record management of students' marks and results.

Future Enhancements:
- Adding multiple subjects dynamically.
- Implementing grade system (A, B, C, etc.) instead of just Pass/Fail.
- Generating graphical reports of student performance.
- Creating a GUI-based system for better usability.

7. C PROGRAM CODE

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

struct Student {
    int rollNo;
    char name[50];
    int marks1, marks2, marks3;
    int total;
    char result[10];
};

FILE *fp;

void addStudent() {
    struct Student s;
    fp = fopen("exam.dat", "ab");
    if (fp == NULL) {
        printf("Error opening file!\n");
        return;
    }
    printf("Enter Roll No: ");
    scanf("%d", &s.rollNo);
    printf("Enter Name: ");
    scanf(" %[^\n]", s.name);
    printf("Enter Marks of Subject 1: ");
    scanf("%d", &s.marks1);
    printf("Enter Marks of Subject 2: ");
    scanf("%d", &s.marks2);
    printf("Enter Marks of Subject 3: ");
    scanf("%d", &s.marks3);

    s.total = s.marks1 + s.marks2 + s.marks3;
    if (s.marks1 < 33 || s.marks2 < 33 || s.marks3 < 33)
        strcpy(s.result, "Fail");
    else
        strcpy(s.result, "Pass");

    fwrite(&s, sizeof(s), 1, fp);
    fclose(fp);
    printf("Student record added successfully!\n");
}

void displayStudents() {
    struct Student s;
    fp = fopen("exam.dat", "rb");
    if (fp == NULL) {
        printf("No records found!\n");
        return;
    }
    printf("\n--- Exam Records ---\n");
    while (fread(&s, sizeof(s), 1, fp)) {
        printf("Roll No: %d | Name: %s | Total: %d | Result: %s\n",
               s.rollNo, s.name, s.total, s.result);
    }
    fclose(fp);
}

void searchStudent() {
    int roll, found = 0;
    struct Student s;
```

```
    printf("Enter Roll No to search: ");
    scanf("%d", &roll);

    fp = fopen("exam.dat", "rb");
    if (fp == NULL) {
        printf("No records found!\n");
        return;
    }
    while (fread(&s, sizeof(s), 1, fp)) {
        if (s.rollNo == roll) {
            printf("Record Found -> Roll No: %d | Name: %s | Total: %d | Result: %s\n",
                   s.rollNo, s.name, s.total, s.result);
            found = 1;
            break;
        }
    }
    if (!found)
        printf("No record found for Roll No %d!\n", roll);
    fclose(fp);
}

int main() {
    int choice;
    do {
        printf("\n====== Exam Management System ======\n");
        printf("1. Add Student\n");
        printf("2. Display Students\n");
        printf("3. Search Student\n");
        printf("4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch(choice) {
            case 1: addStudent(); break;
            case 2: displayStudents(); break;
            case 3: searchStudent(); break;
            case 4: printf("Exiting program...\n"); break;
            default: printf("Invalid choice! Please try again.\n");
        }
    } while(choice != 4);
    return 0;
}
```

```
====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 1
Enter Roll No: 2541005
Enter Name: FAIZAN CHAUDHARY
Enter Marks of Subject 1: 86
Enter Marks of Subject 2: 78
Enter Marks of Subject 3: 69
Student record added successfully!

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 1
Enter Roll No: 2541003
Enter Name: CHIRAGSINGH
Enter Marks of Subject 1: 76
Enter Marks of Subject 2: 88
Enter Marks of Subject 3: 57
Student record added successfully!

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 1
Enter Roll No: 2541002
Enter Name: RAHILBAIG
Enter Marks of Subject 1: 76
Enter Marks of Subject 2: 556
Enter Marks of Subject 3: 66
Student record added successfully!

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 1
Enter Roll No: 2541015
Enter Name: PRANAV KAMBDE
Enter Marks of Subject 1: 77
Enter Marks of Subject 2: 66
Enter Marks of Subject 3: 55
Student record added successfully!

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 2

--- Exam Records ---
Roll No: 23 | Name: FAIZAN | Total: 224 | Result: Pass
Roll No: 2541005 | Name: FAIZAN CHAUDHARY | Total: 215 | Result: Pass
Roll No: 2541003 | Name: CHIRAGSINGH  | Total: 220 | Result: Pass
Roll No: 2541002 | Name: RAHILBAIG | Total: 210 | Result: Pass
Roll No: 2541005 | Name: FAIZAN CHAUDHARY | Total: 233 | Result: Pass
Roll No: 2541003 | Name: CHIRAGSINGH | Total: 221 | Result: Pass
Roll No: 2541002 | Name: RAHILBAIG | Total: 698 | Result: Pass
Roll No: 2541015 | Name: PRANAV KAMBDE | Total: 198 | Result: Pass

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice: 3
Enter Roll No to search: 2541005
Record Found -> Roll No: 2541005 | Name: FAIZAN CHAUDHARY | Total: 215 | Result: Pass

====== Exam Management System ======
1. Add Student
2. Display Students
3. Search Student
4. Exit
Enter your choice:
```