COMPUTER PROGRAMMING PROJECT

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TOPIC:TRACKER FOR STUDENT GRADES

DESCRIPTION

This programme computes the average grade of students by letting users enter the names of the students and their corresponding grades.

FEATURES

Input and display of student names and grades.

Calculation of average grades.

Error handling for invalid inputs.

Option to add or remove students from the list.

CONCEPT

ARRAYS AND STRUCTURES

An array is a collection of elements of the same data type, stored in contiguous memory locations. Arrays are useful when you need to work with a group of items, like a list of numbers or a collection of characters (strings).

A structure is a user-defined data type that groups variables of different data types together. Structures are useful for representing complex data more naturally, like a student record with a name, ID, and grade.

FILE HANDLING

File handling in C allows programs to create, read, write, and manage files stored on disk. C provides functions through the standard library to perform various file operations, which makes it possible to save data persistently, read configuration files, log output, and more.

Basics of File Handling in C

To perform file operations in C, you need to:

1. **Open a File: Using fopen() to specify the file and mode (read, write, append, etc.).**
2. **Perform Operations: Using functions like fprintf(), fscanf(), fwrite(), fread(), etc., to write data to or read data from the file.**
3. **Close the File: Using fclose() to release the resources and save changes to the file.**

CODE

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

#define MAX_STUDENTS 100

// Define the Student structure
struct Student {
  char name[50];
  float grade;
};

// Function prototypes
void addStudent(struct Student students[], int *count);
void displayStudents(const struct Student students[], int count);

int main() {
  struct Student students[MAX_STUDENTS];
  int studentCount = 0;
  int choice;

  while (1) {
    printf("\n--- Student Grade Tracker ---\n");
    printf("1. Add Student\n");
    printf("2. Display Students\n");
    printf("3. Exit\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);

    switch (choice) {
```

```
            case 1:
                addStudent(students, &studentCount);
                break;
            case 2:
                displayStudents(students, studentCount);
                break;
            case 3:
                printf("Exiting program.\n");
                exit(0);
            default:
                printf("Invalid choice. Please try again.\n");
        }
    }

    return 0;
}

// Function to add a student record
void addStudent(struct Student students[], int *count) {
    if (*count >= MAX_STUDENTS) {
        printf("Maximum student limit reached.\n");
        return;
    }

    struct Student newStudent;

    printf("Enter student's name: ");
    scanf(" %[^\n]", newStudent.name);  // Using " %[^\n]" to allow spaces in the name
    printf("Enter grade: ");
    scanf("%f", &newStudent.grade);

    students[*count] = newStudent;
    (*count)++;
```

```
    printf("Student added successfully.\n");
}

// Function to display all students' information
void displayStudents(const struct Student students[], int count) {
    if (count == 0) {
        printf("No students to display.\n");
        return;
    }

    printf("\n--- Student Records ---\n");
    for (int i = 0; i < count; i++) {
        printf("Student %d:\n", i + 1);
        printf("  Name: %s\n", students[i].name);
        printf("  Grade: %.2f\n\n", students[i].grade);
    }
}
```

OUTPUT

--- Student Grade Tracker ---

1. Add Student

2. Display Students

3. Exit

Enter your choice: 1

Enter student's name: Alice Johnson

Enter grade: 88.5

Student added successfully.

--- Student Grade Tracker ---

1. Add Student

2. Display Students

3. Exit

Enter your choice: 1

Enter student's name: Bob Smith

Enter grade: 91.0

Student added successfully.

--- Student Grade Tracker ---

1. Add Student

2. Display Students

3. Exit

Enter your choice: 2

--- Student Records ---

Student 1:

Name: Alice Johnson

Grade: 88.50

Student 2: Name: Bob Smith Grade: 91.00