# Student Management System

## ***Algorithm***

1. Start program
2. Initialize empty list student\_records
3. Display menu with options:
   * Add Student
   * Remove Student
   * Update Student Grade
   * View All Students
   * Exit
4. Prompt user for menu option
5. Based on input:
   * If Add Student:
     + Ask for name and grade
     + Categorise grade into HD/D/C/P/F
     + Add to list
   * If Remove Student:
     + Ask for name
     + Search and remove if found
   * If Update Student Grade:
     + Ask for name
     + Search and update grade + category
   * If View All Students:
     + Display each student with grade + category + message
   * If Exit:
     + Break loop
   * Else:
     + Show error message
6. Repeat until user selects exit
7. End program

## ***Flow chart***

A diagram of a student

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## ***Pseudocode***

START

Initialize student\_records as empty list

WHILE True DO

DISPLAY menu options:

1. Add Student

2. Remove Student

3. Update Student Grade

4. View All Students

5. Exit

PROMPT user for choice

IF choice == 1 THEN

PROMPT for name and grade

IF grade is between 0 and 100 THEN

COMPUTE category using get\_grade\_category()

APPEND {"name", "grade", "category"} to student\_records

ELSE

DISPLAY "Invalid grade"

ELSE IF choice == 2 THEN

PROMPT for name

SEARCH student\_records by name

IF found THEN

REMOVE student

ELSE

DISPLAY "Student not found"

ELSE IF choice == 3 THEN

PROMPT for name

SEARCH student\_records by name

IF found THEN

PROMPT for new grade

UPDATE grade and category

ELSE

DISPLAY "Student not found"

ELSE IF choice == 4 THEN

FOR EACH student in student\_records

DISPLAY name, grade, category, message

ELSE IF choice == 5 THEN

DISPLAY "Exiting program"

BREAK

ELSE

DISPLAY "Invalid choice"

END WHILE

END

## ***ChatGPT Interaction Transcript***

**1. Menu-Driven Control Flow**

**Question:**

ChatGPT, help me plan a menu-driven control flow logic for a Student Management System. I want to add, remove, update, view, and exit.

**ChatGPT Feedback:**  
I suggested a while True loop or a boolean running True flag to capture menu logic in a main\_menu() function. I provided a little pseudocode illustrating if-elif-else menu item routing.

**How I Implemented It:**  
Using a while True: loop within the main\_menu() method and channel each menu option to the corresponding additional functions such add\_student(), remove\_student(), etc.

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**2. Grade Categorisation**

**Your Question:**

Here's how I'm categorising grades: 85+ = HD, 75–84 = D, 65–74 = C, 50–64 = P, <50 = F. Can you suggest any way to optimise or improve this logic?

**ChatGPT Feedback:**  
I verified that your logic was correct, and for advanced usage, I offered a more scalable version that utilizes the bisect module. For clarification, I also included a get\_grade\_category() code using if-elif.

**How I Implemented It:**  
Using if-elif criteria for grade ranges, I followed the recommendations on the get\_grade\_category() function.

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**3. Data Storage with Lists/Tuples**

**Your Question:**

I'm using a list of tuples to store student names and grades. Are there better techniques or tips for manipulating this data structure?

**ChatGPT Feedback:**  
For more extensibility and readability, I advised switching from List[Tuple] to List[Dict]. I also discussed how keeping data like name, grade, and category by means of a dictionary enables you.

**How I Implemented It:**  
I went from a list of tuples to a list of dictionaries like {"name":..., "grade":..., "category":...}.

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**4. Loops and Exit Handling**

**Your Question:**

I use a while True loop to repeatedly show the menu until the user exits. Is there a better or more efficient way to handle user inputs and exit conditions?

**ChatGPT Feedback:**  
I advised using either while True: or while running: — either is OK. Additionally was advised to enclose the loop within a function (main\_menu()) to increase readability.

**How I Implemented It:**  
I handled user choices using if-elif and while True: within a well-defined main\_menu() function.

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