students = []

def add\_student():

student\_id = input("Enter ID: ").strip()

for s in students:

if s["id"] == student\_id:

print("⚠️ Student with this ID already exists.")

return

name = input("Enter Name: ").strip()

age = int(input("Enter Age: "))

course = input("Enter Course: ").strip()

marks = float(input("Enter Marks: "))

students.append({

"id": student\_id,

"name": name,

"age": age,

"course": course,

"marks": marks

})

print("✅ Student added successfully!")

def delete\_student():

student\_id = input("Enter Student ID to delete: ").strip()

global students

updated = [s for s in students if s["id"] != student\_id]

if len(updated) == len(students):

print("⚠️ Student not found.")

else:

students = updated

print("🗑️ Student deleted successfully!")

def search\_student():

query = input("Enter ID or Name to search: ").strip().lower()

results = [s for s in students if s["id"].lower() == query or s["name"].lower() == query]

if results:

for s in results:

print(s)

else:

print("⚠️ No student found.")

def filter\_students():

print("Filter Options: ")

print("1. By Course")

print("2. By Minimum Marks")

choice = input("Enter choice: ")

if choice == "1":

course = input("Enter course name: ").strip().lower()

results = [s for s in students if s["course"].lower() == course]

elif choice == "2":

min\_marks = float(input("Enter minimum marks: "))

results = [s for s in students if s["marks"] >= min\_marks]

else:

print("⚠️ Invalid choice.")

return

if results:

for s in results:

print(s)

else:

print("⚠️ No students match the criteria.")

def top\_k\_students():

if not students:

print("⚠️ No data available.")

return

k = int(input("Enter K value: "))

top\_students = sorted(students, key=lambda x: x["marks"], reverse=True)[:k]

print(f"🏆 Top {k} Students:")

for idx, s in enumerate(top\_students, 1):

print(f"{idx}. {s['name']} (Marks: {s['marks']})")

def menu():

while True:

print("\n==== Student Database ====")

print("1. Add Student")

print("2. Delete Student")

print("3. Search Student")

print("4. Filter Students")

print("5. Top-K Students")

print("6. Exit")

print("==========================")

choice = input("Enter choice: ").strip()

if choice == "1":

add\_student()

elif choice == "2":

delete\_student()

elif choice == "3":

search\_student()

elif choice == "4":

filter\_students()

elif choice == "5":

top\_k\_students()

elif choice == "6":

print("👋 Exiting... Goodbye!")

break

else:

print("⚠️ Invalid choice. Try again.")

menu()