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import json
import os

DATA_FILE = "student_data.json"

# ----- Utility Functions -----
def read_students():
    if os.path.isfile(DATA_FILE):
        with open(DATA_FILE, "r") as f:
            return json.load(f)
    return []

def write_students(data):
    with open(DATA_FILE, "w") as f:
        json.dump(data, f, indent=4)

def print_table(records):
    if len(records) == 0:
        print("\nNo records available right now.\n")
        return

    print("\nID".ljust(10), "Name".ljust(20), "Age".ljust(8), "Course".ljust(15))
    print("-" * 55)

    for record in records:
        print(
            str(record["id"]).ljust(10),
            record["name"].ljust(20),
            str(record["age"]).ljust(8),
            record["course"].ljust(15)
        )
    print()

# ----- CRUD Operations -----
def create_student():
    students = read_students()

    sid = input("Enter student ID: ").strip()
    for s in students:
        if s["id"] == sid:
            print("This ID already exists. Try a different one.")
            return

    name = input("Enter student name: ").strip()
    age = input("Enter age: ").strip()
    course = input("Enter course name: ").strip()

    if not age.isdigit():
        print("Age must be a valid number.")
        return

    students.append({
        "id": sid,
        "name": name,
        "age": int(age),
        "course": course
    })

    write_students(students)
    print("Student record saved successfully!")

def show_students():
    students = read_students()
    print_table(students)

def modify_student():
    students = read_students()
    sid = input("Enter student ID to update: ").strip()

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for student in students:
    if student["id"] == sid:
        student["name"] = input("New name: ").strip()
        new_age = input("New age: ").strip()
        if new_age.isdigit():
            student["age"] = int(new_age)
        student["course"] = input("New course: ").strip()

        write_students(students)
        print("Record updated successfully.")
        return

print("Student ID not found.")

def remove_student():
    students = read_students()
    sid = input("Enter student ID to delete: ").strip()

    updated_list = [s for s in students if s["id"] != sid]

    if len(updated_list) == len(students):
        print("No matching student found.")
    else:
        write_students(updated_list)
        print("Student record deleted.")

# ----- Main Program -----
def run_program():
    while True:
        print("\n===== Student Record Management =====")
        print("1. Add new student")
        print("2. View all students")
        print("3. Update student details")
        print("4. Delete student record")
        print("5. Exit")

        option = input("Choose an option (1-5): ").strip()

        if option == "1":
            create_student()
        elif option == "2":
            show_students()
        elif option == "3":
            modify_student()
        elif option == "4":
            remove_student()
        elif option == "5":
            print("Thank you for using the system.")
            break
        else:
            print("Invalid choice. Please select between 1 and 5.")

if __name__ == "__main__":
    run_program()

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===== Student Record Management =====
1. Add new student
2. View all students
3. Update student details
4. Delete student record
5. Exit
Choose an option (1-5): 1
Enter student ID: 234
Enter student name: abc
Enter age: 20
Enter course name: xyz
Student record saved successfully!

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===== Student Record Management =====
1. Add new student
2. View all students
3. Update student details
4. Delete student record
5. Exit
Choose an option (1-5): 

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