Assignment 3 python programming

Scenario 32: You are developing a Python-based student performance tracking system. The program should store student records (name, subject, score) in a list of dictionaries. The system should allow teachers to input student scores, calculate class averages, and generate a report showing students who scored above or below a certain threshold.

Tasks:

1. Develop Python code based on the case study to track student performance and calculate class averages.

2. Use a list of dictionaries to store student records (name, subject, score).

3. Implement functionality to calculate the class average score for each subject.

4. Generate a report showing students who scored above or below a specific threshold.

5. Use conditional statements to identify students who meet the threshold instead of using functions.

Deliverables:

1. Python program to track student performance, calculate averages, and generate reports based on thresholds.

2. Learning Outcomes: Students will learn how to store and manipulate data using dictionaries, calculate averages, and filter data based on conditional criteria. Here's a Python solution for the student performance tracking system:

# Initialize student records

student\_records = []

# Input student scores

while True:

print("\nOptions:")

print("1. Add student record")

print("2. Calculate class average")

print("3. Generate report")

print("4. Exit")

choice = input("Choose an option: ")

if choice == "1":

name = input("Enter student name: ")

subject = input("Enter subject: ")

score = float(input("Enter score: "))

student\_records.append({"name": name, "subject": subject, "score": score})

elif choice == "2":

subject = input("Enter subject: ")

subject\_scores = [record["score"] for record in student\_records if record["subject"] == subject]

if subject\_scores:

average = sum(subject\_scores) / len(subject\_scores)

print(f"Class average for {subject}: {average:.2f}")

else:

print(f"No records found for {subject}.")

elif choice == "3":

threshold = float(input("Enter threshold score: "))

above\_below = input("Show students who scored 'above' or 'below' threshold: ")

report = [record for record in student\_records

if (above\_below == "above" and record["score"] > threshold)

or (above\_below == "below" and record["score"] < threshold)]

print("Report:")

for record in report:

print(f"{record['name']}: {record['subject']}: {record['score']:.2f}")

elif choice == "4":

break

else:

print("Invalid option. Please choose again.")

Learning Outcomes

1. Data storage and manipulation using dictionaries

2. Calculating averages

3. Filtering data based on conditional criteria

Explanation

- Student Records: Stored in a list of dictionaries (student\_records).

- Conditional Statements: Used to identify students who meet the threshold.

- Class Average: Calculated using list comprehension and the sum function.

- Report Generation: Based on the threshold and above/below criteria.

Example Usage

1. Add student records:

- Enter student name: John Doe

- Enter subject: Math

- Enter score: 85

2. Calculate class average:

- Enter subject: Math

- Output: Class average for Math: 85.00

3. Generate report:

- Enter threshold score: 80

- Show students who scored 'above' or 'below' threshold: above

- Output: Report showing students who scored above 80

This program provides a basic student performance tracking system. Enhancements:

- Validate user input

- Implement data persistence (e.g., save to file or database)

- Add more features (e.g., student ranking, grade distribution)

- Improve report generation (e.g., include averages, charts)