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TW23

Activity 4: List and Tuple

Source Code:

```python
import json
import os

class StudentRecordManager:
    def __init__(self):
        self.records = []
        self.file_path = None

    def load_file(self, file_path):
        if os.path.exists(file_path):
            with open(file_path, 'r') as file:
                self.records = json.load(file)
                self.file_path = file_path
                print("File loaded successfully.")
        else:
            print("File does not exist.")

    def save_file(self):
        if self.file_path:
            with open(self.file_path, 'w') as file:
                json.dump(self.records, file, indent=4)
                print("File saved successfully.")
        else:
            print("No file opened. Use 'Save As' to specify a file.")

    def save_as_file(self, file_path):
        self.file_path = file_path
        self.save_file()

    def show_all_records(self):
        if not self.records:
            print("No records available.")
        else:
            for record in self.records:
                print(record)

    def order_by_last_name(self):
        self.records.sort(key=lambda x: x[1][1])
        print("Records sorted by last name.")
```

```python
    def order_by_grade(self):
        self.records.sort(key=lambda x: x[2] * 0.6 + x[3] * 0.4, reverse=True)
        print("Records sorted by grade.")

    def show_student_record(self, student_id):
        record = next((r for r in self.records if r[0] == student_id), None)
        print(record if record else "Student not found.")

    def add_record(self, student_id, first_name, last_name, class_standing, major_exam):
        self.records.append((student_id, (first_name, last_name), class_standing, major_exam))
        print("Record added successfully.")

    def edit_record(self, student_id, new_first_name=None, new_last_name=None, new_class_standing=None, new_major_exam=None):
        for i, record in enumerate(self.records):
            if record[0] == student_id:
                updated_record = (
                    student_id,
                    (new_first_name or record[1][0], new_last_name or record[1][1]),
                    new_class_standing if new_class_standing is not None else record[2],
                    new_major_exam if new_major_exam is not None else record[3],
                )
                self.records[i] = updated_record
                print("Record updated successfully.")
                return
        print("Student not found.")

    def delete_record(self, student_id):
        self.records = [r for r in self.records if r[0] != student_id]
        print("Record deleted if it existed.")


def main():
    manager = StudentRecordManager()

    while True:
```

```python
        print("""
1. Open File
2. Save File
3. Save As File
4. Show All Students Record
5. Order by Last Name
6. Order by Grade
7. Show Student Record
8. Add Record
9. Edit Record
10. Delete Record
11. Exit
""")
        choice = input("Enter your choice: ")

        if choice == '1':
            path = input("Enter file path: ")
            manager.load_file(path)
        elif choice == '2':
            manager.save_file()
        elif choice == '3':
            path = input("Enter new file path: ")
            manager.save_as_file(path)
        elif choice == '4':
            manager.show_all_records()
        elif choice == '5':
            manager.order_by_last_name()
        elif choice == '6':
            manager.order_by_grade()
        elif choice == '7':
            student_id = input("Enter Student ID: ")
            manager.show_student_record(student_id)
        elif choice == '8':
            student_id = input("Enter Student ID: ")
            first_name = input("Enter First Name: ")
            last_name = input("Enter Last Name: ")
            class_standing = float(input("Enter Class Standing Grade: "))
```

```python
113                    major_exam = float(input("Enter Major Exam Grade: "))
114                    manager.add_record(student_id, first_name, last_name, class_standing, major_exam)
115                elif choice == '9':
116                    student_id = input("Enter Student ID to edit: ")
117                    first_name = input("Enter new First Name (or press Enter to keep unchanged): ") or None
118                    last_name = input("Enter new Last Name (or press Enter to keep unchanged): ") or None
119                    class_standing = input("Enter new Class Standing Grade (or press Enter to keep unchanged): ")
120                    major_exam = input("Enter new Major Exam Grade (or press Enter to keep unchanged): ")
121                    manager.edit_record(student_id, first_name, last_name,
122                                        float(class_standing) if class_standing else None,
123                                        float(major_exam) if major_exam else None)
124                elif choice == '10':
125                    student_id = input("Enter Student ID to delete: ")
126                    manager.delete_record(student_id)
127                elif choice == '11':
128                    print("Exiting program.")
129                    break
130                else:
131                    print("Invalid choice. Try again.")
132
133    if __name__ == "__main__":
134        main()
135
```

Results:

```
PS C:\Users\John John\OneDrive\Documents\GitHub\it0011_Cortan> python

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 8
Enter Student ID: 202210825
Enter First Name: John
Enter Last Name: Cortan
Enter Class Standing Grade: 99
Enter Major Exam Grade: 99
Record added successfully.

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 8
Enter Student ID: 20231035
Enter First Name: MinaTozaki
Enter Last Name: Sana
Enter Class Standing Grade: 98
Enter Major Exam Grade: 98
Record added successfully.

        1. Open File
        2. Save File
```

```
              3. Save As File
              4. Show All Students Record
              5. Order by Last Name
              6. Order by Grade
              7. Show Student Record
              8. Add Record
              9. Edit Record
              10. Delete Record
              11. Exit

Enter your choice: 4
('202210825', ('John ', 'Cortan'), 99.0, 99.0)
('20231035', ('MinaTozaki', 'Sana'), 98.0, 98.0)

              1. Open File
              2. Save File
              3. Save As File
              4. Show All Students Record
              5. Order by Last Name
              6. Order by Grade
              7. Show Student Record
              8. Add Record
              9. Edit Record
              10. Delete Record
              11. Exit

Enter your choice: 5
Records sorted by last name.

              1. Open File
              2. Save File
              3. Save As File
              4. Show All Students Record
              5. Order by Last Name
              6. Order by Grade
              7. Show Student Record
              8. Add Record
              9. Edit Record
              10. Delete Record
              11. Exit

Enter your choice: 6
Records sorted by grade
```

```
Records sorted by grade.

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 9
Enter Student ID to edit: 202210825
Enter new First Name (or press Enter to keep unchanged): Rosedel
Enter new Last Name (or press Enter to keep unchanged): Cortan
Enter new Class Standing Grade (or press Enter to keep unchanged): 80
Enter new Major Exam Grade (or press Enter to keep unchanged): 85
Record updated successfully.

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 4
('202210825', ('Rosedel', 'Cortan'), 80.0, 85.0)
('20231035', ('MinaTozaki', 'Sana'), 98.0, 98.0)

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
```

```
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 10
Enter Student ID to delete: 123456
Record deleted if it existed.

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 4
('202210825', ('Rosedel', 'Cortan'), 80.0, 85.0)
('20231035', ('MinaTozaki', 'Sana'), 98.0, 98.0)

        1. Open File
        2. Save File
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 3
Enter new file path: students.json
File saved successfully.

        1. Open File
        2. Save File
```

```
        3. Save As File
        4. Show All Students Record
        5. Order by Last Name
        6. Order by Grade
        7. Show Student Record
        8. Add Record
        9. Edit Record
        10. Delete Record
        11. Exit

Enter your choice: 1
Enter file path: students.json
File loaded successfully.
```

```
Enter your choice: 11
Enter your choice: 11
Exiting program.
PS C:\Users\John John\OneDrive\Documents\GitHub\it0011_Cortan> []
```