In [4]:

```
students = []

# 1. Create Students
def create_students():
    global students
    students = [
        ("Alice", 101, (85, 90, 78), "B"),
        ("Bob", 102, (70, 75, 80), "C"),
        ("Charlie", 103, (95, 88, 92), "A"),
    ]
    print("Initial students created.\n")

# 2. Display All Students
def display_all_students():
    print("\nAll Students:")
    for s in students:
        print(f"Name: {s[0]}, Roll No: {s[1]}, Marks: {s[2]}, Grade: {s[3]}")
    print()

# 3. Add a New Student
def add_student(name, roll, marks, grade):
    global students
    student = (name, roll, marks, grade)
    students.append(student)
    print(f"Student {name} added.\n")

# 4. Search for a Student
def search_student(roll):
    for s in students:
        if s[1] == roll:
            print(f"Student Found: Name: {s[0]}, Roll No: {s[1]}, Marks: {s[2]}, Grade: {s[3]}\n")
            return
    print("Student not found.\n")

# 5. Calculate Total Marks
def calculate_total_marks():
    print("\nTotal Marks for each student:")
    for s in students:
        total = sum(s[2])
        print(f"{s[0]} (Roll {s[1]}): Total Marks = {total}")
    print()

# 6. Update Grades
def update_grade(roll, new_grade):
    global students
    updated = False
    for i in range(len(students)):
        if students[i][1] == roll:
            s = students[i]
            students[i] = (s[0], s[1], s[2], new_grade)
            updated = True
            print(f"Grade updated for Roll No {roll} to {new_grade}.\n")
            break
    if not updated:
        print("Student not found.\n")

# 7. Remove a Student
def remove_student(roll):
    global students
    for i in range(len(students)):
        if students[i][1] == roll:
            removed = students.pop(i)
            print(f"Student {removed[0]} with Roll No {roll} removed.\n")
            return
    print("Student not found.\n")

# Sample Execution
if __name__ == "__main__":
    create_students()
    display_all_students()

    add_student("David", 104, (82, 76, 88), "B")
    display_all_students()

    search_student(102)

    calculate_total_marks()

    update_grade(103, "A+")
    display_all_students()

    remove_student(101)
    display_all_students()
```

```
Initial students created.


All Students:
Name: Alice, Roll No: 101, Marks: (85, 90, 78), Grade: B
Name: Bob, Roll No: 102, Marks: (70, 75, 80), Grade: C
Name: Charlie, Roll No: 103, Marks: (95, 88, 92), Grade: A

Student David added.


All Students:
Name: Alice, Roll No: 101, Marks: (85, 90, 78), Grade: B
Name: Bob, Roll No: 102, Marks: (70, 75, 80), Grade: C
Name: Charlie, Roll No: 103, Marks: (95, 88, 92), Grade: A
Name: David, Roll No: 104, Marks: (82, 76, 88), Grade: B

Student Found: Name: Bob, Roll No: 102, Marks: (70, 75, 80), Grade: C


Total Marks for each student:
Alice (Roll 101): Total Marks = 253
Bob (Roll 102): Total Marks = 225
Charlie (Roll 103): Total Marks = 275
David (Roll 104): Total Marks = 246

Grade updated for Roll No 103 to A+.


All Students:
Name: Alice, Roll No: 101, Marks: (85, 90, 78), Grade: B
Name: Bob, Roll No: 102, Marks: (70, 75, 80), Grade: C
Name: Charlie, Roll No: 103, Marks: (95, 88, 92), Grade: A+
Name: David, Roll No: 104, Marks: (82, 76, 88), Grade: B

Student Alice with Roll No 101 removed.


All Students:
Name: Bob, Roll No: 102, Marks: (70, 75, 80), Grade: C
Name: Charlie, Roll No: 103, Marks: (95, 88, 92), Grade: A+
Name: David, Roll No: 104, Marks: (82, 76, 88), Grade: B
```

In [ ]:

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