Python-MySQL Connectivity Worksheet

Instructions: All solutions must use the `mysql-connector-python` library. Write **User-Defined Functions (UDFs)** to perform the operations. Assume the database is named `SchoolDB` and the table is `Student` with columns: `RollNo (INT PRIMARY KEY)`, `Name (VARCHAR)`, and `Marks (INT)`.

Worksheet Questions

1. **Establish Connection:** Write a function `GetConnection()` that establishes a connection to MySQL and returns the connection object.
2. **Insert Record:** Create a function `AddStudent(rno, name, marks)` that accepts student details and inserts them into the `Student` table.
3. **Read All Records:** Write a function `DisplayAll()` that fetches and displays all records from the `Student` table.
4. **Search Operation:** Define a function `SearchStudent(rno)` that takes a Roll Number as input and displays the record of that student.
5. **Update Record:** Create a function `UpdateMarks(rno, new_marks)` that updates the marks of a student for a given Roll Number.
6. **Delete Record:** Write a function `RemoveStudent(rno)` that deletes a specific student's record from the table.
7. **Filter Search:** Write a function `GetToppers()` that displays details of students who scored more than 90 marks.
8. **Aggregate Query:** Create a function `CountStudents()` that returns the total number of records in the `Student` table.
9. **Parameterized Query:** Write a function `SearchByName(name_part)` that searches for students whose names start with a specific string (using the `LIKE` operator).
10. **Delete All:** Write a function `ClearTable()` that deletes all records from the `Student` table but keeps the table structure intact.

Answer Key (Complete Python Code)

python

```python
import mysql.connector

# 1. Function to Establish Connection
def GetConnection():
    db = mysql.connector.connect(
        host="localhost",
        user="root",
        password="yourpassword",
        database="SchoolDB"
    )
    return db

# 2. Insert Operation
def AddStudent(rno, name, marks):
    conn = GetConnection()
    cursor = conn.cursor()
    query = "INSERT INTO Student (RollNo, Name, Marks) VALUES (%s, %s, %s)"
    cursor.execute(query, (rno, name, marks))
    conn.commit()
    print("Record Inserted.")
    conn.close()

# 3. Read Operation
def DisplayAll():
    conn = GetConnection()
    cursor = conn.cursor()
    cursor.execute("SELECT * FROM Student")
    records = cursor.fetchall()
    for row in records:
        print(row)
    conn.close()

# 4. Search Operation
def SearchStudent(rno):
    conn = GetConnection()
    cursor = conn.cursor()
    query = "SELECT * FROM Student WHERE RollNo = %s"
    cursor.execute(query, (rno,))
    record = cursor.fetchone()
    if record:
        print("Student Found:", record)
    else:
        print("No record found.")
    conn.close()

# 5. Update Operation
def UpdateMarks(rno, new_marks):
    conn = GetConnection()
    cursor = conn.cursor()
    query = "UPDATE Student SET Marks = %s WHERE RollNo = %s"
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    cursor.execute(query, (new_marks, rno))
    conn.commit()
    print(cursor.rowcount, "Record(s) updated.")
    conn.close()

# 6. Delete Operation
def RemoveStudent(rno):
    conn = GetConnection()
    cursor = conn.cursor()
    query = "DELETE FROM Student WHERE RollNo = %s"
    cursor.execute(query, (rno,))
    conn.commit()
    print("Record Deleted.")
    conn.close()

# 7. Filter Search
def GetToppers():
    conn = GetConnection()
    cursor = conn.cursor()
    cursor.execute("SELECT * FROM Student WHERE Marks > 90")
    for row in cursor.fetchall():
        print(row)
    conn.close()

# 8. Aggregate Function
def CountStudents():
    conn = GetConnection()
    cursor = conn.cursor()
    cursor.execute("SELECT COUNT(*) FROM Student")
    count = cursor.fetchone()[0]
    conn.close()
    return count

# 9. Search with LIKE operator
def SearchByName(name_part):
    conn = GetConnection()
    cursor = conn.cursor()
    query = "SELECT * FROM Student WHERE Name LIKE %s"
    cursor.execute(query, (name_part + '%',))
    for row in cursor.fetchall():
        print(row)
    conn.close()

# 10. Delete All Records
def ClearTable():
    conn = GetConnection()
    cursor = conn.cursor()
    cursor.execute("DELETE FROM Student")
    conn.commit()
    print("Table cleared.")
    conn.close()
```