**Database Design Document**

计算机科学与技术（全英创新班）

import sqlite3

db = sqlite3.connect('Database.db')

cursor = db.cursor()

# ------------------------------------Create Tables -------------------------------------

# Create Students Table

cursor.execute('''

DROP TABLE IF EXISTS Students

CREATE TABLE IF NOT EXISTS Students (

StudentID TEXT PRIMARY KEY CHECK(length(StudentID) = 10),

StudentName TEXT NOT NULL,

Sex TEXT CHECK(Sex IN ('male', 'female')),

EntranceAge INTEGER CHECK(EntranceAge BETWEEN 10 AND 50),

EntranceYear INTEGER NOT NULL,

Class TEXT NOT NULL

)

''')

# Create Course Table

cursor.execute('''

DROP TABLE IF EXISTS Courses

CREATE TABLE IF NOT EXISTS Courses (

CourseID TEXT PRIMARY KEY CHECK(length(CourseID) = 7),

CourseName TEXT NOT NULL,

TeacherID TEXT NOT NULL CHECK(length(TeacherID) = 5),

Credit REAL NOT NULL,

Grade INTEGER NOT NULL,

CanceledYear INTEGER,

FOREIGN KEY (TeacherID) REFERENCES Teachers(TeacherID)

)

''')

# Create Teacher Table

cursor.execute('''

DROP TABLE IF EXISTS Teachers

CREATE TABLE IF NOT EXISTS Teachers (

TeacherID TEXT PRIMARY KEY CHECK(length(TeacherID) = 5),

TeacherName TEXT NOT NULL

)

''')

# Create Course Choosing Table

cursor.execute('''

DROP TABLE IF EXISTS CourseChoosing

CREATE TABLE IF NOT EXISTS CourseChoosing (

StudentID TEXT NOT NULL CHECK(length(StudentID) = 10),

CourseID TEXT NOT NULL CHECK(length(CourseID) = 7),

TeacherID TEXT NOT NULL CHECK(length(TeacherID) = 5),

ChosenYear INTEGER NOT NULL,

Score REAL,

PRIMARY KEY (StudentID, CourseID, TeacherID),

FOREIGN KEY (StudentID) REFERENCES Students(StudentID) ON DELETE CASCADE,

FOREIGN KEY (CourseID) REFERENCES Courses(CourseID),

FOREIGN KEY (TeacherID) REFERENCES Teachers(TeacherID)

)

''')

# Create Account and Password Table

cursor.execute('''

DROP TABLE IF EXISTS AccountPassword

CREATE TABLE IF NOT EXISTS AccountPassword (

Account TEXT PRIMARY KEY,

Occupation TEXT CHECK(Occupation IN ('student', 'teacher', 'admin')),

Password TEXT NOT NULL,

CHECK((Occupation = 'student' AND length(Account) = 10) OR

(Occupation = 'teacher' AND length(Account) = 5) OR

(Occupation = 'admin'))

)

''')

# ------------------------------------- Insert Data --------------------------------------

# Insert Student Data

students = [

('2022000001', 'Alice', 'female', 18, 2022, 'Class 1'),

('2022000002', 'Jack', 'male', 19, 2022, 'Class 1'),

('2022000003', 'Rose', 'female', 18, 2022, 'Class 1'),

('2021000001', 'Bob', 'male', 20, 2021, 'Class 2'),

('2020000001', 'Charlie', 'male', 22, 2020, 'Class 3')

]

cursor.executemany('''

INSERT INTO Students (StudentID, StudentName, Sex, EntranceAge, EntranceYear, Class)

VALUES (?, ?, ?, ?, ?, ?)

''', students)

# Insert Course Data

courses = [

('0000001', 'Mathematical analysis', '00001', 4, 1, None),

('0000002', 'Python Program', '00002', 3, 1, None),

('0000003', 'C++ Program', '00003', 2, 2, 2023)

]

cursor.executemany('''

INSERT INTO Courses (CourseID, CourseName, TeacherID, Credit, Grade, CanceledYear)

VALUES (?, ?, ?, ?, ?, ?)

''', courses)

# Insert Teacher Data

teachers = [

('00001', 'Smith'),

('00002', 'Johnson'),

('00003', 'Williams')

]

cursor.executemany('''

INSERT INTO Teachers (TeacherID, TeacherName)

VALUES (?, ?)

''', teachers)

# Insert Course Choosing Data

course\_choosing = [

('2020000001', '0000001', '00001', 2022, 78.0),

('2020000001', '0000002', '00002', 2021, 100.0),

('2021000001', '0000002', '00002', 2022, 90.0),

('2020000001', '0000003', '00003', 2020, 60.0),

('2021000001', '0000003', '00003', 2021, 99.0),

('2022000001', '0000003', '00003', 2022, 95.0),

('2022000002', '0000003', '00003', 2022, 88.5),

('2022000003', '0000003', '00003', 2022, 78.0)

]

cursor.executemany('''

INSERT INTO CourseChoosing (StudentID, CourseID, TeacherID, ChosenYear, Score)

VALUES (?, ?, ?, ?, ?)

''', course\_choosing)

# Insert Account and Password Data

account\_passwords = [

('2020000001', 'student', '123456'),

('2021000001', 'student', '123456'),

('2022000001', 'student', '123456'),

('2022000002', 'student', '123456'),

('2022000003', 'student', '123456'),

('00001', 'teacher', '123456'),

('00002', 'teacher', '123456'),

('00003', 'teacher', '123456'),

('00000', 'admin', '123456')

]

cursor.executemany('''

INSERT INTO AccountPassword (Account, Occupation, Password)

VALUES (?, ?, ?)

''', account\_passwords)