Student Health Tracking System
Project Report

1. Project Description

1.1 Topic / Application

This project is a web application with SQLite database integration designed to support school health management. The system helps store and analyze student health data across multiple periodic health checkups.

1.2 Objectives

• Manage student information in schools

• Track health checkups over time

• Identify students with abnormal BMI values

• Provide statistics and analysis to support school administration

1.3 Main Features

The application includes the following features:

Student Management

• Add new students

• View student list

• Edit student information

• Delete students

Health Record Management

• Each student can have multiple health checkups

• Add health records (height, weight, check date)

• Edit existing health records

• Delete health records

• View complete health history for each student

Health Analysis

• BMI Analysis: Calculate BMI and detect abnormal cases (Underweight: BMI < 18.5, Overweight: BMI > 25)

• Monthly Statistics: Track number of checkups per month

• Height Comparison: Compare average height by class (based on latest records)

• Weight Comparison: Compare average weight by class (based on latest records)

2. Database Description

2.1 Number of Tables

The database consists of 2 main tables:

1. HocSinh (Students)

2. SucKhoe (Health Records)

2.2 Table: HocSinh (Students)

Stores basic student information.

Column	Data Type	Description
MaHS	INTEGER	Primary key (Student ID, auto-increment)
TenHS	TEXT	Student name
Lop	TEXT	Class
NgaySinh	TEXT	Birth date

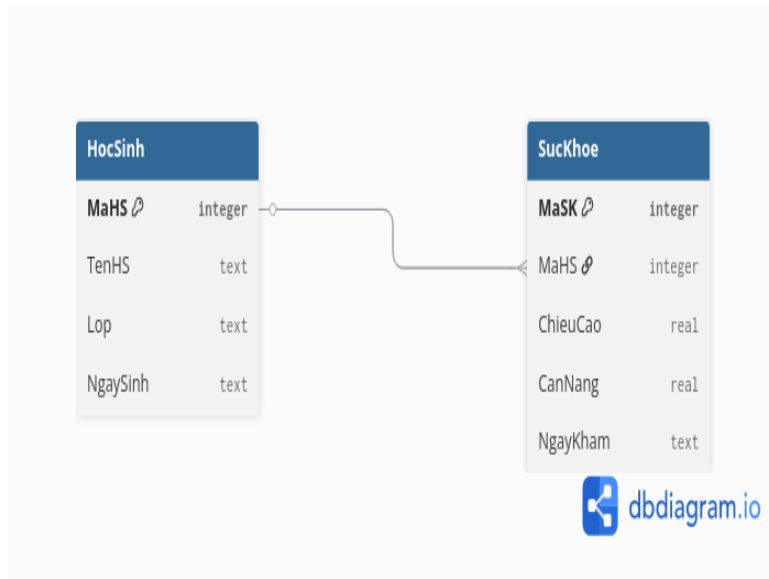**Constraints:** MaHS: PRIMARY KEY, AUTOINCREMENT; TenHS, Lop, NgaySinh: NOT NULL

2.3 Table: SucKhoe (Health Records)

Stores multiple health checkup records for students.

Column	Data Type	Description
MaSK	INTEGER	Primary key (Record ID, auto-increment)
MaHS	INTEGER	Foreign key linking to student
ChieuCao	REAL	Height in meters
CanNang	REAL	Weight in kilograms
NgayKham	TEXT	Checkup date

Constraints: MaSK: PRIMARY KEY, AUTOINCREMENT; MaHS: FOREIGN KEY → HocSinh(MaHS); ChieuCao, CanNang, NgayKham: NOT NULL

2.4 Table Relationships

3. Tools and Frameworks

3.1 Programming Language

• Python (version 3.7+)

3.2 Frameworks and Libraries

Tool / Library	Version	Purpose
Flask	2.x+	Web framework for backend development
SQLite3	Built-in	Embedded database for data storage
Bootstrap	5.3.0	Frontend CSS framework for responsive UI design

Flask: Micro web framework used for route handling, template rendering with Jinja2, request/response processing, and database connection management.

SQLite3: Serverless, file-based SQL database for data persistence, SQL queries for CRUD operations, and complex queries with JOINs and aggregations.

Bootstrap 5: Frontend framework providing responsive layout, pre-styled components (tables, forms, buttons, cards, alerts), navigation bar, and badge styling.

3.3 Python Modules Used

• flask: Web application framework

• sqlite3: Database operations

• render_template: Template rendering

• request: HTTP request handling

• redirect, url_for: Navigation and URL management

4. Application Screenshots

The following screenshots demonstrate the key features of the Student Health Tracking System:

Student List View

Health Records View

BMI Analysis

⚠️ BMI Analysis - Abnormal Cases

BMI Categories:
- Underweight: BMI < 18.5
- Normal: 18.5 ≤ BMI ≤ 25
- Overweight: BMI > 25

☑ Show all abnormal records (default: show only latest record per student)

Student Name	Class	Check Date	Height (m)	Weight (kg)	BMI	Status
Thái Nguyên Trung	11 Tin	2026-01-01	2.00	2.0	0.5	⚠ Underweight

Total abnormal cases: 1

Monthly Statistics

📊 Monthly Health Check Statistics

☑ Show students who were checked each month

Month	Number of Checkups	Students Checked
2026-01	3	Hồ Tuấn Đạt Thái Nguyên Trung Vũ Hạo Thiên

Summary
Total checkups: 3

Months tracked: 1

Height Comparison

📏 Average Height Comparison by Class

Note: Data is calculated based on the latest health record for each student.

Class	Average Height (m)	Number of Students
11 Lý	1.00 m	1 students
11 Tin	1.71 m	2 students

Overall Summary

Total classes: 2

Total students with records: 3

Overall average height: 1.47 m