Student Toolkit

A MINI PROJECT REPORT

Submitted by

KAMALI K A **220701118**

in partial fulfillment for the course

CS19611 – MOBILE APPLICATION DEVELOPMENT LABORATORY

of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI ENGINEERING COLLEGE
RAJALAKSHMI NAGAR
THANDALAM
CHENNAI – 602 105
MAY 2025

RAJALAKSHMI ENGINEERING COLLEGE

CHENNAI - 602105

BONAFIDE CERTIFICATE

Certified that this project report “Student Toolkit” is the Bonafide work of

“ KAMALI K A (220701118) ”

who carried out the project work under my supervision.

Submitted for the Practical Examination held on ______________________

SIGNATURE

Mr. V. KARTHICK
Assistant Professor (SG)
Computer Science and Engineering
Rajalakshmi Engineering College
Thandalam, Chennai-602 105

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ACKNOWLEDGEMENT

I express my sincere thanks to my beloved and honorable chairman **MR. S. MEGANATHAN** and the chairperson **DR.M.THANGAM MEGANATHAN** for their timely support and encouragement.

I am greatly indebted to my respected and honorable principal **Dr. S.N .MURUGESAN** for his able support and guidance. No words of gratitude will suffice for the unquestioning support extended to us by my head of the department **Dr. P. KUMAR**, and my Academic Head **Dr.N.DURAIMURUGAN**, for being ever supporting force during my project work.

I also extend my sincere and hearty thanks to my internal guide **Mr.V.KARTHICK** for his valuable guidance and motivation during the completion of this project.

My sincere thanks to my family members, friends and other staff members of Computer Science and Engineering.

Kamali K A 2116220701118

ABSTRACT

The Student Toolkit is an all-in-one mobile application designed to support academic needs of students by offering a centralized platform for managing essential academic tasks. The app includes tools for calculating CGPA, tracking subject-wise attendance, storing semester-wise subject details, and maintaining personal academic information such as name, roll number, and current semester.

Developed using Android Studio with Kotlin and XML, the application emphasizes simplicity and usability. It employs SQLite for local data persistence, ensuring the app works offline without requiring internet access. The user interface is crafted to be intuitive and responsive, offering a pleasant experience even on low-end devices.

By organizing crucial academic data in one place, Student Toolkit improves time management and reduces the manual effort of maintaining separate notes or spreadsheets. The app is modular, extensible, and can be enhanced with future features like exam reminders, timetable integration, and cloud backup.

TABLE OF CONTENTS

CHAPTER 1

1. INTRODUCTION:

In the fast-evolving academic environment, students are expected to manage multiple responsibilities effectively—ranging from tracking their subject attendance and academic performance to planning their study routines. Traditional methods such as notebooks, spreadsheets, or basic calculators are time-consuming, prone to error, and not well-suited for the mobile-first lifestyle of today's learners. As a result, there is a growing demand for digital solutions that can centralize and streamline essential academic tasks.

The Student Toolkit is an Android-based mobile application developed to address this need. It serves as a personal academic assistant for students, helping them organize and access critical academic information in one place. The application is designed with the student's daily requirements in mind, integrating features such as:

- Student Information Storage: Students can store their name, roll number, semester, and other academic details.

- Subject-wise Attendance Tracker: Allows students to add subjects and mark attendance as present or absent. This helps track overall attendance percentage and identify low-attendance subjects.

- CGPA Calculator: A simple interface for entering subject grades and calculating the Cumulative Grade Point Average (CGPA).

- Semester-wise Subject Manager: Students can add and manage the list of subjects for each semester and use them in attendance or grade tracking.

The app was developed using Android Studio with Kotlin and XML, leveraging a local SQLite database to ensure that all data is stored persistently on the device. No internet connection is required, making the app lightweight and reliable for daily use. The architecture follows the Model-View-ViewModel (MVVM) pattern, which separates the user interface from the business logic and data layer, ensuring better maintainability, scalability, and testability.

The user interface is clean and intuitive, with attention paid to accessibility and ease of navigation. Users can interact with the app through clearly labeled buttons, dialogs, and list views. Special care has been taken to reduce clutter and allow students to focus on their goals without unnecessary distractions.

1.1 IMPLEMENTATION

The application was developed using:

- Kotlin for backend logic.
- XML for user interface layout.
- SQLite for persistent local storage.

The MVVM architecture ensures clean separation of concerns. Users can:

- Add and manage subjects for each semester.
- Track attendance by marking present or absent.
- Calculate CGPA using entered subject grades.
- View stored student details in a structured format.

CHAPTER 2

2. SYSTEM SPECIFICATION

To ensure smooth development, execution, and usability of the **Student Toolkit** application, certain hardware and software configurations are required. The following specifications outline the minimum and recommended system requirements needed to develop and run the application effectively using Android Studio and Jetpack Compose.

2.1 HARDWARE SPECIFICATION

Component	**Minimum Requirement**
Processor	ARMv8 64-bit or x86_64
RAM	2GB (8 GB recommended)
Storage	100MB free space
Display	5" HD (720×1280)

2.2 SOFTWARE SPECIFICATION

Component	**Version/Technology**
Operating System	Android 8.0 (Oreo) or above
Development IDE	Android Studio Giraffe 2022.3.1+
Language	Kotlin 1.8+
SDK Tools	Android SDK 33+
Database	SQLite
Architecture	MVVM with Clean Architecture

CHAPTER 3

Source Code

MainActivity.kt

```
package com.example.studenttoolkit

import android.content.Intent
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity


class MainActivity : AppCompatActivity() {

    // Only keep views that exist in XML
    private lateinit var gradeInputs: List<EditText>
    private lateinit var calculateButton: Button
    private lateinit var resultText: TextView
    private lateinit var attendanceButton: Button
    private lateinit var examCountdownBtn: Button
    private lateinit var addStudentButton: Button
    private lateinit var viewStudentsButton: Button

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        // Initialize only views that exist in XML
        gradeInputs = listOf(
            findViewById(R.id.editTextGrade1),
            findViewById(R.id.editTextGrade2),
            findViewById(R.id.editTextGrade3),
            findViewById(R.id.editTextGrade4),
            findViewById(R.id.editTextGrade5)
        )

        calculateButton = findViewById(R.id.buttonCalculate)
        resultText = findViewById(R.id.textViewResult)
        attendanceButton = findViewById(R.id.attendanceBtn)
        examCountdownBtn = findViewById(R.id.examCountdownBtn)
        addStudentButton = findViewById(R.id.addStudentButton)
        viewStudentsButton = findViewById(R.id.viewStudentsButton)

        // Set click listeners
        calculateButton.setOnClickListener {
            calculateCGPA()
        }

        attendanceButton.setOnClickListener {
            startActivity(Intent(this, AttendanceActivity::class.java))
        }

        examCountdownBtn.setOnClickListener {
            startActivity(Intent(this, ExamCountdownActivity::class.java))
        }

        addStudentButton.setOnClickListener {
            startActivity(Intent(this, AddStudentActivity::class.java))
        }

        viewStudentsButton.setOnClickListener {
            startActivity(Intent(this, ViewStudentsActivity::class.java))
        }
    }

    private fun calculateCGPA() {
        try {
            val grades = gradeInputs.map {
                it.text.toString().takeIf { str -> str.isNotEmpty() }?.toDouble() ?: 0.0
            }
            val cgpa = grades.average()
            resultText.text = "Your CGPA: %.2f".format(cgpa)
        } catch (e: Exception) {
            Toast.makeText(this, "Please enter valid grades",
Toast.LENGTH_SHORT).show()
        }
    }
}
```

CgpaAcitvity.kt:

```
package com.example.studenttoolkit

import android.os.Bundle
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat

class CgpaActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_cgpa)
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main)) { v,
insets ->
            val systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars())
            v.setPadding(systemBars.left, systemBars.top, systemBars.right,
systemBars.bottom)
            insets
        }
    }
}
```

AttendanceAcitivity.kt:

```
package com.example.studenttoolkit

import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity

class AttendanceActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_attendance)

        val subjectName = findViewById<EditText>(R.id.subjectName)
        val totalClasses = findViewById<EditText>(R.id.totalClasses)
        val classesAttended = findViewById<EditText>(R.id.classesAttended)
        val calculateBtn = findViewById<Button>(R.id.calculateBtn)
        val resultText = findViewById<TextView>(R.id.resultText)
        calculateBtn.setOnClickListener {
            val total = totalClasses.text.toString().toIntOrNull()
            val attended = classesAttended.text.toString().toIntOrNull()
            val name = subjectName.text.toString()

            if (total == null || attended == null || name.isBlank()) {
                Toast.makeText(this, "Please enter valid data.",
Toast.LENGTH_SHORT).show()
                return@setOnClickListener
            }

            val percentage = (attended.toDouble() / total) * 100
            val status = if (percentage >= 75) "Safe ✅" else "Short Attendance ⚠️"
            resultText.text = "$name: ${"%.2f".format(percentage)}% - $status"
        }
    }
}
```

ExamCountdownActivity.kt:

```
package com.example.studenttoolkit

import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import java.text.SimpleDateFormat
import java.util.*

class ExamCountdownActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_exam_countdown)

        val examDateInput = findViewById<EditText>(R.id.examDateInput)
        val calculateCountdownBtn =
findViewById<Button>(R.id.calculateCountdownBtn)
        val countdownResult = findViewById<TextView>(R.id.countdownResult)
        calculateCountdownBtn.setOnClickListener {
            val inputDateStr = examDateInput.text.toString()
            val sdf = SimpleDateFormat("yyyy-MM-dd", Locale.US)

            try {
                val examDate = sdf.parse(inputDateStr)
                val today = Calendar.getInstance().time

                val diffInMillis = examDate.time - today.time
                val daysLeft = (diffInMillis / (1000 * 60 * 60 * 24)).toInt()

                if (daysLeft >= 0) {
                    countdownResult.text = "Days until exam: $daysLeft"
                } else {
                    countdownResult.text = "Exam date has already passed!"
                }
            } catch (e: Exception) {
                Toast.makeText(this, "Invalid date format!",
Toast.LENGTH_SHORT).show()
            }
        }
    }
}
```

AddStudentActivity.kt:

```
package com.example.studenttoolkit

import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity

class AddStudentActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_add_student)

        val nameInput = findViewById<EditText>(R.id.nameInput)
        val rollInput = findViewById<EditText>(R.id.rollInput)
        val semesterInput = findViewById<EditText>(R.id.semesterInput)
        val subjectInput = findViewById<EditText>(R.id.subjectInput)
        val cgpaInput = findViewById<EditText>(R.id.cgpaInput)
        val attendanceInput = findViewById<EditText>(R.id.attendanceInput)
        val saveButton = findViewById<Button>(R.id.saveButton)

        val db = DBHelper(this)

        saveButton.setOnClickListener {
            val name = nameInput.text.toString()
            val roll = rollInput.text.toString()
            val semester = semesterInput.text.toString()
            val subjects = subjectInput.text.toString()
            val cgpa = cgpaInput.text.toString().toDoubleOrNull() ?: 0.0
            val attendance = attendanceInput.text.toString().toDoubleOrNull() ?:0.0

            if (db.addStudent(name, roll, semester, subjects, cgpa, attendance)) {
                Toast.makeText(this, "Student Added", Toast.LENGTH_SHORT).show()
                finish()
            } else {
                Toast.makeText(this, "Failed to Add", Toast.LENGTH_SHORT).show()
            }
        }
    }
}
```

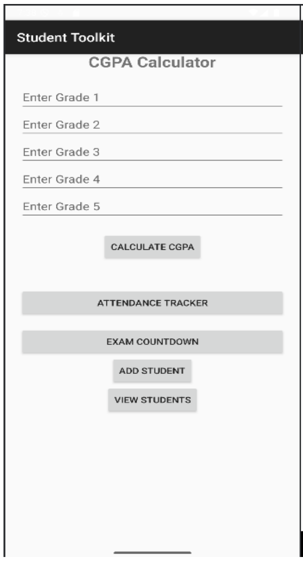
ViewStudentsAcitivity:

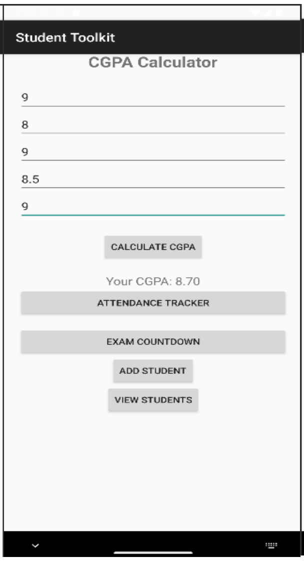
```
package com.example.studenttoolkit

import android.os.Bundle
import android.widget.ArrayAdapter
import android.widget.ListView
import androidx.appcompat.app.AppCompatActivity

class ViewStudentsActivity : AppCompatActivity() {
    private lateinit var dbHelper: DBHelper
    private lateinit var listView: ListView
    private lateinit var studentAdapter: ArrayAdapter<String>
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_view_students)

        dbHelper = DBHelper(this)
        listView = findViewById(R.id.studentListView)

        val students = dbHelper.getAllStudents() // Get students from DB
        val studentList = students.map {
            "Name: ${it.name}\nRoll: ${it.rollNumber}\nSemester:
```

```
${it.semester}\nSubjects: ${it.subject}\nCGPA: ${it.cgpa}\nAttendance: 
${it.attendance}"
        }

        val adapter = ArrayAdapter(this, android.R.layout.simple_list_item_1, 
studentList)
        listView.adapter = adapter
    }
}
```

CHAPTER 4

SNAP SHOTS





9

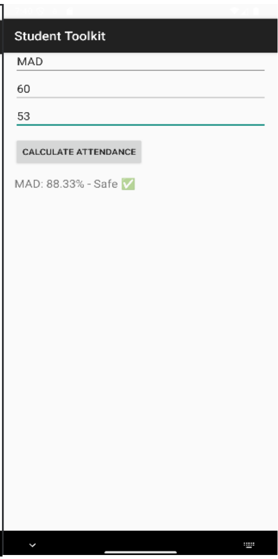
8

9

8.5

9

Your CGPA: 8.70

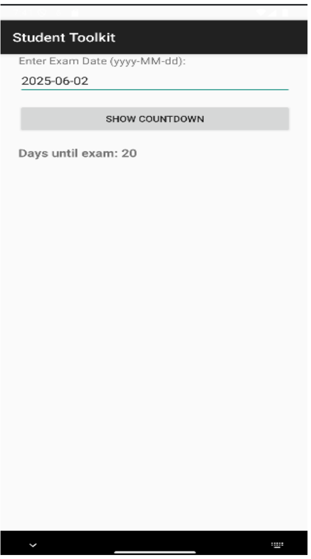


MAD

60

53

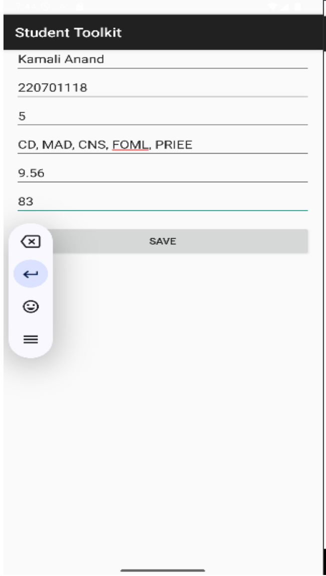
MAD: 88.33% - Safe ✅



Enter Exam Date (yyyy-MM-dd):

2025-06-02

Days until exam: 20



Kamali Anand

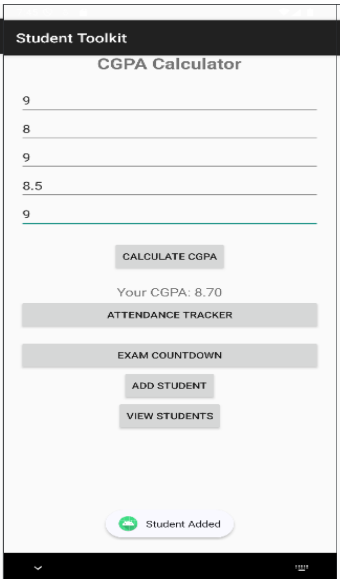
220701118

5

CD, MAD, CNS, FOML, PRIEE

9.56

83



9

8

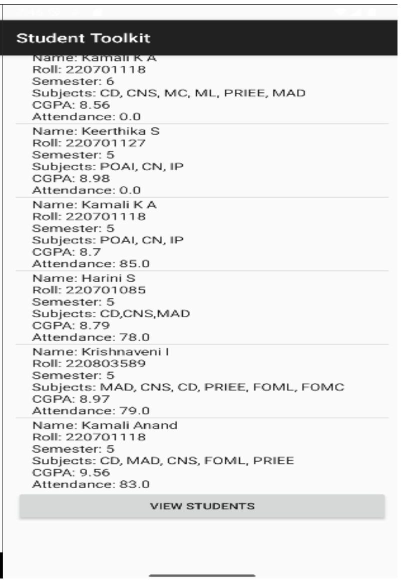
9

8.5

9

Your CGPA: 8.70

Student Added



Name: Kamali K A
Roll: 220701118
Semester: 6
Subjects: CD, CNS, MC, ML, PRIEE, MAD
CGPA: 8.56
Attendance: 0.0

Name: Keerthika S
Roll: 220701127
Semester: 5
Subjects: POAI, CN, IP
CGPA: 8.98
Attendance: 0.0

Name: Kamali K A
Roll: 220701118
Semester: 5
Subjects: POAI, CN, IP
CGPA: 8.7
Attendance: 85.0

Name: Harini S
Roll: 220701085
Semester: 5
Subjects: CD,CNS,MAD
CGPA: 8.79
Attendance: 78.0

Name: Krishnaveni I
Roll: 220803589
Semester: 5
Subjects: MAD, CNS, CD, PRIEE, FOML, FOMC
CGPA: 8.97
Attendance: 79.0

Name: Kamali Anand
Roll: 220701118
Semester: 5
Subjects: CD, MAD, CNS, FOML, PRIEE
CGPA: 9.56
Attendance: 83.0

CHAPTER 5

CONCLUSION

The Student Toolkit project was undertaken with the goal of simplifying and centralizing key academic tasks for students through a single, efficient mobile application. Over the course of its development, the project successfully translated practical student needs—such as tracking attendance, managing subjects, and calculating CGPA—into functional modules that work cohesively within a user-friendly Android interface.

The application empowers students to:

- Digitally maintain academic information like name, roll number, and semester.
- Add and manage subjects for each semester.
- Monitor their attendance through an intuitive tracker that calculates attendance percentages.
- Calculate CGPA quickly and accurately using a simple input-driven interface.

By utilizing Android Studio with Kotlin and XML, and employing SQLite as the local database, the project ensures both performance and data persistence. The adoption of the MVVM architecture brought structure to the codebase, improving maintainability and enabling a smooth separation between UI and logic.