

Practical: 11

AIM: Create Note Android Application that can add Note, edit Note, delete Note, and set reminder date & time of note. By using Broadcast Receiver, AlarmManager set reminder of note. By using SQLite, store all notes data.

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activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.coordinatorlayout.widget.CoordinatorLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <com.google.android.material.appbar.AppBarLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:fitsSystemWindows="true">

        <com.google.android.material.appbar.MaterialToolbar
            android:id="@+id/toolbar"
            android:layout_width="match_parent"
            android:layout_height="?attr/actionBarSize"
            app:layout_scrollFlags="scroll|enterAlways|snap"
            app:title="MADPracrical11"/>
    </com.google.android.material.appbar.AppBarLayout>

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginBottom="?attr/actionBarSize"
        app:layout_behavior="@string/appbar_scrolling_view_behavior">

        <androidx.recyclerview.widget.RecyclerView
            android:id="@+id/listView1"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            app:layoutManager="androidx.recyclerview.widget.LinearLayoutManager"
            tools:itemCount="5"
            tools:listitem="@layout/note_item_view" />

    </androidx.constraintlayout.widget.ConstraintLayout>
    <com.google.android.material.floatingactionbutton.FloatingActionButton
        android:id="@+id/fab"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="bottom|end"
        android:layout_marginEnd="16dp"
        android:layout_marginBottom="56dp"
        app:srcCompat="@android:drawable/ic_input_add" />
</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

activity_note_view.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.coordinatorlayout.widget.CoordinatorLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".NoteViewActivity">

    <com.google.android.material.appbar.AppBarLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:fitsSystemWindows="true">

        <com.google.android.material.appbar.MaterialToolbar
            android:id="@+id/toolbar"
            android:layout_width="match_parent"
            android:layout_height="?attr/actionBarSize"
            app:layout_scrollFlags="scroll|enterAlways|snap" />
    </com.google.android.material.appbar.AppBarLayout>

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginBottom="?attr/actionBarSize"
        app:layout_behavior="@string/appbar_scrolling_view_behavior">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical"
            android:padding="16dp">

            <TextView
                android:id="@+id/note_title"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:ellipsize="end"
                android:gravity="center_vertical"
                android:textAppearance="@style/TextAppearance.AppCompat"
                android:textSize="20sp"
                android:textStyle="bold"
                tools:text="This is Note Title but some time it is bigger than think." />

            <TextView
                android:id="@+id/note_subtitle"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:ellipsize="end"
                android:gravity="center_vertical"
                android:textSize="16sp"
                tools:text="SubTitle (optional)" />

        </LinearLayout>

    </androidx.constraintlayout.widget.ConstraintLayout>

</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

```
<TextView
    android:id="@+id/note_content"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="8dp"
    android:layout_marginBottom="8dp"
    android:autoLink="all"
    android:ellipsize="end"
    android:textAppearance="@style/TextAppearance.AppCompat"
    android:textSize="18sp"
    tools:text="Description" />
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <TextView
        android:layout_gravity="center_vertical"
        android:id="@+id/note_date"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        tools:text="Date and time" />

</LinearLayout>

<TextView
    android:layout_gravity="center_vertical"
    android:id="@+id/note_reminder_date_time"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    tools:text="Reminder Date and time" />

</LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

note_edit_view.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    >
    <androidx.core.widget.NestedScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:layout_marginHorizontal="20dp"
        android:layout_marginVertical="20dp">
        <androidx.constraintlayout.widget.ConstraintLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content">
            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/textInputLayout2"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toTopOf="parent">

                <com.google.android.material.textfield.TextInputEditText
                    android:id="@+id/note_title"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:drawableTint="?attr/colorPrimary"
                    android:drawableEnd="@drawable/ic_baseline_event_note_24"
                    android:hint="Note Title" />
            </com.google.android.material.textfield.TextInputLayout>

            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/textInputLayout4"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toBottomOf="@+id/textInputLayout2">

                <com.google.android.material.textfield.TextInputEditText
                    android:id="@+id/note_subTitle"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:drawableTint="?attr/colorPrimary"
                    android:drawableEnd="@drawable/ic_baseline_event_note_24"
                    android:hint="Note Sub Title" />
            </com.google.android.material.textfield.TextInputLayout>

            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/textInputLayout3"
                android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textInputLayout4">

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/note_description"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:drawableEnd="@drawable/ic_baseline_event_note_24"
            android:gravity="top"
            android:drawableTint="?attr/colorPrimary"
            android:hint="Note Description"
            android:minLines="5" />
    </com.google.android.material.textfield.TextInputLayout>
    <LinearLayout
        android:orientation="horizontal"
        android:id="@+id/layoutReminder"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textInputLayout3">
        <TextView
            android:visibility="gone"
            android:text="Reminder:"
            android:textSize="30sp"
            android:textStyle="bold"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"/>

        <com.google.android.material.switchmaterial.SwitchMaterial
            android:id="@+id/reminderSwitch"
            android:layout_width="0dp"
            android:gravity="end|center_vertical"
            android:textSize="20sp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Set Reminder" />

    </LinearLayout>
    <TimePicker
        android:id="@+id/reminderTime"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/layoutReminder" />
</androidx.constraintlayout.widget.ConstraintLayout>
</androidx.core.widget.NestedScrollView>
</androidx.constraintlayout.widget.ConstraintLayout>
```

note_item_view.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools">
    <com.google.android.material.card.MaterialCardView
        android:id="@+id/card_note"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginVertical="10dp"
        android:layout_marginHorizontal="20dp"
        style="?attr/materialCardViewElevatedStyle"
        app:cardElevation="10dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:layout_marginBottom="30dp"
        app:layout_constraintBottom_toBottomOf="parent"
    >
        <LinearLayout
            android:orientation="horizontal"
            android:layout_width="match_parent"
            android:layout_height="wrap_content">
            <LinearLayout
                android:layout_weight="0.9"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:orientation="vertical"
                android:padding="16dp">

                <TextView
                    android:id="@+id/note_title"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:ellipsize="end"
                    android:gravity="center_vertical"
                    android:textAppearance="@style/TextAppearance.AppCompat"
                    android:textSize="20sp"
                    android:textStyle="bold"
                    android:maxLines="1"
                    tools:text="This is Note Title but
                    some time it is bigger than think." />

                <TextView
                    android:id="@+id/note_subtitle"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:ellipsize="end"
                    android:gravity="center_vertical"
                    android:maxLines="1"
                    android:textSize="16sp"
                    tools:text="SubTitle" />
            </LinearLayout>
        </LinearLayout>
    </com.google.android.material.card.MaterialCardView>
</androidx.constraintlayout.widget.ConstraintLayout>
```

```
<TextView
    android:visibility="gone"
    android:id="@+id/note_content"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="8dp"
    android:layout_marginBottom="8dp"
    android:autoLink="all"
    android:ellipsize="end"
    android:maxLines="4"
    android:textAppearance="@style/TextAppearance.AppCompat"
    android:textSize="18sp"
    tools:text="Description" />
<TextView
    android:visibility="gone"
    android:layout_gravity="center_vertical"
    android:id="@+id/note_date"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    tools:text="modified Date and time" />
<TextView
    android:layout_gravity="center_vertical"
    android:id="@+id/note_reminder_date_time"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textColor="#FF3355"
    android:textStyle="bold"
    tools:text="Reminder Date and time" />
</LinearLayout>
<LinearLayout
    android:layout_gravity="center_vertical"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <ImageView
        android:id="@+id/imgEdit"
        android:padding="10dp"
        android:layout_marginEnd="10dp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/ic_baseline_edit_24"
        app:tint="@color/dark_green" />
    <ImageView
        android:layout_marginEnd="10dp"
        android:id="@+id/imgDelete"
        android:padding="10dp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/ic_baseline_delete_24"
        app:tint="#FF2244" />
    </LinearLayout>
</LinearLayout>
</com.google.android.material.card.MaterialCardView>
</androidx.constraintlayout.widget.ConstraintLayout>
```


AlarmBroadcastReceiver.kt

```
package com.example.madpractical11_21012022022

import android.app.Notification
import android.app.NotificationChannel
import android.app.NotificationManager
import android.app.PendingIntent
import android.content.BroadcastReceiver
import android.content.Context
import android.content.Intent
import android.graphics.Color
import android.os.Build
import android.util.Log
import androidx.core.app.NotificationCompat
import java.io.Serializableizable

class AlarmBroadcastReceiver : BroadcastReceiver() {
    val TAG = "AlarmBroadcastReceiver"
    override fun onReceive(context: Context, intent: Intent) {
        if(intent != null && context!=null) {
            val note = Note()
            note.id = intent.getIntExtra(Note.NOTE_ID_KEY, -1)
            note.title = intent.getStringExtra(Note.NOTE_TITLE_KEY)!!
            note.subTitle = intent.getStringExtra(Note.NOTE_SUBTITLE_KEY)!!
            note.Description = intent.getStringExtra(Note.NOTE_DESCRIPTION_KEY)!!
            note.modifiedTime = intent.getStringExtra(Note.NOTE_MODIFIED_TIME_KEY)!!
            note.remindertime = intent.getLongExtra(Note.NOTE_REMINDER_TIME_KEY, 0)
            note.isReminder = true
            Log.i(TAG, "onReceive: Note: $note")
            notificationDialog(
                context,
                NoteViewActivity::class.java,
                note.title,
                note.Description,
                note
            )
        }
    }
    private fun notificationDialog(context: Context, cls: Class<*>,
    title: String, descr: String,note: Note) {
        val notificationManager = context.getSystemService(Context.NOTIFICATION_SERVICE)
        as NotificationManager
        val NOTIFICATION_CHANNEL_ID = "hitensadani"
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            val notificationChannel = NotificationChannel(
                NOTIFICATION_CHANNEL_ID,
                "Note Application", NotificationManager.IMPORTANCE_HIGH
            )
            // Configure the notification channel.
            notificationChannel.description = "Note Application description"
            notificationChannel.enableLights(true)
            notificationChannel.lightColor = Color.RED
            notificationChannel.vibrationPattern = longArrayOf(0, 1000, 500, 1000)
            notificationChannel.enableVibration(true)
        }
    }
}
```

```
        notificationManager.createNotificationChannel(notificationChannel)
    }
    val notificationIntent = Intent(context, cls)
    notificationIntent.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP)
    //notification message will get at NotificationView
    notificationIntent.putExtra("message", "This is a notification message")
    notificationIntent.putExtra("Object", note as Serializable)
    val pendingIntent = PendingIntent.getActivity(
        context, Note.REMINDER_REQUEST_CODE, notificationIntent,
        PendingIntent.FLAG_UPDATE_CURRENT
    )
    val notificationBuilder = NotificationCompat.Builder(context,
        NOTIFICATION_CHANNEL_ID)
    notificationBuilder.setAutoCancel(true)
        .setDefaults(Notification.DEFAULT_ALL)
        .setWhen(System.currentTimeMillis())
        .setSmallIcon(R.mipmap.ic_launcher)
        .setTicker("NoteApplication-HitenSadani")
        //.setPriority(Notification.PRIORITY_MAX)
        .setContentTitle(title)
        .setContentText(descr)
        .setContentInfo(descr + "Information")
        .setAutoCancel(true)
        .setContentIntent(pendingIntent)
    notificationManager.notify(1, notificationBuilder.build())
}
}
```

DatabaseHelper.kt

```
package com.example.madpractical11_21012022022

import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper
import java.util.ArrayList

class DatabaseHelper(context: Context?) :
    SQLiteOpenHelper(context, DATABASE_NAME, null, DATABASE_VERSION) {
    companion object {
        // Database Version
        private const val DATABASE_VERSION = 1
        // Database Name
        private const val DATABASE_NAME = "notes_db"
    }
    // Creating Tables
    override fun onCreate(db: SQLiteDatabase) {
        // create notes table
        db.execSQL(NotesData.CREATE_TABLE)
    }
    // Upgrading database
    override fun onUpgrade(db: SQLiteDatabase, oldVersion: Int, newVersion: Int) {
        // Drop older table if existed
        db.execSQL("DROP TABLE IF EXISTS " + NotesData.TABLE_NAME)
        // Create tables again
        onCreate(db)
    }
    fun insertNote(note: Note): Long {
        // get writable database as we want to write data
        val db = this.writableDatabase
        // insert row
        val id = db.insert(NotesData.TABLE_NAME, null, getValues(note))
        // close db connection
        db.close()
        // return newly inserted row id
        return id
    }
    private fun getValues(note: Note): ContentValues {
        val values = ContentValues()
        // `id` will be inserted automatically.
        // no need to add them
        values.put(NotesData.COLUMN_NOTE_TITLE, note.title)
        values.put(NotesData.COLUMN_NOTE_SUB_TITLE, note.subTitle)
        values.put(NotesData.COLUMN_NOTE_DESCRIPTION, note.Description)
        values.put(NotesData.COLUMN_NOTE_REMINDER_TIME, note.remindertime)
        values.put(NotesData.COLUMN_NOTE_SET_REMINDER, note.isReminder)
        values.put(NotesData.COLUMN_TIMESTAMP, note.modifiedTime)
        return values
    }
    fun getNote(id: Long): Note {
        // get readable database as we are not inserting anything
```

```
val db = this.readableDatabase
val cursor = db.query(
    NotesData.TABLE_NAME,
    arrayOf(NotesData.COLUMN_ID,
        NotesData.COLUMN_NOTE_TITLE,
        NotesData.COLUMN_NOTE_SUB_TITLE,
        NotesData.COLUMN_NOTE_DESCRIPTION,
        NotesData.COLUMN_NOTE_SET_REMINDER,
        NotesData.COLUMN_NOTE_REMINDER_TIME,
        NotesData.COLUMN_TIMESTAMP),
    NotesData.COLUMN_ID.toString() + "=?",
    arrayOf(id.toString()),
    null,
    null,
    null,
    null
)
cursor?.moveToFirst()
val note = getNote(cursor)

// close the db connection
cursor!!.close()
return note
}
private fun getNote(cursor: Cursor): Note
{
    // prepare note object
    val note = Note(
        cursor.getString(cursor.getColumnIndexOrThrow(NotesData.COLUMN_NOTE_TITLE)),
        cursor.getString(cursor.getColumnIndexOrThrow(NotesData.COLUMN_NOTE_SUB_TITLE)),
        cursor.getString(
            cursor.getColumnIndexOrThrow(NotesData.COLUMN_NOTE_DESCRIPTION)),
        cursor.getString(cursor.getColumnIndexOrThrow(NotesData.COLUMN_TIMESTAMP))
    )
    note.isReminder = (cursor.getInt(
        cursor.getColumnIndexOrThrow(NotesData.COLUMN_NOTE_SET_REMINDER))==1)
    note.remindertime =
        cursor.getLong(cursor.getColumnIndexOrThrow(NotesData.COLUMN_NOTE_REMINDER_TIME))
    note.id = cursor.getInt(cursor.getColumnIndexOrThrow(NotesData.COLUMN_ID))
    return note
}
// Select All Query
val allNotes: ArrayList<Note>
get() {
    val notes = ArrayList<Note>()
    // Select All Query
    val selectQuery = "SELECT * FROM " +
        NotesData.TABLE_NAME.toString() + " ORDER BY " +
        NotesData.COLUMN_TIMESTAMP.toString() + " DESC"
    val db = this.writableDatabase
    val cursor = db.rawQuery(selectQuery, null)
    // looping through all rows and adding to list
    if (cursor.moveToFirst()) {
```

```
        do {
            notes.add(getNote(cursor))
        } while (cursor.moveToNext())
    }
    // close db connection
    db.close()
    // return notes list
    return notes
}

val notesCount: Int
get() {
    val countQuery = "SELECT * FROM " + NotesData.TABLE_NAME
    val db = this.readableDatabase
    val cursor = db.rawQuery(countQuery, null)
    val count = cursor.count
    cursor.close()
    // return count
    return count
}

fun updateNote(note: Note): Int {
    val db = this.writableDatabase
    // updating row
    return db.update(
        NotesData.TABLE_NAME,
        getValues(note),
        NotesData.COLUMN_ID + " = ?",
        arrayOf(note.id.toString())
    )
}

fun deleteNote(note: Note) {
    val db = this.writableDatabase
    db.delete(
        NotesData.TABLE_NAME,
        NotesData.COLUMN_ID + " = ?",
        arrayOf(note.id.toString())
    )
    db.close()
}
}
```

MainActivity.kt

```
package com.example.madpractical11_21012022022

import android.os.Build
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.util.Log
import android.view.LayoutInflater
import android.widget.Toast
import androidx.appcompat.app.AlertDialog
import androidx.core.view.WindowCompat
import androidx.recyclerview.widget.DefaultItemAnimator
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView
import com.example.madpractical11_21012022022.databinding.ActivityMainBinding
import com.example.madpractical11_21012022022.databinding.NoteEditViewBinding

import java.util.ArrayList

class MainActivity : AppCompatActivity() {
    private lateinit var binding: ActivityMainBinding
    private val TAG = "MainActivity"
    private var listener: ((note: Note, baseListAdapter: NotesAdapter,
mode: NoteMode, position: Int)->Unit)? =
        { note: Note, _: NotesAdapter, noteMode: NoteMode, pos: Int ->
            note.modifiedTime = Note.getCurrentDateTime()
            if (noteMode == NoteMode.add) {
                if (!createNote(note))
                    Toast.makeText(this, "Enter Valid Note", Toast.LENGTH_SHORT).show()
            } else if (noteMode == NoteMode.edit) {
                Log.i(TAG, "listener: Note:$note")
                if (!updateNote(note, pos))
                    Toast.makeText(this, "Enter Valid Note", Toast.LENGTH_SHORT).show()
            }
        }

    lateinit var db: DatabaseHelper
    private val notesList: ArrayList<Note> = ArrayList<Note>()
    lateinit var notesRecycleAdapter: NotesAdapter
    override fun onCreate(savedInstanceState: Bundle?) {
        WindowCompat.setDecorFitsSystemWindows(window, false)
        super.onCreate(savedInstanceState)
        binding = ActivityMainBinding.inflate(layoutInflater)
        setContentView(binding.root)
        db = DatabaseHelper(this)
        notesList.addAll(db.allNotes)
        notesRecycleAdapter = NotesAdapter(this, notesList)
        val layoutManager: RecyclerView.LayoutManager =
            LinearLayoutManager(applicationContext)
        binding.listView1.layoutManager = layoutManager
        binding.listView1.itemAnimator = DefaultItemAnimator()
        binding.listView1.setHasFixedSize(true)
        binding.listView1.adapter = notesRecycleAdapter
        setSupportActionBar(binding.toolbar)
        binding.fab.setOnClickListener {
```

```
        showAlertDialog(
            NoteMode.add, "Add Note",
            Note("", "", "", Note.getCurrentDateTime()), -1, notesRecycleAdapter
        )
    }
}
/**
 * Inserting new note in db
 * and refreshing the list
 */
private fun createNote(note: Note): Boolean {
    if(!note.isValid())
        return false
    // inserting note in db and getting
    // newly inserted note id
    val id = db.insertNote(note)

    // get the newly inserted note from db
    val n: Note = db.getNote(id)
    // adding new note to array list at 0 position
    notesList.add(0, n)

    // refreshing the list
    notesRecycleAdapter.notifyItemInserted(0)
    note.saveNote(this)
    return true
}

/**
 * Updating note in db and updating
 * item in the list by its position
 */
private fun updateNote(note: Note, position: Int): Boolean {
    if(!note.isValid())
        return false
    val n: Note = notesList[position]
    n.changeValue(note)
    Log.i(TAG, "updateNote: note:: $n")
    // updating note in db
    db.updateNote(n)

    // refreshing the list
    notesList[position] = n
    notesRecycleAdapter.notifyItemChanged(position)
    note.saveNote(this)
    return true
}

/**
 * Deleting note from SQLite and removing the
 * item from the list by its position
 */
fun deleteNote(position: Int) {
    // deleting the note from db
    db.deleteNote(notesList[position])
}
```

```
// removing the note from the list
notesList.removeAt(position)
notesRecycleAdapter.notifyItemRemoved(position)
}
fun showAlertDialog(
    mode: NoteMode,
    dialogTitle: String,
    note: Note,
    position: Int,
    baseListAdapter: NotesAdapter
) {
    val builder: AlertDialog.Builder = AlertDialog.Builder(this)
    builder.setTitle(dialogTitle)
    // set the custom layout
    val binding = NoteEditViewBinding.inflate(LayoutInflater.from(this))
    binding.noteTitle.setText(note.title)
    binding.noteSubTitle.setText(note.subTitle)
    binding.noteDescription.setText(note.Description)
    binding.reminderSwitch.isChecked = note.isReminder
    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {
        binding.reminderTime.hour = note.getHour()
        binding.reminderTime.minute = note.getMinute()
    }
    else{
        binding.reminderTime.currentHour = note.getHour()
        binding.reminderTime.currentMinute = note.getMinute()
    }

    builder.setView(binding.root)
    // add a button
    builder.setPositiveButton(
        "OK"
    ) { _, _ ->
        val newNote = Note(note)
        newNote.title = binding.noteTitle.text.toString()
        newNote.subTitle = binding.noteSubTitle.text.toString()
        newNote.Description = binding.noteDescription.text.toString()
        newNote.isReminder = binding.reminderSwitch.isChecked

        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.M)
            newNote.remindertime = Note.getMillis
                (binding.reminderTime.hour, binding.reminderTime.minute)
        else
            newNote.remindertime = Note.getMillis
                (binding.reminderTime.currentHour, binding.reminderTime.currentMinute)
        Log.i(TAG, "showAlertDialog: OK Button:: Note:$newNote")
        listener?.invoke(newNote, baseListAdapter, mode, position)
    }
    // create and show the alert dialog
    val dialog: AlertDialog = builder.create()
    dialog.show()
}
}
```


Note.kt

```
package com.example.madpractical11_21012022022

import android.app.AlarmManager
import android.app.PendingIntent
import android.content.Context
import android.content.Context.ALARM_SERVICE
import android.content.Intent
import java.io.Serializable
import java.text.DateFormat
import java.text.SimpleDateFormat
import java.util.*

enum class NoteMode{
    edit,
    add
}

class Note(var title:String, var subTitle:String, var Description:String, var
modifiedTime:String, var isReminder: Boolean = false):Serializable
{
    var remindertime:Long = System.currentTimeMillis()
    var id = noteIdGeneration()
    set(value) {
        field = value
        if(idNote < value)
            idNote = value
    }

    constructor():this("", "", "", "")
    { }
    constructor(note: Note) :
    this(note.title,note.subTitle,note.Description,note.modifiedTime,note.isReminder) {
        remindertime = note.remindertime
    }

    fun isValid() :Boolean{
        if(title.isEmpty() || Description.isEmpty())
            return false
        return true
    }
    fun changeValue(newValue: Note)
    {
        title = newValue.title
        subTitle = newValue.subTitle
        Description = newValue.Description
        modifiedTime = newValue.modifiedTime
        isReminder = newValue.isReminder
        remindertime = newValue.remindertime
    }
    fun getReminderText() :String
    {
        return "Reminder: "+(SimpleDateFormat("MMM, dd yyyy hh:mm a") as DateFormat).format(
            Date(remindertime)
        )
    }
}
```

```
fun saveNote(context: Context)
{
    if(isReminder)
    {
        setReminder(context,this)
    }
}

fun getHour():Int{
    val cal = Calendar.getInstance()
    cal.time = Date(remindertime)
    return cal[Calendar.HOUR_OF_DAY]
}

fun getMinute():Int{
    val cal = Calendar.getInstance()
    cal.time = Date(remindertime)
    return cal[Calendar.MINUTE]
}

fun calcReminder()
{
    if(remindertime < System.currentTimeMillis())
        isReminder = false
}

override fun toString(): String {
    return "$id\n"+title +"\n"+subTitle +"\n"+Description+"\nReminder:$isReminder"
    +"\n"+getReminderText()
}

companion object {
    var idNote = 0
    fun noteIdGeneration():Int
    {
        idNote++
        return idNote
    }
    val REMINDER_REQUEST_CODE = 1000
    val NOTE_ID_KEY = "Id"
    val NOTE_TITLE_KEY = "Title"
    val NOTE_SUBTITLE_KEY = "SubTitle"
    val NOTE_DESCRIPTION_KEY = "Description"
    val NOTE_MODIFIED_TIME_KEY = "ModifiedTime"
    val NOTE_REMINDER_TIME_KEY = "ReminderTime"

    fun getCurrentDateTime(): String {
        val cal = Calendar.getInstance()
        val df: DateFormat = SimpleDateFormat("MMM, dd yyyy hh:mm:ss a")
        return df.format(cal.time)
    }
    fun getMillis(hour:Int,min:Int):Long
    {
        val setcalendar = Calendar.getInstance()
        setcalendar[Calendar.HOUR_OF_DAY] = hour
        setcalendar[Calendar.MINUTE] = min
        setcalendar[Calendar.SECOND] = 0
    }
}
```

```
        return setcalendar.timeInMillis
    }

    fun setReminder(context: Context, note: Note) {
        val intent = Intent(context, AlarmBroadcastReceiver::class.java)
        intent.putExtra(NOTE_ID_KEY, note.id)
        intent.putExtra(NOTE_TITLE_KEY, note.title)
        intent.putExtra(NOTE_SUBTITLE_KEY, note.subTitle)
        intent.putExtra(NOTE_DESCRIPTION_KEY, note.Description)
        intent.putExtra(NOTE_MODIFIED_TIME_KEY, note.modifiedTime)
        intent.putExtra(NOTE_REMINDER_TIME_KEY, note.remindertime)

        val pendingIntent =
            PendingIntent.getBroadcast(context, note.id, intent,
                PendingIntent.FLAG_CANCEL_CURRENT)
        val alarmManager = context.getSystemService(ALARM_SERVICE) as AlarmManager

        if(note.isReminder) {
            alarmManager.setExact(
                AlarmManager.RTC_WAKEUP,
                note.remindertime,
                pendingIntent
            )
        }
        else
            alarmManager.cancel(pendingIntent)
    }
}
```

NotesAdapter.kt

```
package com.example.madpractical11_21012022022

import android.content.Context
import android.content.Intent
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import androidx.recyclerview.widget.RecyclerView
import com.example.madpractical11_21012022022.databinding.NoteItemViewBinding
import java.io.Serializable

class NotesAdapter (private val context: Context, private val array:ArrayList<Note>):
    RecyclerView.Adapter<NotesAdapter.NotesViewHolder>() {
    inner class NotesViewHolder(val binding: NoteItemViewBinding):
        RecyclerView.ViewHolder(binding.root)

    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): NotesViewHolder {
        val binding = NoteItemViewBinding.inflate(LayoutInflater.from(parent.context),
            parent, false)
        return NotesViewHolder(binding)
    }

    override fun onBindViewHolder(holder: NotesViewHolder, position: Int) {
        with(holder){
            with(array[position]){
                binding.noteTitle.text = this.title
                binding.noteSubtitle.text = this.subTitle
                binding.noteContent.text = this.Description
                binding.noteDate.text = this.modifiedTime
                val obj = this as Serializable
                this.calcReminder()
                if(this.isReminder)
                {
                    binding.noteReminderDateTime.visibility = View.VISIBLE
                    binding.noteReminderDateTime.text = this.getReminderText()
                }
                else
                    binding.noteReminderDateTime.visibility = View.GONE
                binding.imgDelete.setOnClickListener{
                    (context as MainActivity).deleteNote(position)
                }
                binding.cardNote.setOnClickListener {
                    Intent(this@NotesAdapter.context, NoteViewActivity::class.java).apply {
                        putExtra("Object",obj)
                        this@NotesAdapter.context.startActivity(this)
                    }
                }
                binding.imgEdit.setOnClickListener {
                    (context as MainActivity).showAlertDialog(
                        NoteMode.edit,
                        "Edit Note",
                        this,
                        position,

```

```
        this@NotesAdapter
    )
    }
}
}
}
}
override fun getItemCount(): Int {
    return array.size
}
}
```

NotesData.kt

```
package com.example.madpractical11_21012022022

class NotesData {
    companion object{
        const val TABLE_NAME = "notes"

        const val COLUMN_ID = "id"
        const val COLUMN_NOTE_TITLE = "note_title"
        const val COLUMN_NOTE_SUB_TITLE = "note_sub_title"
        const val COLUMN_NOTE_DESCRIPTION = "note_description"
        const val COLUMN_NOTE_SET_REMINDER = "note_set_reminder"
        const val COLUMN_NOTE_REMINDER_TIME = "note_set_reminder_time"
        const val COLUMN_TIMESTAMP = "note_modified_timestamp"

        // Create table SQL query
        val CREATE_TABLE = ("CREATE TABLE " + TABLE_NAME + "("
            + COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT,"
            + COLUMN_NOTE_TITLE + " TEXT,"
            + COLUMN_NOTE_SUB_TITLE + " TEXT,"
            + COLUMN_NOTE_DESCRIPTION + " TEXT,"
            + COLUMN_NOTE_SET_REMINDER + " INTEGER,"
            + COLUMN_NOTE_REMINDER_TIME + " INTEGER,"
            + COLUMN_TIMESTAMP + " TEXT"
            + ")")
    }
}
```

NoteViewActivity.kt

```
package com.example.madpractical11_21012022022

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.view.View
import com.example.madpractical11_21012022022.databinding.ActivityNoteViewBinding

class NoteViewActivity : AppCompatActivity() {
    private lateinit var binding: ActivityNoteViewBinding

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        // setContentView(R.layout.activity_note_view)
        binding = ActivityNoteViewBinding.inflate(layoutInflater)
        setContentView(binding.root)
        setSupportActionBar(binding.toolbar)
        var note = intent.getSerializableExtra("Object") as Note
        with(note)
        {
            binding.noteTitle.text = this.title
            binding.noteSubtitle.text = this.subTitle
            binding.noteContent.text = this.Description
            binding.noteDate.text = this.modifiedTime
            this.calcReminder()
            if (this.isReminder){
                binding.noteReminderDateTime.visibility = View.VISIBLE

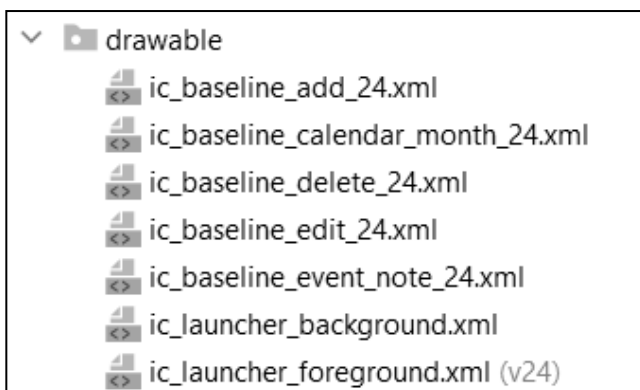
                binding.noteReminderDateTime.text = this.getReminderText()
            }
            else{
                binding.noteReminderDateTime.visibility = View.GONE
            }
        }
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.example.madpractical11_21012022022">
    <uses-permission android:name="android.permission.SET_ALARM"/>
    <uses-permission android:name="android.permission.SCHEDULE_EXACT_ALARM"/>
    <uses-permission android:name="android.permission.ACCESS_NOTIFICATION_POLICY"/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="MADPractical11"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportRtl="true"
        android:theme="@style/Theme.MADPractical11_21012022022"
        tools:targetApi="31">
        <receiver
            android:name=".AlarmBroadcastReceiver"
            android:enabled="true"
            android:exported="true"/>
        <activity
            android:name=".NoteViewActivity"
            android:exported="false" />
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

Resources:



Practical: 11

Output:

