Adaptive Mail: A Flexible Email Client App

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1 INTRODUCTION

1.1 OVERVIEW

Adaptive Mail app is a sample project that demonstrates how to use the Android Compose UI toolkit to build a conversational UI. The app simulates a messaging interface, allowing the user to send and receive messages, and view a history of previous messages. It showcases some of the key features of the Compose UI toolkit, data management, and user interactions.

PROJECT FLOW

- **Users register into the application.**
- **After registration , user logins into the application.**
- **User enters into the main page**
- **User can View previously sent emails.**
- **User can give subject and email body to send email**

1.2 PURPOSE

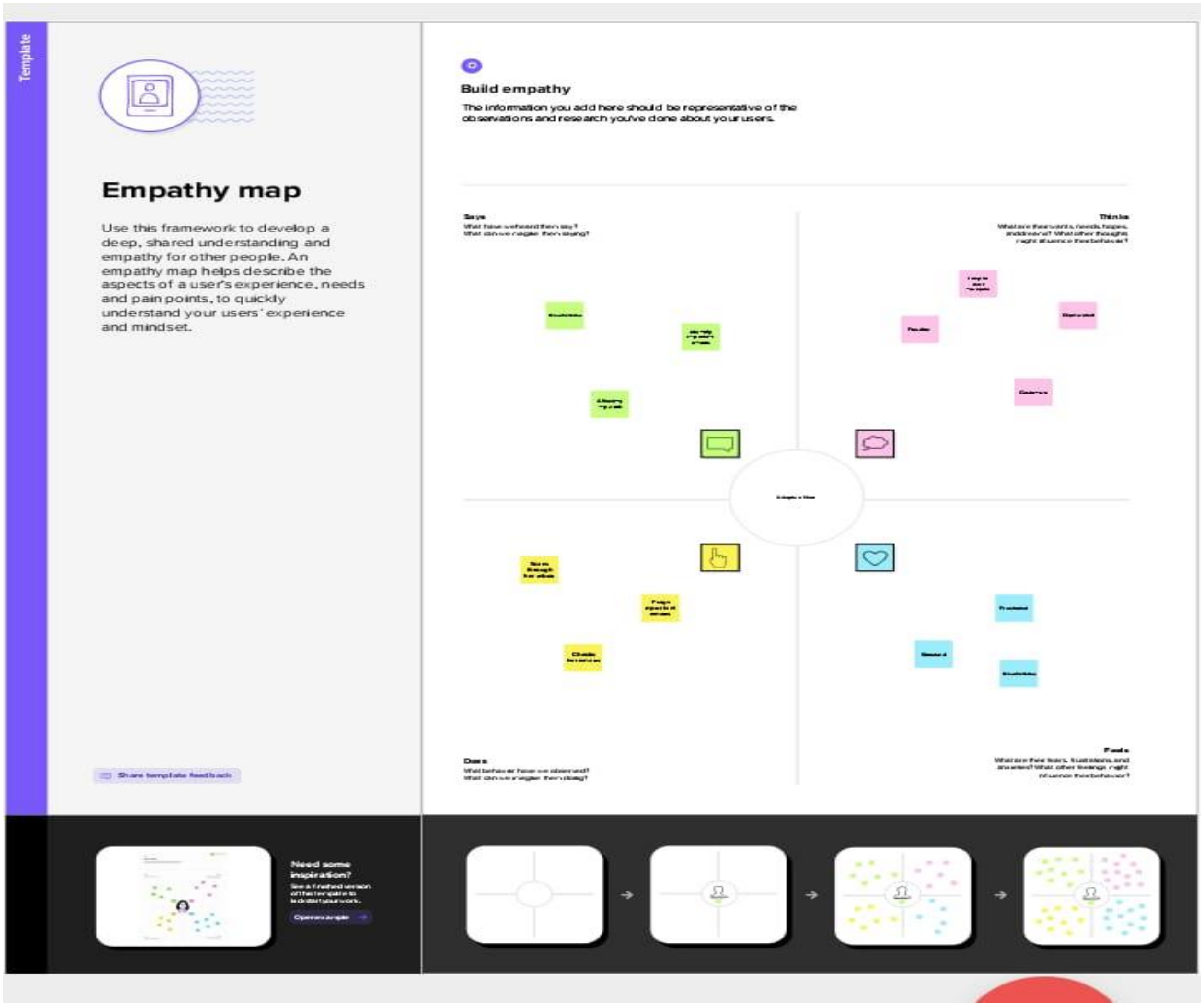
The purpose of an adaptive mail client app is to provide a flexible and customizable email experience to users. Unlike traditional email clients that offer limited customization options, adaptive mail clients can be tailored to meet the unique needs and preferences of individual users.

Adaptive mail apps may offer features such as customizable layouts, the ability to create custom tags and labels for organizing emails, and the ability to integrate with other productivity tools such as calendars and task managers. Additionally, adaptive mail clients may use machine learning algorithms to learn a user's email habits and prioritize messages accordingly, making it easier to manage a high volume of emails.

Overall, the goal of an adaptive mail client is to improve the email experience for users by providing them with greater control and customization over their inbox while also leveraging technology to streamline and automate certain aspects of email management.

2. PROBLEM DEFINITION & DESIGN THINKING

2.1 EMPATHY MAP



Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

Build empathy

The information you add here should be representative of the observations and research you've done about your users.

Says
What have we heard them say?
What can we imagine them saying?

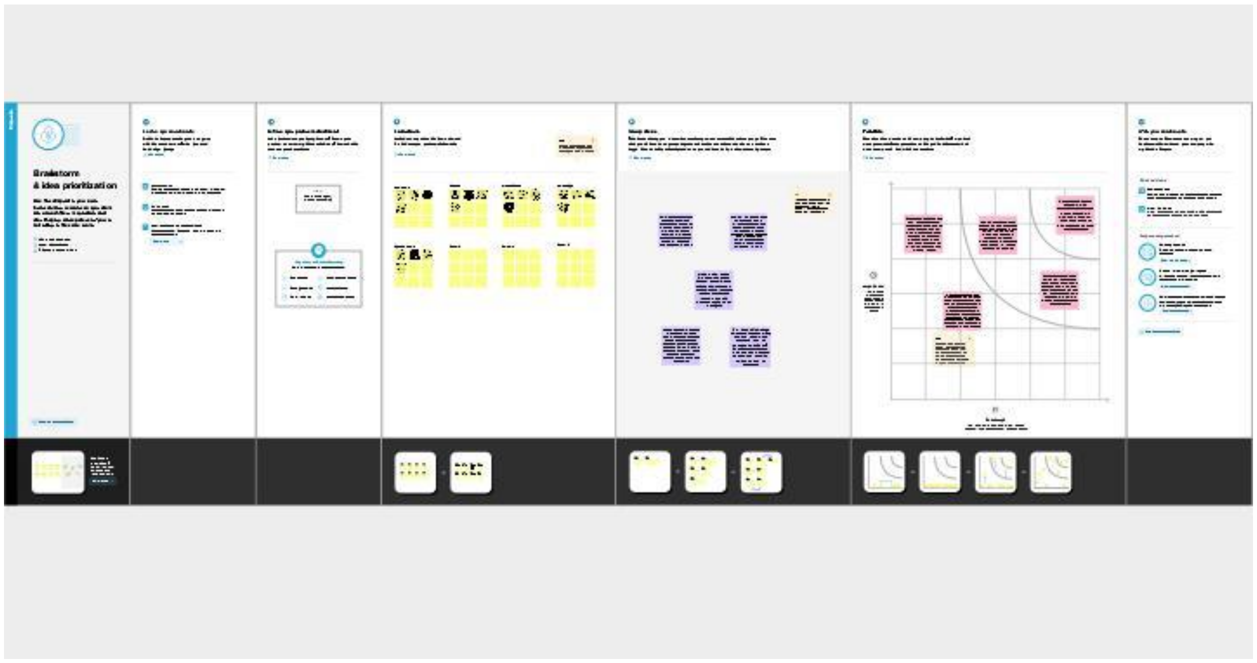
Thinks
What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?

Does
What behavior have we observed?
What can we imagine them doing?

Feels
What are their fears, frustrations, and anxieties? What other feelings might influence their behavior?

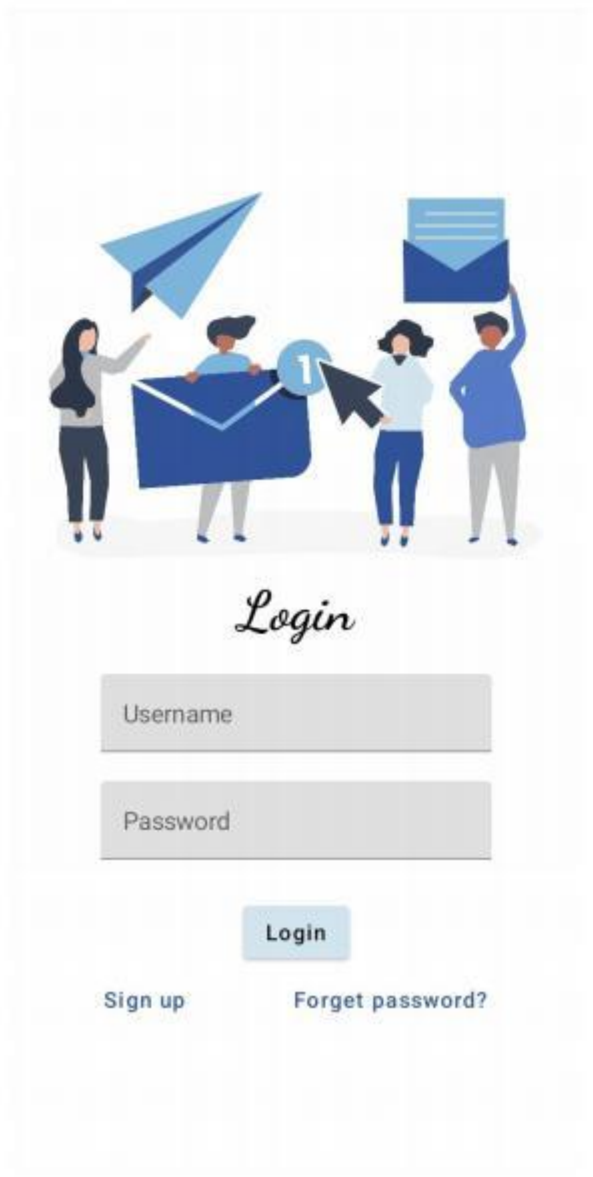
Need some inspiration?
See a finished version of this template to kickstart your work.

2.1 Ideation & brainstorming map

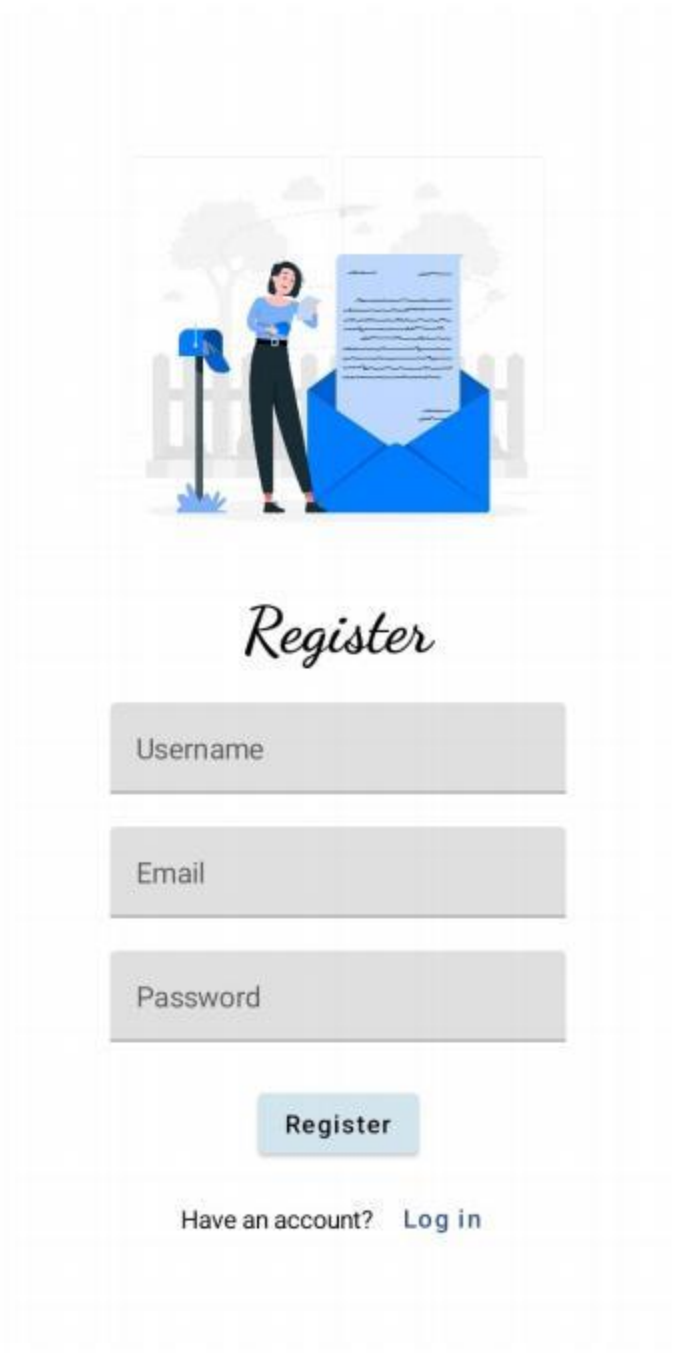


3 RESULT

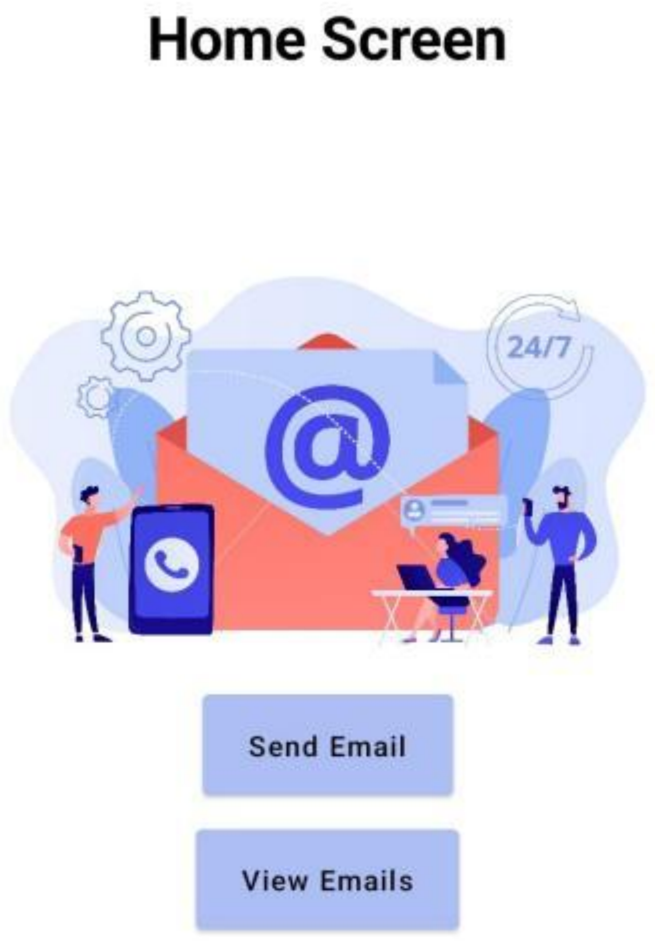
LOGIN PAGE:



REGISTER PAGE:


Register
Username
Email
Password
Register
Have an account? Log in

MAIN PAGE:



ADVANTAGES AND DISADVANTAGES

Advantages:

Customizable interface: Adaptive Mail allows users to customize the interface to suit their preferences, including changing the color scheme, layout, and font size.

Personalization: The app uses machine learning algorithms to personalize the email experience for each user, including categorizing emails based on importance and predicting which emails the user is likely to respond to.

Time-saving features: Adaptive Mail includes features that help users save time, such as quick reply options, automated email categorization, and the ability to schedule emails to be sent later.

Cross-platform compatibility: Adaptive Mail is available on multiple platforms, including iOS, Android, and desktop, making it easy for users to access their emails from anywhere.

Disadvantages:

Learning curve: Because Adaptive Mail is highly customizable and has many features, it may take some time for users to learn how to use all of its functions effectively.

Privacy concerns: Since the app uses machine learning algorithms to personalize the email experience, some users may be concerned about their data privacy.

Compatibility issues: Adaptive Mail may not be compatible with all email providers, so some users may need to switch email providers to use the app.

Cost: Adaptive Mail may not be a free app and may require a subscription, which may be a disadvantage for users who are looking for a free email client app.

4 APPLICATIONS

Personalized email management: An adaptive email client could use machine learning algorithms to learn a user's email management preferences and automatically categorize incoming messages into folders or tags. For example, if a user tends to file emails from certain senders or with certain keywords, the app could learn to do this automatically and save the user time.

Mobile optimization: Many people use their phones as their primary device for checking email, but not all email clients are optimized for mobile. An adaptive email client could adjust its user interface based on the device being used, making it easier to read and respond to emails on a small screen.

Multilingual support: If a user regularly receives emails in multiple languages, an adaptive email client could use natural language processing to automatically translate emails into the user's preferred language. This could save time and help ensure that important information isn't missed due to a language barrier.

Email automation: An adaptive email client could integrate with other productivity tools and automate certain email-related tasks. For example, it could automatically send follow-up emails after a certain amount of time, or automatically archive or delete messages that meet certain criteria.

Customizable interface: Different people have different preferences when it comes to email interfaces. An adaptive email client could allow users to customize the layout, color scheme, and other aspects of the app to suit their individual preferences.

5 CONCLUSION

In conclusion, an adaptive email client app has the potential to revolutionize the way we manage our email. By using machine learning algorithms and natural language processing, it can learn a user's preferences and adapt to their individual needs, making it easier and more efficient to manage emails. The app could also optimize for mobile devices, support multiple languages, automate certain email-related tasks, and allow for customization of the user interface. Overall, an adaptive email client app has the potential to save time, increase productivity, and improve the email experience for users.

6 FUTURE SCOPE

Integration with smart home devices: As more and more homes become equipped with smart devices, an adaptive email client app could integrate with these devices to allow users to manage their email using voice commands or other intuitive interfaces.

Enhanced security features: Email security is a growing concern, and an adaptive email client app could incorporate advanced security features such as two-factor authentication, encryption, and anti-phishing measures to help protect users from cyber threats.

Augmented reality (AR) integration: AR technology is becoming more prevalent in our daily lives, and an adaptive email client app could use AR to display email messages in an interactive and immersive way, making it easier to digest and understand complex information.

Collaboration tools: Many people use email as a means of collaborating with colleagues or working on projects with others. An adaptive email client app could incorporate collaboration tools such as shared calendars, project management features, and real-time editing capabilities to make it easier to work together.

Personalized content delivery: An adaptive email client app could use machine learning algorithms to deliver personalized content to users based on their interests and preferences. This could include curated newsletters, articles, and other content that is tailored specifically to the user's interests.

Overall, the future scope for an adaptive email client app is vast, and the potential for innovation and improvement is endless. As technology continues to advance and our needs and preferences evolve, an adaptive email client app has the potential to become an even more valuable and indispensable tool for managing our email.

7 APPENDIX

A. Source code

Database 1

Step 1: Create user data class

```
package com.example.emailapplication
```

```
import androidx.room.ColumnInfo
import androidx.room.Entity
import androidx.room.PrimaryKey

@Entity(tableName = "user_table")
data class User(
    @PrimaryKey(autoGenerate = true) val id: Int?,
    @ColumnInfo(name = "first_name") val firstName: String?,
    @ColumnInfo(name = "last_name") val lastName: String?,
    @ColumnInfo(name = "email") val email: String?,
    @ColumnInfo(name = "password") val password: String?,

    )
```

Step 2:

Create userdao interface

```
package com.example.emailapplication

import androidx.room.*

@Dao
```

```
interface UserDao {

    @Query("SELECT * FROM user_table WHERE email =
:email")
    suspend fun getUserByEmail(email: String): User?

    @Insert(onConflict = OnConflictStrategy.REPLACE)
    suspend fun insertUser(user: User)

    @Update
    suspend fun updateUser(user: User)

    @Delete
    suspend fun deleteUser(user: User)
}
```

Step 3: create an userdatabase class

```
package com.example.emailapplication

import android.content.Context
import androidx.room.Database
import androidx.room.Room
import androidx.room.RoomDatabase

@Database(entities = [User::class], version = 1)
abstract class UserDatabase : RoomDatabase() {

    abstract fun userDao(): UserDao

    companion object {

        @Volatile
        private var instance: UserDatabase? = null

        fun getDatabase(context: Context): UserDatabase {
            return instance ?: synchronized(this) {
                val newInstance = Room.databaseBuilder(
                    context.applicationContext,
                    UserDatabase::class.java,
                    "user_database"
                ).build()
                instance = newInstance
                newInstance
            }
        }
    }
```

Step 4: create an userdatabasehelper class

```
package com.example.emailapplication

import android.annotation.SuppressLint
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper

class UserDatabaseHelper(context: Context) :
    SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {

    companion object {
        private const val DATABASE_VERSION = 1
        private const val DATABASE_NAME = "UserDatabase.db"

        private const val TABLE_NAME = "user_table"
        private const val COLUMN_ID = "id"
        private const val COLUMN_FIRST_NAME = "first_name"
        private const val COLUMN_LAST_NAME = "last_name"
        private const val COLUMN_EMAIL = "email"
        private const val COLUMN_PASSWORD = "password"
    }

    override fun onCreate(db: SQLiteDatabase?) {
        val createTable = "CREATE TABLE $TABLE_NAME (" +
                "$COLUMN_ID INTEGER PRIMARY KEY
AUTOINCREMENT, " +
                "$COLUMN_FIRST_NAME TEXT, " +
                "$COLUMN_LAST_NAME TEXT, " +
                "$COLUMN_EMAIL TEXT, " +
                "$COLUMN_PASSWORD TEXT" +
                ")"

        db?.execSQL(createTable)
    }

    override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int,
newVersion: Int) {
        db?.execSQL("DROP TABLE IF EXISTS $TABLE_NAME")
        onCreate(db)
    }

    fun insertUser(user: User) {
        val db = writableDatabase
        val values = ContentValues()
        values.put(COLUMN_FIRST_NAME, user.firstName)
        values.put(COLUMN_LAST_NAME, user.lastName)
        values.put(COLUMN_EMAIL, user.email)
        values.put(COLUMN_PASSWORD, user.password)
        db.insert(TABLE_NAME, null, values)
        db.close()
    }

    @SuppressLint("Range")
    fun getUserByUsername(username: String): User? {
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_FIRST_NAME = ?",
arrayOf(username))
        var user: User? = null
        if (cursor.moveToFirst()) {
            user = User(
                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),
                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),
                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
            )
        }
        cursor.close()
        db.close()
        return user

    }

    @SuppressLint("Range")

    fun getUserById(id: Int): User? {

        val db = readableDatabase

        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_ID = ?",
arrayOf(id.toString()))

        var user: User? = null

        if (cursor.moveToFirst()) {

            user = User(

                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),

                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),

                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),

                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),

                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
            )
        }
        cursor.close()
        db.close()
        return user
    }

    @SuppressLint("Range")
    fun getAllUsers(): List<User> {
        val users = mutableListOf<User>()
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME", null)
        if (cursor.moveToFirst()) {
            do {
                val user = User(
                    id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                    firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                    lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),

                    email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),

                    password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),

                )

                users.add(user)

            } while (cursor.moveToNext())

        }

        cursor.close()

        db.close()

        return users

    }

}
```

Database 2

Step 1: create email data class

package com.example.emailapplication

```
import androidx.room.ColumnInfo
import androidx.room.Entity
import androidx.room.PrimaryKey

@Entity(tableName = "email_table")
data class Email(
    @PrimaryKey(autoGenerate = true) val id: Int?,
    @ColumnInfo(name = "receiver_mail") val recevierMail: 
String?,
    @ColumnInfo(name = "subject") val subject: String?,
    @ColumnInfo(name = "body") val body: String?,
)
```

Step 2: create emaildao class

```
package com.example.emailapplication

import androidx.room.*

@Dao
interface EmailDao {
    @Query("SELECT * FROM email_table WHERE  subject=
:subject")
    suspend fun getOrderBySubject(subject: String): Email?


    @Insert(onConflict = OnConflictStrategy.REPLACE)
    suspend fun insertEmail(email: Email)


    @Update
    suspend fun updateEmail(email: Email)


    @Delete
    suspend fun deleteEmail(email: Email)
}
```

Step 3: create emaildatabase clas

```
package com.example.emailapplication


import android.content.Context
import androidx.room.Database
import androidx.room.Room
import androidx.room.RoomDatabase
```

```
@Database(entities = [Email::class], version = 1)
abstract class EmailDatabase : RoomDatabase() {

    abstract fun emailDao(): EmailDao

    companion object {

        @Volatile
        private var instance: EmailDatabase? = null

        fun getDatabase(context: Context): EmailDatabase {
            return instance ?: synchronized(this) {
                val newInstance = Room.databaseBuilder(
                    context.applicationContext,
                    EmailDatabase::class.java,
                    "email_database"
                ).build()
                instance = newInstance
                newInstance
            }
        }
    }
}
```

Step 4: create databasehelper class

```
package com.example.emailapplication

import android.annotation.SuppressLint
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper

class UserDatabaseHelper(context: Context) :
    SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {

    companion object {
        private const val DATABASE_VERSION = 1
        private const val DATABASE_NAME = "UserDatabase.db"
        private const val TABLE_NAME = "user_table"
        private const val COLUMN_ID = "id"
        private const val COLUMN_FIRST_NAME = "first_name"
        private const val COLUMN_LAST_NAME = "last_name"
        private const val COLUMN_EMAIL = "email"
        private const val COLUMN_PASSWORD = "password"
    }

    override fun onCreate(db: SQLiteDatabase?) {
        val createTable = "CREATE TABLE $TABLE_NAME (" +
                "$COLUMN_ID INTEGER PRIMARY KEY
AUTOINCREMENT, " +
                "$COLUMN_FIRST_NAME TEXT, " +
                "$COLUMN_LAST_NAME TEXT, " +
                "$COLUMN_EMAIL TEXT, " +
                "$COLUMN_PASSWORD TEXT" +
                ")"

        db?.execSQL(createTable)
    }
    override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int,
newVersion: Int) {
        db?.execSQL("DROP TABLE IF EXISTS $TABLE_NAME")
        onCreate(db)
    }

    fun insertUser(user: User) {
        val db = writableDatabase
        val values = ContentValues()
        values.put(COLUMN_FIRST_NAME, user.firstName)
        values.put(COLUMN_LAST_NAME, user.lastName)
        values.put(COLUMN_EMAIL, user.email)
        values.put(COLUMN_PASSWORD, user.password)
        db.insert(TABLE_NAME, null, values)
        db.close()
    }

    @SuppressLint("Range")
    fun getUserByUsername(username: String): User? {
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_FIRST_NAME = ?",
arrayOf(username))

        var user: User? = null

        if (cursor.moveToFirst()) {

            user = User(

                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),

                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),

                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),

                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),

                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),

            )

        }

        cursor.close()

        db.close()

        return user
```

```
    }

    @SuppressLint("Range")

    fun getUserById(id: Int): User? {

        val db = readableDatabase

        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_ID = ?",
arrayOf(id.toString()))

        var user: User? = null

        if (cursor.moveToFirst()) {

            user = User(

                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),

                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),

                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),

                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),

                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),

            )
        }
        cursor.close()
        db.close()
        return user
    }

    @SuppressLint("Range")
    fun getAllUsers(): List<User> {
        val users = mutableListOf<User>()
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME", null)
        if (cursor.moveToFirst()) {
            do {
                val user = User(
                    id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                    firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                    lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),
                    email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),
                    password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
                )
                users.add(user)
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return users
    }

}
```

Step 1: creating loginactivity.kt with database

[3:32 pm, 14/04/2023] Hathija Clg: package com.example.emailapplication

```
import android.annotation.SuppressLint
import android.content.ContentValues
import android.content.Context

import android.database.Cursor

import android.database.sqlite.SQLiteDatabase

import android.database.sqlite.SQLiteOpenHelper


class UserDatabaseHelper(context: Context) :

    SQLiteOpenHelper(context, DATABASE_NAME, null,
DATABASE_VERSION) {


    companion object {

        private const val DATABASE_VERSION = 1

        private const val DATABASE_NAME = "UserDatabase.db"


        private const val TABLE_NAME = "user_table"

        private const val COLUMN_ID = "id"

        private const val COLUMN_FIRST_NAME = "first_name"

        private const val COLUMN_LAST_NAME = "last_name"

        private const val COLUMN_EMAIL = "email"

        private const val COLUMN_PASSWORD = "password"

    }
    override fun onCreate(db: SQLiteDatabase?) {
        val createTable = "CREATE TABLE $TABLE_NAME (" +
                "$COLUMN_ID INTEGER PRIMARY KEY
AUTOINCREMENT, " +
                "$COLUMN_FIRST_NAME TEXT, " +
                "$COLUMN_LAST_NAME TEXT, " +
                "$COLUMN_EMAIL TEXT, " +
                "$COLUMN_PASSWORD TEXT" +
                ")"

        db?.execSQL(createTable)
    }

    override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int,
newVersion: Int) {
        db?.execSQL("DROP TABLE IF EXISTS $TABLE_NAME")
        onCreate(db)
    }

    fun insertUser(user: User) {
        val db = writableDatabase
        val values = ContentValues()
        values.put(COLUMN_FIRST_NAME, user.firstName)
        values.put(COLUMN_LAST_NAME, user.lastName)
        values.put(COLUMN_EMAIL, user.email)
        values.put(COLUMN_PASSWORD, user.password)
        db.insert(TABLE_NAME, null, values)
        db.close()
    }

    @SuppressLint("Range")
    fun getUserByUsername(username: String): User? {
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_FIRST_NAME = ?",
arrayOf(username))
        var user: User? = null
        if (cursor.moveToFirst()) {
            user = User(
                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),
                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),
                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
            )
        }
        cursor.close()
        db.close()
        return user
    }
    @SuppressLint("Range")
    fun getUserById(id: Int): User? {
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME WHERE $COLUMN_ID = ?",
arrayOf(id.toString()))
        var user: User? = null
        if (cursor.moveToFirst()) {
            user = User(
                id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),
                email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),
                password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
            )
        }
        cursor.close()
        db.close()
        return user
    }

    @SuppressLint("Range")
    fun getAllUsers(): List<User> {
        val users = mutableListOf<User>()
        val db = readableDatabase
        val cursor: Cursor = db.rawQuery("SELECT * FROM
$TABLE_NAME", null)
        if (cursor.moveToFirst()) {
            do {
                val user = User(
                    id =
cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
                    firstName =
cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAM
E)),
                    lastName =
cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)
),
                    email =
cursor.getString(cursor.getColumnIndex(COLUMN_EMAIL)),
                    password =
cursor.getString(cursor.getColumnIndex(COLUMN_PASSWORD)
),
                )
                users.add(user)
            } while (cursor.moveToNext())
        }
        cursor.close()
        db.close()
        return users
    }

}
```

[3:33 pm, 14/04/2023] Hathija Clg: package com.example.emailapplication

```
import android.content.Context
import android.content.Intent
import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.Image
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.*
import androidx.compose.material.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier

import androidx.compose.ui.graphics.Color

import androidx.compose.ui.layout.ContentScale

import androidx.compose.ui.res.painterResource

import androidx.compose.ui.text.font.FontFamily

import androidx.compose.ui.text.font.FontWeight

import
androidx.compose.ui.text.input.PasswordVisualTransformation

import androidx.compose.ui.tooling.preview.Preview

import androidx.compose.ui.unit.dp

import androidx.compose.ui.unit.sp

import androidx.core.content.ContextCompat

import
com.example.emailapplication.ui.theme.EmailApplicationTheme


class LoginActivity : ComponentActivity() {

    private lateinit var databaseHelper: UserDatabaseHelper

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)

        databaseHelper = UserDatabaseHelper(this)

        setContent {
            LoginScreen(this, databaseHelper)
        }
    }
}
@Composable
fun LoginScreen(context: Context, databaseHelper:
UserDatabaseHelper) {


    var username by remember { mutableStateOf("") }
    var password by remember { mutableStateOf("") }
    var error by remember { mutableStateOf("") }

    Column(
        modifier = Modifier.fillMaxSize().background(Color.White),
        horizontalAlignment = Alignment.CenterHorizontally,
        verticalArrangement = Arrangement.Center
    ) {
        Image(
            painterResource(id = R.drawable.email_login),
contentDescription = ""
        )



        Text(
            fontSize = 36.sp,
            fontWeight = FontWeight.ExtraBold,
            fontFamily = FontFamily.Cursive,
            text = "Login"
        )
        Spacer(modifier = Modifier.height(10.dp))

        TextField(
            value = username,
            onValueChange = { username = it },
            label = { Text("Username") },
            modifier = Modifier.padding(10.dp)
                .width(280.dp)
        )
```

```
TextField(
    value = password,
    onValueChange = { password = it },
    label = { Text("Password") },
    visualTransformation = PasswordVisualTransformation(),
    modifier = Modifier.padding(10.dp)
        .width(280.dp)
)

if (error.isNotEmpty()) {
    Text(
        text = error,
        color = MaterialTheme.colors.error,
        modifier = Modifier.padding(vertical = 16.dp)
    )
}

Button(
    onClick = {
        if (username.isNotEmpty() && password.isNotEmpty()) {
```

```
                    val user =
databaseHelper.getUserByUsername(username)
                    if (user != null && user.password == password) {
                        error = "Successfully log in"
                        context.startActivity(
                            Intent(
                                context,
                                MainActivity::class.java
                            )
                        )
                        //onLoginSuccess()
                    }


                } else {
                    error = "Please fill all fields"
                }
            },
            colors = ButtonDefaults.buttonColors(backgroundColor =
Color(0xFFd3e5ef)),
            modifier = Modifier.padding(top = 16.dp)
        ) {
            Text(text = "Login")
        }
        Row {
            TextButton(onClick = {context.startActivity(
                Intent(
                    context,
                    RegisterActivity::class.java
                )
            )}
            )
            { Text(color = Color(0xFF31539a),text = "Sign up") }
            TextButton(onClick = {
            })

            {
                Spacer(modifier = Modifier.width(60.dp))
                Text(color = Color(0xFF31539a),text = "Forget
password?")
            }
        }
    }
```

```
}
private fun startMainPage(context: Context) {
    val intent = Intent(context, MainActivity::class.java)
    ContextCompat.startActivity(context, intent, null)
}
```

Step 2: creating register activity.kt with database

```
package com.example.emailapplication

import android.content.Context
import android.content.Intent
import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.Image
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.*
import androidx.compose.material.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale

import androidx.compose.ui.res.painterResource

import androidx.compose.ui.text.font.FontFamily

import androidx.compose.ui.text.font.FontWeight

import
androidx.compose.ui.text.input.PasswordVisualTransformation

import androidx.compose.ui.tooling.preview.Preview

import androidx.compose.ui.unit.dp

import androidx.compose.ui.unit.sp

import androidx.core.content.ContextCompat

import
com.example.emailapplication.ui.theme.EmailApplicationTheme


class RegisterActivity : ComponentActivity() {

    private lateinit var databaseHelper: UserDatabaseHelper

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)

        databaseHelper = UserDatabaseHelper(this)

        setContent {


            RegistrationScreen(this, databaseHelper)
        }
    }
}

@Composable
fun RegistrationScreen(context: Context, databaseHelper:
UserDatabaseHelper) {



    var username by remember { mutableStateOf("") }
    var password by remember { mutableStateOf("") }
    var email by remember { mutableStateOf("") }
    var error by remember { mutableStateOf("") }

    Column(
        modifier = Modifier.fillMaxSize().background(Color.White),
        horizontalAlignment = Alignment.CenterHorizontally,
        verticalArrangement = Arrangement.Center
    ) {
        Image(
            painterResource(id = R.drawable.email_signup),
contentDescription = "",
            modifier = Modifier.height(300.dp)
        )
        Text(
            fontSize = 36.sp,
            fontWeight = FontWeight.ExtraBold,
            fontFamily = FontFamily.Cursive,
            text = "Register"
        )

        Spacer(modifier = Modifier.height(10.dp))
        TextField(
            value = username,
            onValueChange = { username = it },
            label = { Text("Username") },
            modifier = Modifier
                .padding(10.dp)
                .width(280.dp)


        )
```

```
TextField(
    value = email,
    onValueChange = { email = it },
    label = { Text("Email") },
    modifier = Modifier
        .padding(10.dp)
        .width(280.dp)
)

TextField(
    value = password,
    onValueChange = { password = it },
    label = { Text("Password") },
    visualTransformation = PasswordVisualTransformation(),
    modifier = Modifier
        .padding(10.dp)
        .width(280.dp)
)
```

```
        if (error.isNotEmpty()) {
            Text(
                text = error,
                color = MaterialTheme.colors.error,
                modifier = Modifier.padding(vertical = 16.dp)
            )
        }

        Button(
            onClick = {
                if (username.isNotEmpty() && password.isNotEmpty()
&& email.isNotEmpty()) {
                    val user = User(
                        id = null,
                        firstName = username,
                        lastName = null,
                        email = email,
                        password = password
                    )
                    databaseHelper.insertUser(user)
                    error = "User registered successfully"
                    // Start LoginActivity using the current context
                    context.startActivity(
                        Intent(
                            context,
                            LoginActivity::class.java
                        )
                    )

                } else {
                    error = "Please fill all fields"
                }
            },
            colors = ButtonDefaults.buttonColors(backgroundColor =
Color(0xFFd3e5ef)),
            modifier = Modifier.padding(top = 16.dp)
        ) {
            Text(text = "Register")
        }
        Spacer(modifier = Modifier.width(10.dp))
        Spacer(modifier = Modifier.height(10.dp))
```

```
}

        Row() {
            Text(
                modifier = Modifier.padding(top = 14.dp), text = "Have
an account?"
            )
            TextButton(onClick = {
                context.startActivity(
                    Intent(
                        context,
                        LoginActivity::class.java
                    )
                )
            })

            {
                Spacer(modifier = Modifier.width(10.dp))
                Text(color = Color(0xFF31539a),text = "Log in")
            }
        }
    }
}
```

```
private fun startLoginActivity(context: Context) {
    val intent = Intent(context, LoginActivity::class.java)
    ContextCompat.startActivity(context, intent, null)
}
```

Step 3: mainactivity.kt

```
package com.example.emailapplication


import android.content.Context
import android.content.Intent
import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.Image
import androidx.compose.foundation.background
import androidx.compose.foundation.layout.*
import androidx.compose.material.*
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale
import androidx.compose.ui.res.painterResource

import androidx.compose.ui.text.font.FontWeight

import androidx.compose.ui.tooling.preview.Preview

import androidx.compose.ui.unit.dp

import androidx.compose.ui.unit.sp

import androidx.core.content.ContextCompat

import androidx.core.content.ContextCompat.startActivity

import
com.example.emailapplication.ui.theme.EmailApplicationTheme


class MainActivity : ComponentActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)

        setContent {

                // A surface container using the 'background' color from
the theme

                Surface(

                    modifier =
Modifier.fillMaxSize().background(Color.White),

                ) {

                    Email(this)

                }
        }
    }
}

@Composable
fun Email(context: Context) {
    Text(
        text = "Home Screen",
        modifier = Modifier.padding(top = 74.dp, start = 100.dp,
bottom = 24.dp),
        color = Color.Black,
        fontWeight = FontWeight.Bold,
        fontSize = 32.sp
    )

    Column(
        horizontalAlignment = Alignment.CenterHorizontally,
        verticalArrangement = Arrangement.Center
    ) {
        Image(
            painterResource(id = R.drawable.home_screen),
contentDescription = ""
        )



        Button(onClick = {
            context.startActivity(
                Intent(
                    context,
                    SendMailActivity::class.java
                )
            )
        },
            colors = ButtonDefaults.buttonColors(backgroundColor =
Color(0xFFadbef4))
        ) {
            Text(
                text = "Send Email",
                modifier = Modifier.padding(10.dp),
                color = Color.Black,
                fontSize = 15.sp
            )
        }

        Spacer(modifier = Modifier.height(20.dp))

        Button(onClick = {
            context.startActivity(
                Intent(
                    context,
                    ViewMailActivity::class.java
                )
            )
        },
            colors = ButtonDefaults.buttonColors(backgroundColor =
Color(0xFFadbef4))
        ) {
            Text(
                text = "View Emails",
                modifier = Modifier.padding(10.dp),
                color = Color.Black,
                fontSize = 15.sp
            )
        }



    }
}
```

Step 4:

Creating sendmailactivity.kt file

```
mport android.annotation.SuppressLint
import android.content.Context
import android.content.Intent
import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.layout.*
import androidx.compose.material.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalContext

import androidx.compose.ui.text.TextStyle

import androidx.compose.ui.text.font.FontWeight

import androidx.compose.ui.text.style.TextAlign

import androidx.compose.ui.tooling.preview.Preview

import androidx.compose.ui.unit.dp

import androidx.compose.ui.unit.sp

import
com.example.emailapplication.ui.theme.EmailApplicationTheme


class SendMailActivity : ComponentActivity() {

    private lateinit var databaseHelper: EmailDatabaseHelper

    @SuppressLint("UnusedMaterialScaffoldPaddingParameter")

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)

        databaseHelper = EmailDatabaseHelper(this)

        setContent {


            Scaffold(

                // in scaffold we are specifying top bar.

                topBar = {
```

```
                // inside top bar we are specifying
                // background color.
                TopAppBar(backgroundColor = Color(0xFFadbef4),
modifier = Modifier.height(80.dp),
                    // along with that we are specifying
                    // title for our top bar.
                    title = {
                        // in the top bar we are specifying
                        // title as a text
                        Text(
                            // on below line we are specifying
                            // text to display in top app bar.
                            text = "Send Mail",
                            fontSize = 32.sp,
                            color = Color.Black,

                            // on below line we are specifying
                            // modifier to fill max width.
                            modifier = Modifier.fillMaxWidth(),

                            // on below line we are
```

```
                                        // specifying text alignment.
                                        textAlign = TextAlign.Center,
                                    )
                                }
                            )
                        }
                    ) {
                        // on below line we are
                        // calling method to display UI.
                        openEmailer(this,databaseHelper)
                    }
                }
            }
        }
@Composable
fun openEmailer(context: Context, databaseHelper:
EmailDatabaseHelper)  {


    // in the below line, we are
    // creating variables for URL
    var recevierMail by remember {mutableStateOf("") }
    var subject by remember {mutableStateOf("") }

    var body by remember {mutableStateOf("") }

    var error by remember { mutableStateOf("") }


    // on below line we are creating

    // a variable for a context

    val ctx = LocalContext.current


    // on below line we are creating a column

    Column(

        // on below line we are specifying modifier

        // and setting max height and max width

        // for our column

        modifier = Modifier

            .fillMaxSize()

            .padding(top = 55.dp, bottom = 25.dp, start = 25.dp, end =
25.dp),

        horizontalAlignment = Alignment.Start

    ) {


        // on the below line, we are
// creating a text field.
Text(text = "Receiver Email-Id",
    fontWeight = FontWeight.Bold,
    fontSize = 16.sp)
TextField(
    // on below line we are specifying
    // value for our  text field.
    value = recevierMail,

    // on below line we are adding on value
    // change for text field.
    onValueChange = { recevierMail = it },

    // on below line we are adding place holder as text
    label = { Text(text = "Email address") },
    placeholder = { Text(text = "abc@gmail.com") },

    // on below line we are adding modifier to it
    // and adding padding to it and filling max width
    modifier = Modifier
        .padding(16.dp)
```

```
                .fillMaxWidth(),

            // on below line we are adding text style
            // specifying color and font size to it.
            textStyle = TextStyle(color = Color.Black, fontSize =
15.sp),

            // on below line we are
            // adding single line to it.
            singleLine = true,
        )
        // on below line adding a spacer.
        Spacer(modifier = Modifier.height(10.dp))

        Text(text = "Mail Subject",
            fontWeight = FontWeight.Bold,
            fontSize = 16.sp)
        // on the below line, we are creating a text field.
        TextField(
            // on below line we are specifying
            // value for our  text field.
            value = subject,

            // on below line we are adding on value change
            // for text field.
            onValueChange = { subject = it },

            // on below line we are adding place holder as text
            placeholder = { Text(text = "Subject") },

            // on below line we are adding modifier to it
            // and adding padding to it and filling max width
            modifier = Modifier
                .padding(16.dp)
                .fillMaxWidth(),

            // on below line we are adding text style
            // specifying color and font size to it.
            textStyle = TextStyle(color = Color.Black, fontSize =
15.sp),

            // on below line we are
```

```
    // adding single line to it.
    singleLine = true,
)

// on below line adding a spacer.
Spacer(modifier = Modifier.height(10.dp))

Text(text = "Mail Body",
    fontWeight = FontWeight.Bold,
    fontSize = 16.sp)
// on the below line, we are creating a text field.
TextField(
    // on below line we are specifying
    // value for our  text field.
    value = body,

    // on below line we are adding on value
    // change for text field.
    onValueChange = { body = it },

    // on below line we are adding place holder as text
```

```
            placeholder = { Text(text = "Body") },

            // on below line we are adding modifier to it
            // and adding padding to it and filling max width
            modifier = Modifier
                .padding(16.dp)
                .fillMaxWidth(),

            // on below line we are adding text style
            // specifying color and font size to it.
            textStyle = TextStyle(color = Color.Black, fontSize =
15.sp),

            // on below line we are
            // adding single line to it.
            singleLine = true,
        )

        // on below line adding a spacer.
        Spacer(modifier = Modifier.height(20.dp))
        // on below line adding a

        // button to send an email

        Button(onClick = {


            if( recevierMail.isNotEmpty() && subject.isNotEmpty() &&
    body.isNotEmpty()) {

                val email = Email(

                    id = null,

                    recevierMail = recevierMail,

                    subject = subject,

                    body = body


                )

                databaseHelper.insertEmail(email)

                error = "Mail Saved"

            } else {

                error = "Please fill all fields"

            }


            // on below line we are creating

            // an intent to send an email
            val i = Intent(Intent.ACTION_SEND)


            // on below line we are passing email address,
            // email subject and email body
            val emailAddress = arrayOf(recevierMail)
            i.putExtra(Intent.EXTRA_EMAIL,emailAddress)
            i.putExtra(Intent.EXTRA_SUBJECT,subject)
            i.putExtra(Intent.EXTRA_TEXT,body)


            // on below line we are
            // setting type of intent
            i.setType("message/rfc822")


            // on the below line we are starting our activity to open
email application.
            ctx.startActivity(Intent.createChooser(i,"Choose an Email
client : "))


        },
            colors = ButtonDefaults.buttonColors(backgroundColor =
Color(0xFFd3e5ef))
        ) {
            // on the below line creating a text for our button.
            Text(
                // on below line adding a text ,
                // padding, color and font size.
                text = "Send Email",
                modifier = Modifier.padding(10.dp),
                color = Color.Black,
                fontSize = 15.sp
            )
        }
    }
}
```

Step 5: creating viewmailactivity.kt file

```
package com.example.emailapplication

import android.annotation.SuppressLint
import android.os.Bundle
import android.util.Log
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.Image
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.layout.R
import androidx.compose.foundation.lazy.LazyColumn
import androidx.compose.foundation.lazy.LazyRow
import androidx.compose.foundation.lazy.items
import androidx.compose.material.*
import androidx.compose.runtime.Composable
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.tooling.preview.Preview
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import
com.example.emailapplication.ui.theme.EmailApplicationTheme


class ViewMailActivity : ComponentActivity() {
    private lateinit var emailDatabaseHelper: EmailDatabaseHelper
    @SuppressLint("UnusedMaterialScaffoldPaddingParameter")
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        emailDatabaseHelper = EmailDatabaseHelper(this)
        setContent {

            Scaffold(
                // in scaffold we are specifying top bar.
                topBar = {
                    // inside top bar we are specifying
                    // background color.
                    TopAppBar(backgroundColor = Color(0xFFadbef4),
modifier = Modifier.height(80.dp),
                        // along with that we are specifying
                        // title for our top bar.
                        title = {
                            // in the top bar we are specifying
                            // title as a text
                            Text(
                                // on below line we are specifying
                                // text to display in top app bar.
                                text = "View Mails",
                                fontSize = 32.sp,
                                color = Color.Black,

                                // on below line we are specifying
                                // modifier to fill max width.
                                modifier = Modifier.fillMaxWidth(),

                                // on below line we are
                                // specifying text alignment.
                                textAlign = TextAlign.Center,
                            )
                        }
                    )
                }
            ) {
                val data = emailDatabaseHelper.getAllEmails();
                Log.d("swathi", data.toString())
                val email = emailDatabaseHelper.getAllEmails()
                ListListScopeSample(email)
            }
```

```
        }
    }
}
@Composable
fun ListListScopeSample(email: List<Email>) {
    LazyRow(
        modifier = Modifier
            .fillMaxSize(),
        horizontalArrangement = Arrangement.SpaceBetween
    ) {
        item {

            LazyColumn {
                items(email) { email ->
                    Column(
                        modifier = Modifier.padding(
                            top = 16.dp,
                            start = 48.dp,
                            bottom = 20.dp
                        )
                    ) {
                        Text("Receiver_Mail: ${email.recevierMail}",
fontWeight = FontWeight.Bold)
                        Text("Subject: ${email.subject}")
                        Text("Body: ${email.body}")
                    }
                }
            }
        }

    }
}
```

MODIFYING 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" >

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
```

```
android:fullBackupContent="@xml/backup_rules"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:supportsRtl="true"
android:theme="@style/Theme.EmailApplication"
tools:targetApi="31" >
<activity
    android:name=".RegisterActivity"
    android:exported="false"
    android:label="@string/title_activity_register"
    android:theme="@style/Theme.EmailApplication" />
<activity
    android:name=".MainActivity"
    android:exported="false"
    android:label="MainActivity"
    android:theme="@style/Theme.EmailApplication" />
<activity
    android:name=".ViewMailActivity"
    android:exported="false"
    android:label="@string/title_activity_view_mail"
    android:theme="@style/Theme.EmailApplication" />
```

```
        <activity
            android:name=".SendMailActivity"
            android:exported="false"
            android:label="@string/title_activity_send_mail"
            android:theme="@style/Theme.EmailApplication" />
        <activity
            android:name=".LoginActivity"
            android:exported="true"
            android:label="@string/app_name"
            android:theme="@style/Theme.EmailApplication" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />


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


</manifest>
```