

ANDROID APPLICATION DEVELOPMENT

An Android Application Development For Keeping The latest Headlines

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SEMESTER - V

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ABSTRACT:

Android application that uses Jetpack Compose, a contemporary UI toolkit for creating native Android user interfaces, to display news articles in a scrollable list style. It features an intuitive user interface. Because each article entry has a title, an image, and a synopsis, readers can browse and choose content that interests them with ease. Users can see all of the details on a new screen when they tap an article. Through the Retrofit library, the application dynamically retrieves data from a distant server, guaranteeing effective and instantaneous data access. The Coil library, which is renowned for its lightweight, quick-loading characteristics tailored for Android, loads images with ease. This application demonstrates how to use Coil for image handling in conjunction with Jetpack Compose's declarative UI paradigm.

PROPOSED SOLUTION:

The project Android news reader app developed in Android Studio using Jetpack Compose, Retrofit, and Coil to provide users with a streamlined way to browse and read news articles. The app's main feature is a list of articles, each displaying a title, image, and short description. Users can tap on an article to view its full content. Built on the MVVM architecture, the project maintains a clean separation between data, UI, and business logic, ensuring a maintainable codebase. Retrofit handles network requests to fetch articles from a remote server, while Coil enables efficient asynchronous loading and display of images. Jetpack Compose facilitates the creation of a modern and reactive UI, with composable functions defining each part of the screen in a structured way. The core data model includes a NewsArticle class, with a repository responsible for data retrieval and a ViewModel that manages UI state and data flow using StateFlow for reactive updates. Android Studio's development tools simplify the building, testing, and refining processes for this Compose-based UI. Planned enhancements include features like article search, offline capabilities, and push notifications for new articles. This project highlights the effective use of Android Studio with Jetpack Compose, Retrofit, and Coil to deliver a dynamic and modular Android application.

REQUIRED TOOLS:

SOFTWARE REQUIRMENTS:

1. Android Studio
2. Android SDK
3. Java Development Kit
4. Libraries : Retrofit, Gson, Coil, Koltin Coroutines.

HARDWARE REQUIEMENTS:

1. CPU: intel i5.
2. RAM: Minimum 10 GB free disk space.
3. Android Iphone (or) Physical Android device.
4. Network: Stable internet connection.

TOOLS AND VERSIONS:

1. Android-studio-2024.2.1.11-windows.exe
2. JDK version 11
3. Android SDK: level 21
4. Gradle version 8.0
5. Android Emulator : latest version
6. Kotlin 1.6.0
7. Jetpack compose version 1.2.0

TESTING:

Username: It should be in the form of an email address. This means it needs to include the special character and a valid domain.

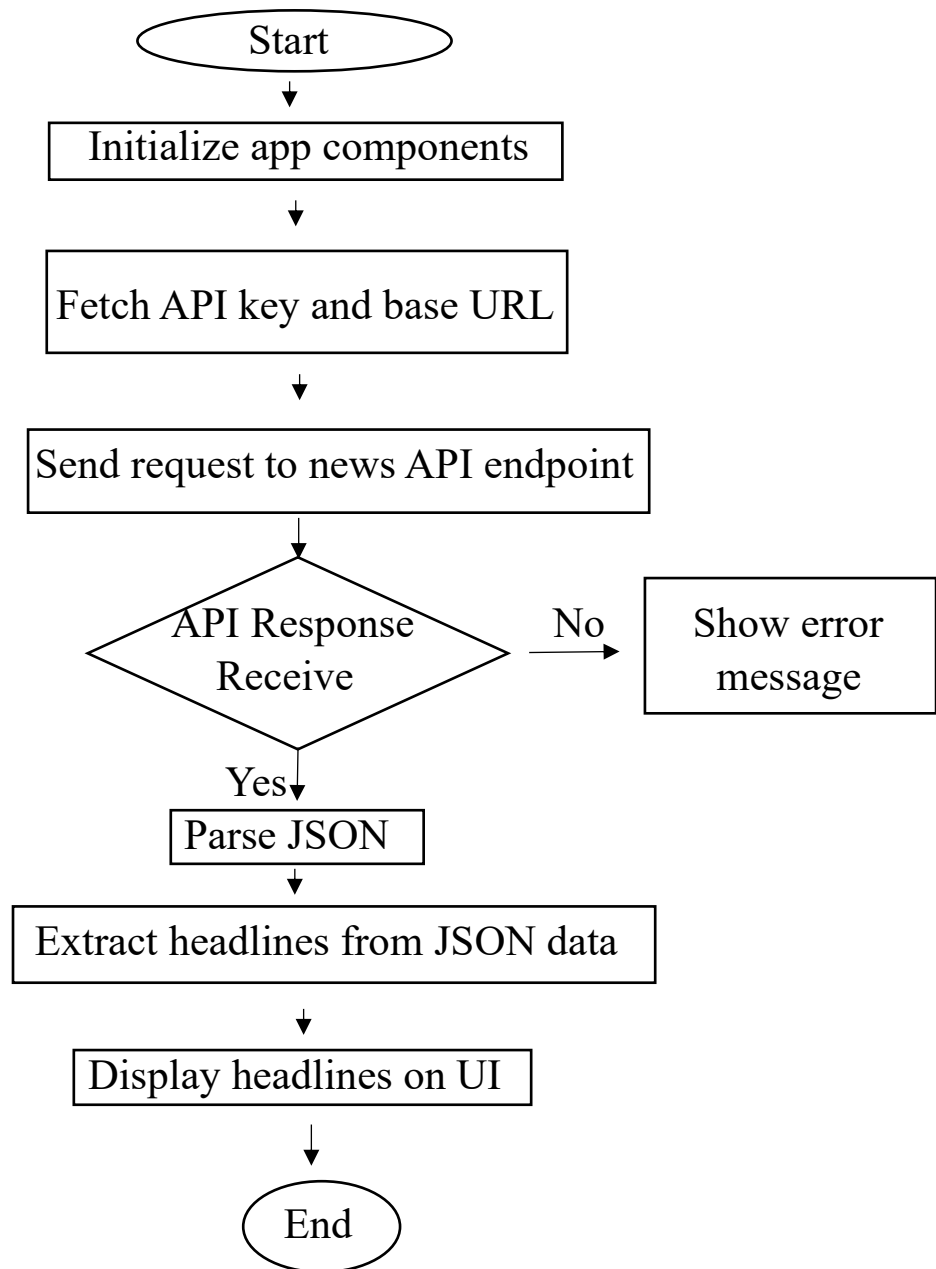
Password: It should be at least a certain number of characters long, like 8 characters, to make it strong enough.

Invalid login details: When users enter the wrong username or password, the app shows a "Incorrect username or password." This message should let them know there was an error without giving away any extra information.

Device Compatibility: Test the login page on various screen sizes and Android OS versions (if supporting multiple versions).

Response Time: Measure the time between submitting credentials and receiving a response to ensure a smooth, responsive user experience.

FLOW CHART:



SOURCE CODE:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <uses-permission android:name="android.permission.INTERNET"/>
    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE"/>
    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@drawable/news_app_icon"
        android:label="@string/app_name"
        android:supportsRtl="true"
        android:theme="@style/Theme.NewsHeadlines"
        tools:targetApi="31">
        <activity
            android:name=".DisplayNews"
            android:exported="false"
            android:label="@string/title_activity_display_news"
            android:theme="@style/Theme.NewsHeadlines" />
        <activity
            android:name=".RegistrationActivity"
            android:exported="false"
            android:label="@string/title_activity_registration"
            android:theme="@style/Theme.NewsHeadlines" />
        <activity
            android:name=".MainPage"
            android:exported="false"
            android:label="@string/title_activity_main_page"
            android:theme="@style/Theme.NewsHeadlines" />
```

```

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

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

</manifest>

```

API SERVICE:

```
package com.example.newsheadlines
```

```
import retrofit2.Retrofit
```

```
import retrofit2.converter.gson.GsonConverterFactory
```

```
import retrofit2.http.GET
```

```
interface ApiService {
```

```
    //@GET("movielist.json")
```

```
    @GET("top-
headlines?country=us&category=business&apiKey=684cb893caf7425abeffad82ac1d0f4e")
```

```
    ///@GET("search?q=chatgpt")
```

```
    suspend fun getMovies() :News
```

```
    companion object {
```

```

var apiService: ApiService? = null
fun getInstance() : ApiService {
    if (apiService == null) {
        apiService = Retrofit.Builder()
            // .baseUrl("https://howtodoandroid.com/apis/")
            .baseUrl("https://newsapi.org/v2/")
            // .baseUrl("https://podcast-episodes.p.rapidapi.com/")

            .addConverterFactory(GsonConverterFactory.create())
            .build().create(ApiService::class.java)
    }
    return apiService!!
}
}
}
}

```

ARTICLES:

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

```
import com.google.gson.annotations.SerializedName
```

```
data class Articles (
```

```
    @SerializedName("title" ) var title      : String? = null,
```

```
    @SerializedName("description" ) var description : String? = null,
```

```
    @SerializedName("urlToImage" ) var urlToImage : String? = null,
```

```
)
```

NEWS DISPLAY:

package com.example.newsheadlines

import android.content.Intent

import android.os.Bundle

import android.util.Log

import android.widget.TextView

import androidx.activity.ComponentActivity

import androidx.activity.compose.setContent

import androidx.compose.foundation.Image

import androidx.compose.foundation.background

import androidx.compose.foundation.layout.Arrangement

import androidx.compose.foundation.layout.Column

import androidx.compose.foundation.layout.fillMaxSize

import androidx.compose.foundation.layout.padding

import androidx.compose.material.MaterialTheme

import androidx.compose.material.Surface

import androidx.compose.material.Text

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.tooling.preview.Preview

import androidx.compose.ui.unit.dp

import androidx.compose.ui.unit.sp

import androidx.compose.ui.viewinterop.AndroidView

import androidx.core.text.HtmlCompat

import coil.compose.rememberImagePainter

import com.example.newsheadlines.ui.theme.NewsHeadlinesTheme


```

class DisplayNews : ComponentActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView {
            NewsHeadlinesTheme {
                // A surface container using the 'background' color from the theme
                Surface(
                    modifier = Modifier.fillMaxSize(),
                    color = MaterialTheme.colors.background
                ) {

                    var desk = getIntent().getStringExtra("desk")
                    var title = getIntent().getStringExtra("title")
                    var uriImage = getIntent().getStringExtra("urlToImage")
                    Log.i("test123abc", "MovieItem: $desk")

                    Column(Modifier.background(Color.Gray).padding(20.dp),
horizontalAlignment = Alignment.CenterHorizontally, verticalArrangement =
Arrangement.Center) {
                        Text(text = ""+title, fontSize = 32.sp)
                        HtmlText(html = desk.toString())
                        /* AsyncImage(
                            model = "https://example.com/image.jpg",
                            contentDescription = "Translated description of what the image contains"
                        )*/
                        Image(
                            painter = rememberImagePainter(uriImage),
                            contentDescription = "My content description",
                        )
                    }
                }
            }
            // Greeting(desk.toString())
        }
    }
}

```

```
    }  
    }  
    }  
    }  
}
```

@Composable

```
fun Greeting(name: String) {  
    // Text(text = "Hello $name!")  
}
```

@Preview(showBackground = true)

@Composable

```
fun DefaultPreview() {  
    NewsHeadlinesTheme {  
        // Greeting("Android")  
    }  
}
```

@Composable

```
fun HtmlText(html: String, modifier: Modifier = Modifier) {  
    AndroidView(  
        modifier = modifier,  
        factory = { context -> TextView(context) },  
        update = { it.text = HtmlCompat.fromHtml(html,  
            HtmlCompat.FROM_HTML_MODE_COMPACT) }  
    )  
}
```

LOGIN ACTIVITY:

```
package com.example.newsheadlines
```

```
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.foundation.shape.RoundedCornerShape
```

```
import androidx.compose.material.*
```

```
import androidx.compose.material.icons.Icons
```

```
import androidx.compose.material.icons.filled.Lock
```

```
import androidx.compose.material.icons.filled.Person
```

```
import androidx.compose.runtime.*
```

```
import androidx.compose.ui.Alignment
```

```
import androidx.compose.ui.Modifier
```

```
import androidx.compose.ui.graphics.Color
```

```
import androidx.compose.ui.res.painterResource
```

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

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

```
import androidx.compose.ui.unit.dp
```

```
import androidx.compose.ui.unit.sp
```

```
import androidx.core.content.ContextCompat
```

```
import com.example.newsheadlines.ui.theme.NewsHeadlinesTheme
```

```
class LoginActivity : ComponentActivity() {
```

```
    private lateinit var databaseHelper: UserDatabaseHelper
```

```

override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    databaseHelper = UserDatabaseHelper(this)
    setContent {
        NewsHeadlinesTheme {
            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
        .fillMaxHeight()
        .fillMaxWidth()
        .padding(28.dp),
    horizontalAlignment = Alignment.CenterHorizontally,
    verticalArrangement = Arrangement.Center
) {
    Image(
        painter = painterResource(id = R.drawable.news),
        contentDescription = "News Icon"
    )
}

```

```
Spacer(modifier = Modifier.height(10.dp))
```

```
LoginHeader()
```

```
Spacer(modifier = Modifier.height(10.dp))
```

```
UsernameField(username) { username = it }
```

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

```
PasswordField(password) { password = it }
```

```
Spacer(modifier = Modifier.height(12.dp))
```

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

```
LoginButton {  
    if (username.isNotEmpty() && password.isNotEmpty()) {  
        val user = databaseHelper.getUserByUsername(username)  
        if (user != null && user.password == password) {  
            error = "Successfully logged in"  
            startMainPage(context)  
        } else {  
            error = "Invalid username or password"  
        }  
    }  
}
```

```

    }
  } else {
    error = "Please fill all fields"
  }
}

```

```

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

```

```

    ActionsRow(context)
  }
}

```

```

@Composable

```

```

fun LoginHeader() {

```

```

    Row {
        Divider(color = Color.LightGray, thickness = 2.dp, modifier =
Modifier.width(155.dp).padding(top = 20.dp, end = 20.dp))
        Text(text = "Login", color = Color(0xFF6495ED), fontWeight = FontWeight.Bold,
fontSize = 24.sp)
        Divider(color = Color.LightGray, thickness = 2.dp, modifier =
Modifier.width(155.dp).padding(top = 20.dp, start = 20.dp))
    }
}

```

```

@Composable

```

```

fun UsernameField(username: String, onUsernameChange: (String) -> Unit) {

```

```

    TextField(
        value = username,
        onValueChange = onUsernameChange,
        leadingIcon = {
            Icon(

```

```

        imageVector = Icons.Default.Person,
        contentDescription = "Person Icon",
        tint = Color(0xFF6495ED)
    )
},
placeholder = { Text(text = "Username", color = Color.Black) },
colors = TextFieldDefaults.textFieldColors(backgroundColor = Color.Transparent)
)
}

```

@Composable

```

fun PasswordField(password: String, onPasswordChange: (String) -> Unit) {
    TextField(
        value = password,
        onValueChange = onPasswordChange,
        leadingIcon = {
            Icon(
                imageVector = Icons.Default.Lock,
                contentDescription = "Lock Icon",
                tint = Color(0xFF6495ED)
            )
        },
        placeholder = { Text(text = "Password", color = Color.Black) },
        visualTransformation = PasswordVisualTransformation(),
        colors = TextFieldDefaults.textFieldColors(backgroundColor = Color.Transparent)
    )
}

```

@Composable

```

fun LoginButton(onClick: () -> Unit) {

```

```

Button(
    onClick = onClick,
    shape = RoundedCornerShape(20.dp),
    colors = ButtonDefaults.buttonColors(backgroundColor = Color(0xFF77a2ef)),
    modifier = Modifier.width(200.dp).padding(top = 16.dp)
) {
    Text(text = "Log In", fontWeight = FontWeight.Bold)
}
}

```

@Composable

```

fun ActionsRow(context: Context) {
    Row(modifier = Modifier.fillMaxWidth()) {
        TextButton(onClick = {
            context.startActivity(Intent(context, RegistrationActivity::class.java))
        }) {
            Text(text = "Sign up", color = Color.Black)
        }
        Spacer(modifier = Modifier.width(100.dp))
        TextButton(onClick = { /* Implement Forgot Password */ }) {
            Text(text = "Forgot password?", color = Color.Black)
        }
    }
}
}

```

```

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

```


MAINACTIVITYKT:

```
package com.example.newsheadlines
```

```
import android.content.Context
```

```
import android.content.Intent
```

```
import android.content.Intent.FLAG_ACTIVITY_NEW_TASK
```

```
import android.os.Bundle
```

```
import android.util.Log
```

```
import android.widget.TextView
```

```
import androidx.activity.ComponentActivity
```

```
import androidx.activity.compose.setContent
```

```
import androidx.activity.viewModels
```

```
import androidx.compose.foundation.Image
```

```
import androidx.compose.foundation.background
```

```
import androidx.compose.foundation.clickable
```

```
import androidx.compose.foundation.layout.*
```

```
import androidx.compose.foundation.lazy.LazyColumn
```

```
import androidx.compose.foundation.lazy.itemsIndexed
```

```
import androidx.compose.foundation.selection.selectable
```

```
import androidx.compose.foundation.shape.RoundedCornerShape
```

```
import androidx.compose.material.Card
```

```
import androidx.compose.material.MaterialTheme
```

```
import androidx.compose.material.Surface
```

```
import androidx.compose.material.Text
```

```
import androidx.compose.runtime.*
```

```
import androidx.compose.ui.Modifier
```

```
import androidx.compose.ui.graphics.Color
```

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

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

```
import androidx.compose.ui.unit.dp
```

```

import androidx.compose.ui.unit.sp
import androidx.compose.ui.viewinterop.AndroidView
import androidx.core.text.HtmlCompat
import coil.compose.rememberImagePainter
import coil.size.Scale
import coil.transform.CircleCropTransformation
import com.example.example.Articles
import com.example.newsheadlines.ui.theme.NewsHeadlinesTheme

class MainPage : ComponentActivity() {
    val mainViewModel by viewModels<MainViewModel>()
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContent {
            NewsHeadlinesTheme {
                // A surface container using the 'background' color from the theme
                Surface(color = MaterialTheme.colors.background) {
                    Column() {

                        Text(text = "Latest NEWS", fontSize = 32.sp, modifier =
Modifier.fillMaxWidth(), textAlign = TextAlign.Center)

                        MovieList(applicationContext, movieList =
mainViewModel.movieListResponse)
                            mainViewModel.getMovieList()
                        }
                    }
                }
            }
        }
    }
}

```

```

}

@Composable
fun MovieList(context: Context, movieList: List<Articles>) {
    var selectedIndex by remember { mutableStateOf(-1) }
    LazyColumn {

        itemsIndexed(items = movieList) {
            index, item ->
            MovieItem(context, movie = item, index, selectedIndex) { i ->
                selectedIndex = i
            }
        }
    }
}

```

```

@Composable
fun MovieItem(context: Context) {
    val movie = Articles(
        "Coco",
        "",
        "articl"
    )

    MovieItem(context, movie = movie, 0, 0) { i ->
        Log.i("wertystest123abc", "MovieItem: "
            +i)
    }
}

```

```
}
```

```
@Composable
```

```
fun MovieItem(context: Context, movie: Articles, index: Int, selectedIndex: Int,
```

```
    onClick: (Int) -> Unit)
```

```
{
```

```
    val backgroundColor = if (index == selectedIndex) MaterialTheme.colors.primary else  
    MaterialTheme.colors.background
```

```
    Card(
```

```
        modifier = Modifier
```

```
            .padding(8.dp, 4.dp)
```

```
            .fillMaxSize()
```

```
            .selectable(true, true, null,
```

```
                onClick = {
```

```
                    Log.i("test123abc", "MovieItem: $index/n$selectedIndex")
```

```
                })
```

```
            .clickable { onClick(index) }
```

```
            .height(180.dp), shape = RoundedCornerShape(8.dp), elevation = 4.dp
```

```
    ) {
```

```
        Surface(color = Color.White) {
```

```
            Row(
```

```
                Modifier
```

```
                    .padding(4.dp)
```

```
                    .fillMaxSize()
```

```
            )
```

```
            {
```

```
                Image(
```

```

painter = rememberImagePainter(
    data = movie.urlToImage,
    builder = {
        scale(Scale.FILL)
        placeholder(R.drawable.placeholder)
        transformations(CircleCropTransformation())
    }
),
contentDescription = movie.description,
modifier = Modifier
    .fillMaxHeight()
    .weight(0.3f)
)

```

```

Column(
    verticalArrangement = Arrangement.Center,
    modifier = Modifier
        .padding(4.dp)
        .fillMaxHeight()
        .weight(0.8f)
        .background(Color.Gray)
        .padding(20.dp)
        .selectable(true, true, null,
            onClick = {
                Log.i("test123abc", "MovieItem: $index/n${movie.description}")
                context.startActivity(
                    Intent(context, DisplayNews::class.java)
                        .setFlags(Intent.FLAG_ACTIVITY_NEW_TASK)
                        .putExtra("desk", movie.description.toString())
                )
            }
        )
)

```

```

        .putExtra("urlToImage", movie.urlToImage)
        .putExtra("title", movie.title)
    )
})
) {

    Text(
        text = movie.title.toString(),
        style = MaterialTheme.typography.subtitle1,
        fontWeight = FontWeight.Bold
    )

    HtmlText(html = movie.description.toString())
}
}
}
}
}
@Composable
fun HtmlText(html: String, modifier: Modifier = Modifier) {
    AndroidView(
        modifier = modifier
        .fillMaxSize()
        .size(33.dp),
        factory = { context -> TextView(context) },
        update = { it.text = HtmlCompat.fromHtml(html,
            HtmlCompat.FROM_HTML_MODE_COMPACT) }
    )
}
}
}

```

MAINVIEW MODEL:

```
package com.example.newsheadlines
```

```
import android.util.Log
```

```
import androidx.compose.runtime.getValue
```

```
import androidx.compose.runtime.mutableStateOf
```

```
import androidx.compose.runtime.setValue
```

```
import androidx.lifecycle.ViewModel
```

```
import androidx.lifecycle.viewModelScope
```

```
import com.example.example.Articles
```

```
import kotlinx.coroutines.launch
```

```
class MainViewModel : ViewModel() {
```

```
    var movieListResponse: List<Articles> by mutableStateOf(listOf())
```

```
    var errorMessage: String by mutableStateOf("")
```

```
    fun getMovieList() {
```

```
        viewModelScope.launch {
```

```
            val apiService = ApiService.getInstance()
```

```
            try {
```

```
                val movieList = apiService.getMovies()
```

```
                movieListResponse = movieList.articles
```

```
            }
```

```
            catch (e: Exception) {
```

```
                errorMessage = e.message.toString()
```

```
            }
```

```
        }
```

```
    }
```

```
}
```

MAIN PAGE:

```
package com.example.newsheadlines
```

```
import com.example.example.Articles
```

```
import com.google.gson.annotations.SerializedName
```

```
data class News (
```

```
    @SerializedName("status") var status:String?= null,
```

```
    @SerializedName("totalResults") var totalResults : Int? = null,
```

```
    @SerializedName("articles") var articles : ArrayList<Articles> = arrayListOf()
```

```
)
```

REGISTRATION ACTIVITY:

```
package com.example.newsheadlines
```

```
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.foundation.shape.RoundedCornerShape
```

```
import androidx.compose.material.*
```

```
import androidx.compose.material.icons.Icons
```

```
import androidx.compose.material.icons.filled.Email
```

```
import androidx.compose.material.icons.filled.Lock
```

```
import androidx.compose.material.icons.filled.Person
```



```
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.res.painterResource
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.newsheadlines.ui.theme.NewsHeadlinesTheme
```

```
class RegistrationActivity : 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
```

```
        .background(Color.White)
```

```
        .fillMaxHeight()
```

```
        .fillMaxWidth(),
```

```
horizontalAlignment = Alignment.CenterHorizontally,
```

```
verticalArrangement = Arrangement.Center)
```

```
{  
    Row {
```

```
        Text(  
            text = "Sign Up",  
            color = Color(0xFF6495ED),  
            fontWeight = FontWeight.Bold,  
            fontSize = 24.sp, style = MaterialTheme.typography.h1
```

```
        )
```

```
        Divider(  
            color = Color.LightGray, thickness = 2.dp, modifier = Modifier
```

```
                .width(250.dp)
```

```
                .padding(top = 20.dp, start = 10.dp, end = 70.dp)
```

```
        )
```

```
    }
```

```
    Image(  
        imageResource(R.drawable.sign_up)
```

```
    )
```

```
    Image(  
        imageResource(R.drawable.password)
```

```
    )
```

```
    Image(  
        imageResource(R.drawable.email)
```

```
    )
```

```
    Image(  
        imageResource(R.drawable.error)
```

```
    )
```

```
    Image(  
        imageResource(R.drawable.sign_up)
```

```
painter = painterResource(id = R.drawable.sign_up),
contentDescription = "",
modifier = Modifier.height(270.dp)
)
```

```
TextField(
    value = username,
    onChange = { username = it },
    leadingIcon = {
        Icon(
            imageVector = Icons.Default.Person,
            contentDescription = "personIcon",
            tint = Color(0xFF6495ED)
        )
    },
    placeholder = {
        Text(
            text = "username",
            color = Color.Black
        )
    },
    colors = TextFieldDefaults.textFieldColors(
        backgroundColor = Color.Transparent
    )
)
```

```
Spacer(modifier = Modifier.height(8.dp))
```

```
TextField(
```

```
value = password,
onValueChange = { password = it },
leadingIcon = {
    Icon(
        imageVector = Icons.Default.Lock,
        contentDescription = "lockIcon",
        tint = Color(0xFF6495ED)
    )
},
placeholder = { Text(text = "password", color = Color.Black) },
visualTransformation = PasswordVisualTransformation(),
colors = TextFieldDefaults.textFieldColors(backgroundColor = Color.Transparent)
)
```

```
Spacer(modifier = Modifier.height(16.dp))
```

```
TextField(
    value = email,
    onValueChange = { email = it },
    leadingIcon = {
        Icon(
            imageVector = Icons.Default.Email,
            contentDescription = "emailIcon",
            tint = Color(0xFF6495ED)
        )
    },
    placeholder = { Text(text = "email", color = Color.Black) },
    colors = TextFieldDefaults.textFieldColors(backgroundColor = Color.Transparent)
)
```

)

Spacer(modifier = Modifier.height(8.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"
    }
},
shape = RoundedCornerShape(20.dp),
colors = ButtonDefaults.buttonColors(backgroundColor = Color(0xFF77a2ef)),
modifier = Modifier.width(200.dp)
    .padding(top = 16.dp)
) {
    Text(text = "Register", fontWeight = FontWeight.Bold)
}

Row(
    modifier = Modifier.padding(30.dp),
    verticalAlignment = Alignment.CenterVertically,
    horizontalArrangement = Arrangement.Center
) {

    Text(text = "Have an account?")

    TextButton(onClick = {
        context.startActivity(
            Intent(
                context,
                LoginActivity::class.java
            )
        )
    })
}

```

```

    }) {
        Text(text = "Log in",
            fontWeight = FontWeight.Bold,
            style = MaterialTheme.typography.subtitle1,
            color = Color(0xFF4285F4)
        )}
    }
}

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

```

SOURCE:

```

package com.example.example

import com.google.gson.annotations.SerializedName

data class Source (

    @SerializedName("id" ) var id : String? = null,
    @SerializedName("name" ) var name : String? = null
)

```

USER:

```

package com.example.newsheadlines

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?,
)
```

USERDAO:

```
package com.example.newsheadlines
```

```
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)
```

```
}
```


STRING XML:

```
<resources>

    <string name="app_name">News Headlines</string>

    <string name="title_activity_main2">MainActivity2</string>

    <string name="title_activity_main_page">MainPage</string>

    <string name="title_activity_login">LoginActivity</string>

    <string name="title_activity_registration">RegistrationActivity</string>

    <string name="title_activity_display_news">DisplayNews</string>

</resources>
```

THEME XML:

```
<?xml version="1.0" encoding="utf-8"?>

<resources>

    <style name="Theme.NewsHeadlines"
parent="android:Theme.Material.Light.NoActionBar">

        <item name="android:statusBarColor">@color/purple_700</item>

    </style>

</resources>
```

COLOUR XML:

```
<?xml version="1.0" encoding="utf-8"?>

<resources>

    <color name="purple_200">#FFFFFFC107</color> <!-- Amber -->

    <color name="purple_500">#FFFF9800</color> <!-- Deep Orange -->

    <color name="purple_700">#FFF57C00</color> <!-- Darker Orange -->

    <color name="teal_200">#FF4CAF50</color> <!-- Green -->

    <color name="teal_700">#FF2E7D32</color> <!-- Dark Green -->

    <color name="black">#FF37474F</color> <!-- Blue Grey -->

    <color name="white">#FFFAFAFA</color> <!-- Light Grey -->

</resources>
```

BUILD GRADLE:

```
plugins {  
    id 'com.android.application'  
    id 'org.jetbrains.kotlin.android'  
}  
  
android {  
    namespace 'com.example.newsheadlines'  
    compileSdk 33  
  
    defaultConfig {  
        applicationId "com.example.newsheadlines"  
        minSdk 21  
        targetSdk 33  
        versionCode 1  
        versionName "1.0"  
  
        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"  
        vectorDrawables {  
            useSupportLibrary true  
        }  
    }  
  
    buildTypes {  
        release {  
            minifyEnabled false  
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'  
        }  
    }  
  
    compileOptions {
```

```
    sourceCompatibility JavaVersion.VERSION_1_8
    targetCompatibility JavaVersion.VERSION_1_8
}
kotlinOptions {
    jvmTarget = '1.8'
}
buildFeatures {
    compose true
}
composeOptions {
    kotlinCompilerExtensionVersion '1.2.0'
}
packagingOptions {
    resources {
        excludes += '/META-INF/{AL2.0,LGPL2.1}'
    }
}
}

dependencies {

    implementation 'androidx.core:core-ktx:1.7.0'
    implementation 'androidx.lifecycle:lifecycle-runtime-ktx:2.3.1'
    implementation 'androidx.activity:activity-compose:1.3.1'
    implementation "androidx.compose.ui:ui:$compose_ui_version"
    implementation "androidx.compose.ui:ui-tooling-preview:$compose_ui_version"
    implementation 'androidx.compose.material:material:1.2.0'
    implementation 'androidx.room:room-common:2.5.0'
    implementation 'androidx.room:room-ktx:2.5.0'
    testImplementation 'junit:junit:4.13.2'
```

```
androidTestImplementation 'androidx.test.ext:junit:1.1.5'
androidTestImplementation 'androidx.test.espresso:espresso-core:3.5.1'
androidTestImplementation "androidx.compose.ui:ui-test-junit4:$compose_ui_version"
debugImplementation "androidx.compose.ui:ui-tooling:$compose_ui_version"
debugImplementation "androidx.compose.ui:ui-test-manifest:$compose_ui_version"
```

```
// Retrofit
```

```
implementation 'com.squareup.retrofit2:retrofit:2.9.0'
implementation "com.squareup.okhttp3:okhttp:5.0.0-alpha.2"
implementation 'com.squareup.retrofit2:converter-gson:2.9.0'
implementation("io.coil-kt:coil-compose:1.4.0")
```

```
}
```

BACKGROUD XML:

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<vector
```

```
    android:height="108dp"
```

```
    android:width="108dp"
```

```
    android:viewportHeight="108"
```

```
    android:viewportWidth="108"
```

```
    xmlns:android="http://schemas.android.com/apk/res/android">
```

```
    <path android:fillColor="#3DDC84"
```

```
        android:pathData="M0,0h108v108h-108z"/>
```

```
    <path android:fillColor="#00000000" android:pathData="M9,0L9,108"
```

```
        android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
```

```
    <path android:fillColor="#00000000" android:pathData="M19,0L19,108"
```

```
        android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
```

```
    <path android:fillColor="#00000000" android:pathData="M29,0L29,108"
```

```
        android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
```

```
<path android:fillColor="#00000000" android:pathData="M39,0L39,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M49,0L49,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M59,0L59,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M69,0L69,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M79,0L79,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M89,0L89,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M99,0L99,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,9L108,9"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,19L108,19"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,29L108,29"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,39L108,39"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,49L108,49"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,59L108,59"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,69L108,69"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,79L108,79"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
```

```
<path android:fillColor="#00000000" android:pathData="M0,89L108,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,99L108,99"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,29L89,29"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,39L89,39"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,49L89,49"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,59L89,59"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,69L89,69"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,79L89,79"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M29,19L29,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M39,19L39,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M49,19L49,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M59,19L59,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M69,19L69,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M79,19L79,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
</vector>
```

FOREGROUND XML:

```
<vector xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:aapt="http://schemas.android.com/aapt"
    android:width="108dp"
    android:height="108dp"
    android:viewportWidth="108"
    android:viewportHeight="108">
    <path android:pathData="M31,63.928c0,0 6.4,-11 12.1,-13.1c7.2,-2.6 26,-1.4 26,-
1.4l38.1,38.1L107,108.928l-32,-1L31,63.928z">
        <aapt:attr name="android:fillColor">
            <gradient
                android:endX="85.84757"
                android:endY="92.4963"
                android:startX="42.9492"
                android:startY="49.59793"
                android:type="linear">
                <item
                    android:color="#44000000"
                    android:offset="0.0" />
                <item
                    android:color="#00000000"
                    android:offset="1.0" />
            </gradient>
        </aapt:attr>
    </path>
    <path
        android:fillColor="#FFFFFF"
        android:fillType="nonZero"
        android:pathData="M65.3,45.828l3.8,-6.6c0.2,-0.4 0.1,-0.9 -0.3,-1.1c-0.4,-0.2 -0.9,-0.1
-1.1,0.3l-3.9,6.7c-6.3,-2.8 -13.4,-2.8 -19.7,0l-3.9,-6.7c-0.2,-0.4 -0.7,-0.5 -1.1,-
0.3C38.8,38.328 38.7,38.828 38.9,39.228l3.8,6.6C36.2,49.428 31.7,56.028
```

31,63.928h46C76.3,56.028 71.8,49.428 65.3,45.828zM43.4,57.328c-0.8,0 -1.5,-0.5 -1.8,-1.2c-0.3,-0.7 -0.1,-1.5 0.4,-2.1c0.5,-0.5 1.4,-0.7 2.1,-0.4c0.7,0.3 1.2,1 1.2,1.8C45.3,56.528 44.5,57.328 43.4,57.328L43.4,57.328zM64.6,57.328c-0.8,0 -1.5,-0.5 -1.8,-1.2s-0.1,-1.5 0.4,-2.1c0.5,-0.5 1.4,-0.7 2.1,-0.4c0.7,0.3 1.2,1 1.2,1.8C66.5,56.528 65.6,57.328 64.6,57.328L64.6,57.328z"

android:strokeWidth="1"

android:strokeColor="#00000000" />

</vector>

NEWS BACKGROUND XML:

<?xml version="1.0" encoding="utf-8"?>

<vector

android:height="108dp"

android:width="108dp"

android:viewportHeight="108"

android:viewportWidth="108"

xmlns:android="http://schemas.android.com/apk/res/android">

<path android:fillColor="#3DDC84"

android:pathData="M0,0h108v108h-108z"/>

<path android:fillColor="#00000000" android:pathData="M9,0L9,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>

<path android:fillColor="#00000000" android:pathData="M19,0L19,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>

<path android:fillColor="#00000000" android:pathData="M29,0L29,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>

<path android:fillColor="#00000000" android:pathData="M39,0L39,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>

<path android:fillColor="#00000000" android:pathData="M49,0L49,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>

<path android:fillColor="#00000000" android:pathData="M59,0L59,108"

android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>


```
<path android:fillColor="#00000000" android:pathData="M69,0L69,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M79,0L79,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M89,0L89,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M99,0L99,108"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,9L108,9"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,19L108,19"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,29L108,29"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,39L108,39"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,49L108,49"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,59L108,59"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,69L108,69"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,79L108,79"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,89L108,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M0,99L108,99"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,29L89,29"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
```

```
<path android:fillColor="#00000000" android:pathData="M19,39L89,39"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,49L89,49"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,59L89,59"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,69L89,69"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M19,79L89,79"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M29,19L29,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M39,19L39,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M49,19L49,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M59,19L59,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M69,19L69,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
<path android:fillColor="#00000000" android:pathData="M79,19L79,89"
      android:strokeColor="#33FFFFFF" android:strokeWidth="0.8"/>
</vector>
```

TESTING:

[7:19 am, 15/11/2024] Preethisethuraman: package com.example.newsheadlines

```
import org.junit.Test
```

```
import org.junit.Assert.*
```

```
/**
```

```
 * Example local unit test, which will execute on the development machine (host).
```

```
 *
```

```
 * See [testing documentation](http://d.android.com/tools/testing).
```

```
 */
```

```
class ExampleUnitTest {
```

```
    @Test
```

```
    fun addition_isCorrect() {
```

```
        assertEquals(4, 2 + 2)
```

```
    }
```

```
}
```

```
[7:19 am, 15/11/2024] Preethisethuraman: /**
```

```
 * Automatically generated file. DO NOT MODIFY
```

```
 */
```

```
package com.example.newsheadlines;
```

```
public final class BuildConfig {
```

```
    public static final boolean DEBUG = Boolean.parseBoolean("true");
```

```
    public static final String APPLICATION_ID = "com.example.newsheadlines";
```

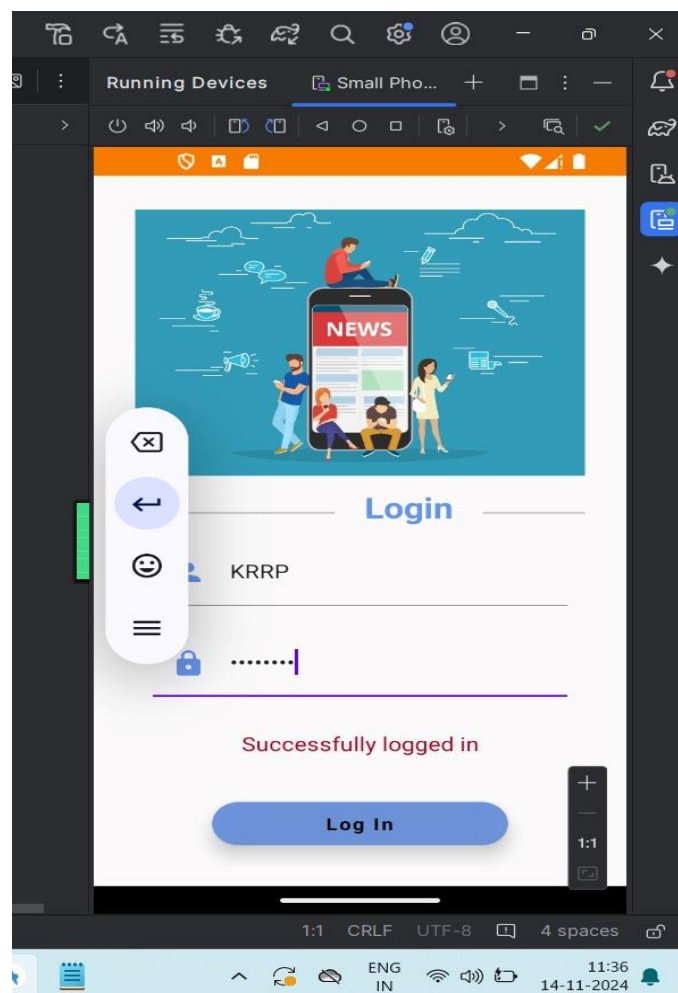
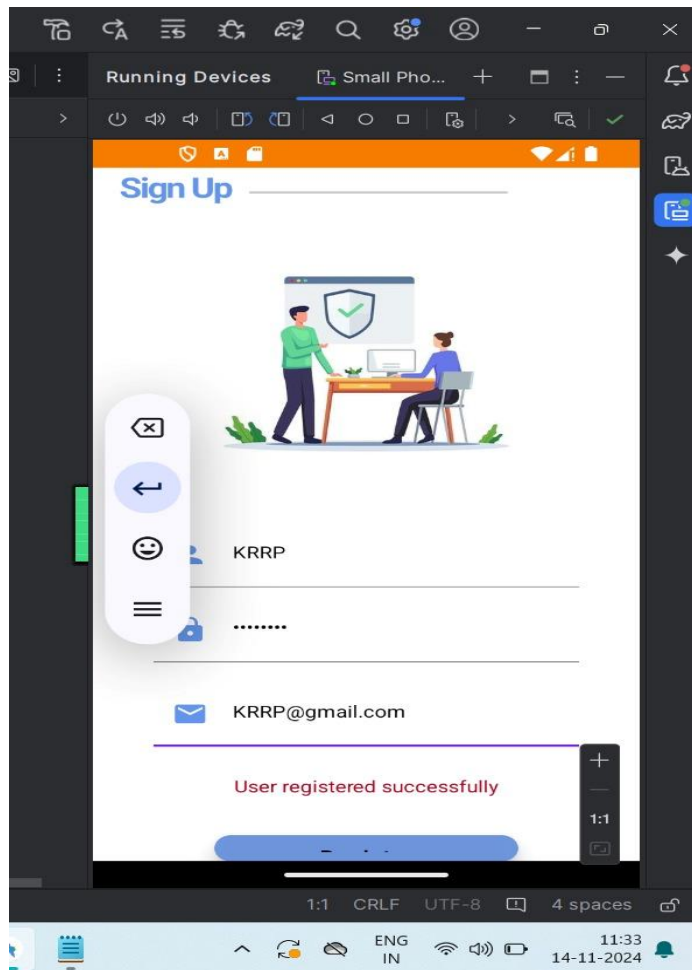
```
    public static final String BUILD_TYPE = "debug";
```

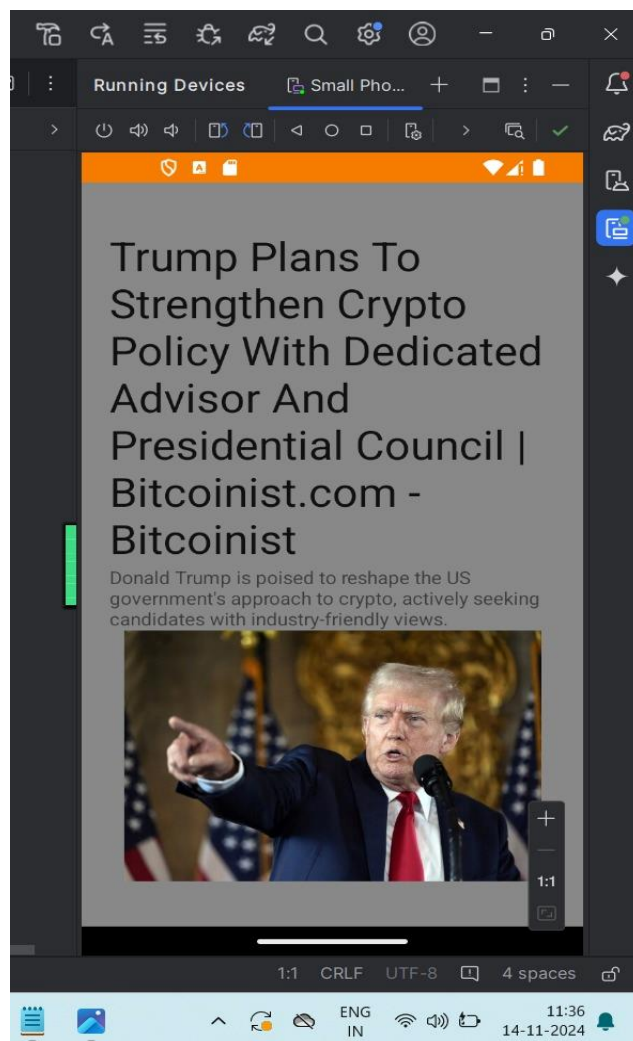
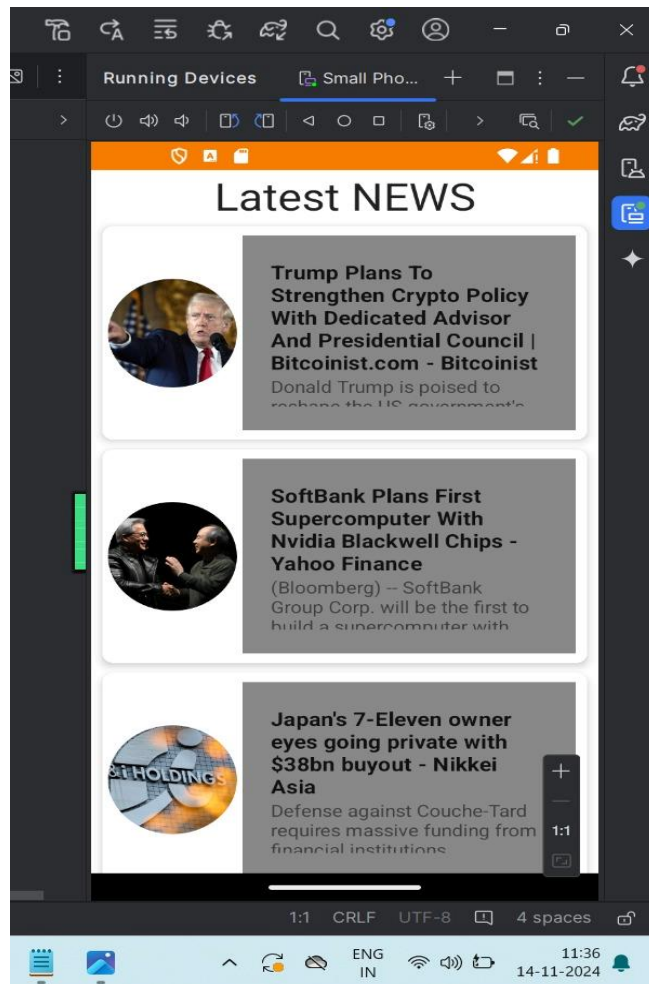
```
    public static final int VERSION_CODE = 1;
```

```
    public static final String VERSION_NAME = "1.0";
```

```
}
```

OUTPUT:





References:

News APIs: Using APIs like [News API](#), [The Guardian API](#), or [NY Times API](#) allows you to fetch the latest news articles. This is essential for keeping the app's content up-to-date.

Reference Documentation: Ensure you reference the official documentation for these APIs. For example, the News API documentation provides guidelines on authentication, querying, and usage limits.

Retrofit: Retrofit is a popular HTTP client for Android that simplifies API requests. Retrofit's documentation on [GitHub](#) is an excellent resource for understanding how to make network requests in Android.

Firebase Cloud Messaging (FCM): For real-time news updates, FCM allows you to send notifications about breaking news. Firebase provides a comprehensive guide for integrating FCM into Android apps.

GitHub/GitLab: NewsheadlinesApp for source control. Platforms like [GitHub](#) or [GitLab](#) are excellent for version control and code collaboration.

Project Hurdles:

1. API Integration: Integrating a news API can present challenges, particularly in handling API keys securely and parsing JSON responses accurately.
2. Error Handling: Managing network errors and API call failures gracefully to ensure a smooth user experience.
3. UI Consistency: Designing an intuitive UI that displays news headlines clearly while accommodating various screen sizes.

Conclusion:

This project successfully demonstrates how to fetch and display real-time news headlines using a Kotlin-based app. By integrating a news API and handling network responses, the app provides a foundation for scalable news applications. The project overcomes challenges related to API integration, error handling, and UI design, resulting in a streamlined news-viewing experience for users.