



Category: Android Application Development

Project Title

An Android Application For Keeping Up With The Latest Headlines

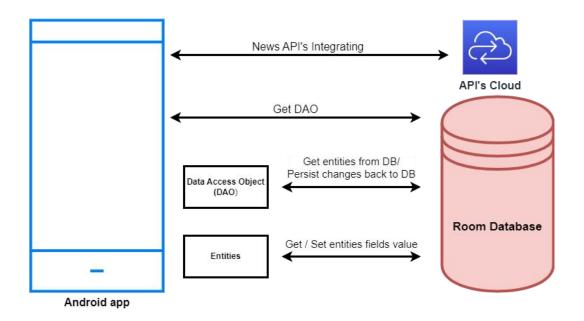
-Project Based Experiential Learning Program

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An Android Application For Keeping Up With The Latest Headlines

The app's main feature is displaying a list of news articles, each with a title, image, and brief description. Users can scroll through the list of articles and tap on an article to view more details. The app uses the Jetpack Compose UI toolkit to build the UI and it uses the coil library to load images. The app fetches data from a remote server using Retrofit library and demonstrates how to use the Jetpack Compose UI toolkit for Android development.

Architecture:



Learning Outcomes:

By end of this project:

You'll be able to work on Android studio and build an app. You'll be able to integrate the database accordingly. You'll be able to integrate the API's accordingly.

Project Workflow:

Users register into the application After registration , user logins into the application. User enters into the main page

Note:

To complete the project you need to finish up the tasks listed below:

Tasks:

- 1.Required initial steps
- 2. Creating a new project.
- 3. Adding required dependencies.
- 4. Adding permissions
- 5. Creating the database classes.
- 6. Creating API Service and required classes for integrating API
- 7. Building application UI and connecting to database.
- 8. Modifying Android Manifest.xml
- 9. Running the application.

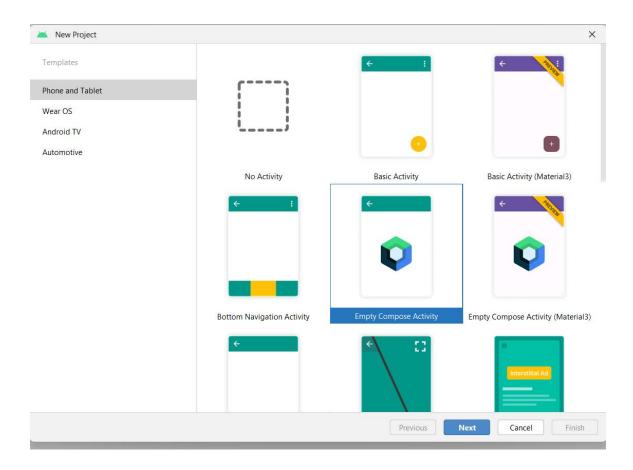
Creating A New Project

Steps need to be followed:

Step 1 : Android studio > File > New > New Project > Empty

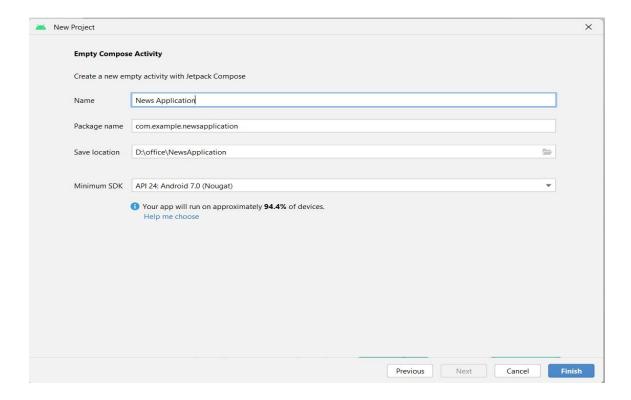
Compose Activity

Step 2 : Click on Next button.



Step 3 : Give name to the new project. Step 4 : Give the Minimum SDK value

Step 5 : Click Finish



Main activity file

Gradle Scripts > Build.Gradle(Module :App)

```
Gradle files have changed since last project sync. A project sync may be necessary for the IDE to work properly

✓ 

✓ Gradle Scripts

                                               packagingOptions {
     w build.gradle
                                                resources {
build,gradle (Module :app)

proguard-rules,pro (ProGuard Rul
      gradle.properties (Project Propert 45
      gradle-wrapper.properties (Gradle 46
      local properties (SDK Location) 47
      settings.gradle (Project Settings) 48
                                           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'
                                                No candidates found for method call
                                                                                        st.ext:junit:1.1.5'
                                                                                    st.espresso:espresso-core:3.5.1'
:
procedured mpose.ui:ui-test-junit4:$compose_ui_version"
                                                Podcast_Player.app
                                                debugImplementation "androidx.compose.ui:ui-tooling:$compose_ui_version"
                                                debugImplementation "androidx.compose.ui:ui-test-manifest:$compose_ui_version"
```

Adding Retrofit Dependencies

Adding Retrofit dependencies

// 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'

Adding Coil Dependencies

implementation("io.coil-kt:coil-compose:1.4.0")

```
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'
   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"
   // Room Database
   implementation 'androidx.room:room-common:2.5.0'
   implementation 'androidx.room:room-ktx:2.5.0'
   // 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")
```

Click on Sync now.

Adding Permissions:

Open AndroidManifest.Xml

```
| Note | Teach | Note |
```

Add Permission To Access Wifi And Internet

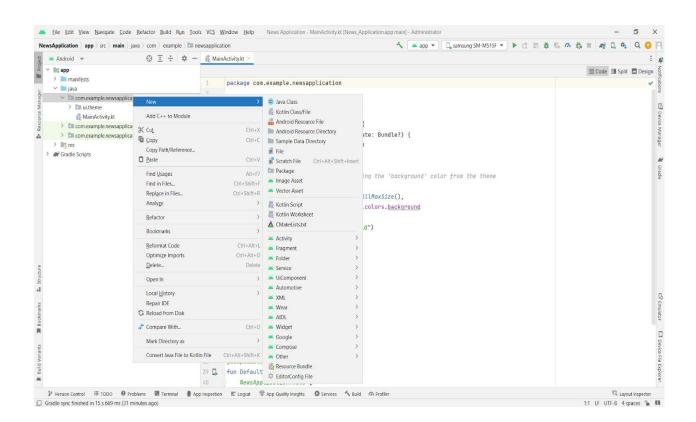
```
<!-- permissions-->
```

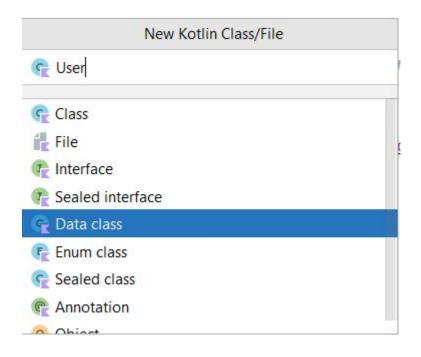
<uses-permission android:name="android.permission.INTERNET"/>
<uses-permission</pre>

android:name="android.permission.ACCESS_WIFI_STATE"/>

Creating The Database Classes:

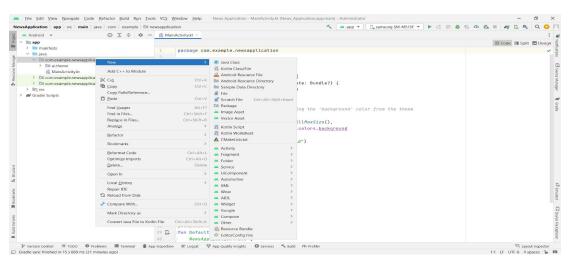
Create User Data Class

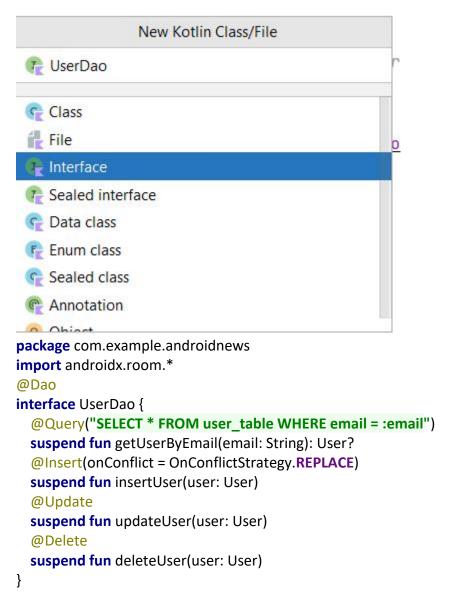




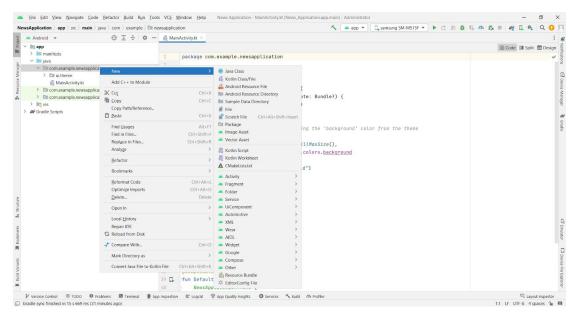
```
package com.example.androidnews
import androidx.room.ColumnInfo
import androidx.room.Entity
import androidx.room.PrimaryKey
@Entity(tableName = "user_table")
data class User(
    @PrimaryKey(autoGenerate = true) val id: Int?,
    @ColumnInfo(name = "first_name") val firstName: String?,
    @ColumnInfo(name = "last_name") val lastName: String?,
    @ColumnInfo(name = "email") val email: String?,
    @ColumnInfo(name = "password") val password: String?,
)
```

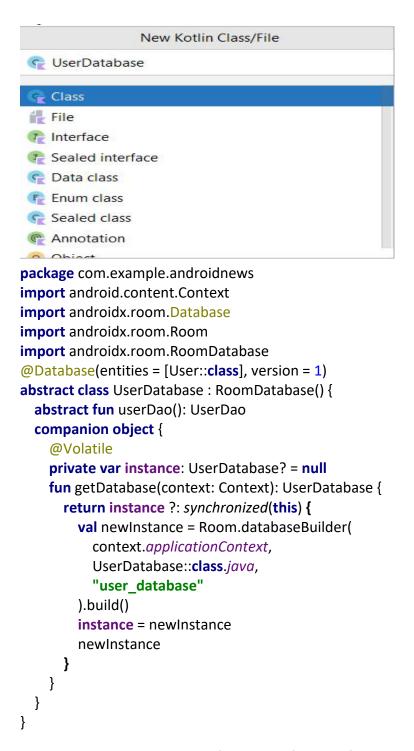
Create An UserDao Interface



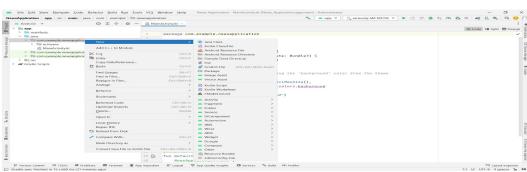


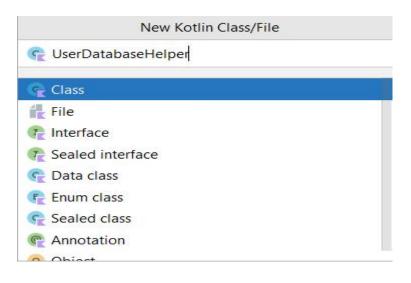
Create An UserDatabase Class





Create An UserDatabaseHelper Class



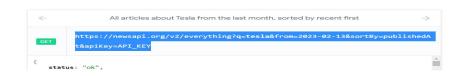


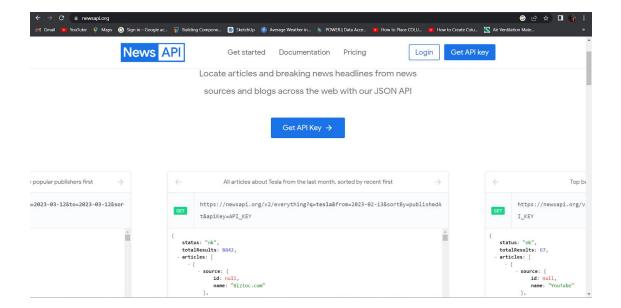
```
package com.example.androidnews
import android.annotation.SuppressLint
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper
class UserDatabaseHelper(context: 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"
  7
  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 on Upgrade (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_NAME)),
        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 getUserByld(id: Int): User? {
     val db = readableDatabase
     val cursor: Cursor = db.rawQuery("SELECT * FROM $TABLE_NAME WHERE
$COLUMN_ID = ?", arrayOf(id.toString()))
```

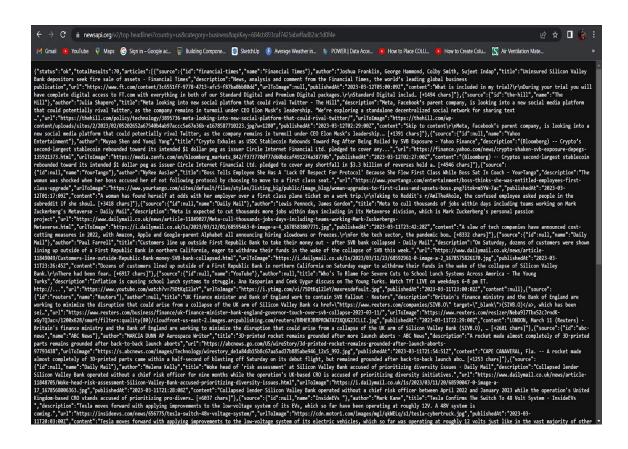
```
var user: User? = null
     if (cursor.moveToFirst()) {
         user = User(
        id = cursor.getInt(cursor.getColumnIndex(COLUMN_ID)),
      firstName = cursor.getString(cursor.getColumnIndex(COLUMN_FIRST_NAME)),
      lastName = cursor.getString(cursor.getColumnIndex(COLUMN_LAST_NAME)),
     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 = mutableListORUser>()
     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_NAME)),
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
  }
}
```

Creating API Service And Required Classes For Integrating API





JSON



Copy And Paste The Complete Json File To Json2kt.Com

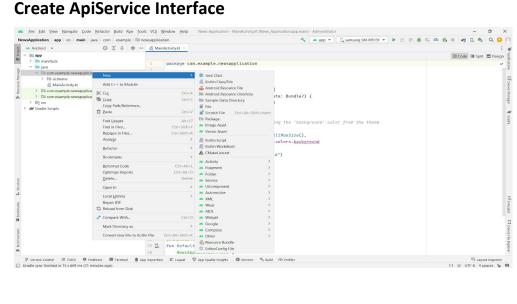


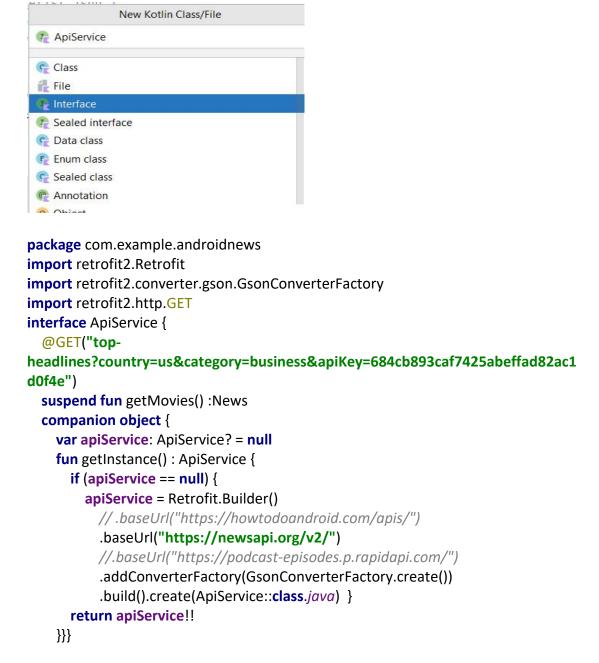
Click on Output Data class



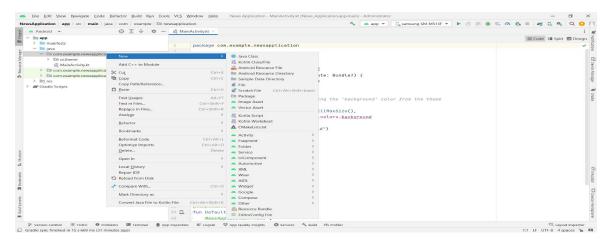
Database For News Integration Into Project

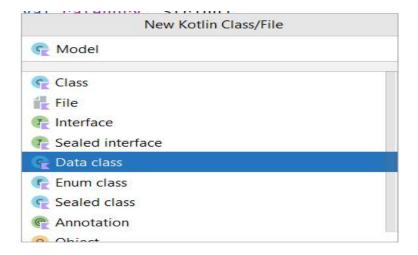
Create ApiService Interface





Create Model Data Class

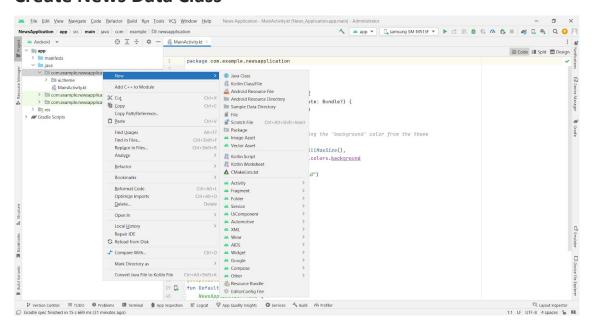


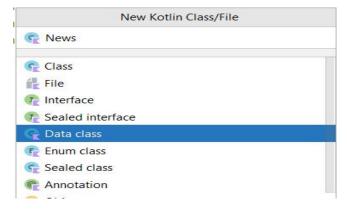


package com.example.androidnews
data class Model(val name: String,

val imageUrl: String,
val desc: String,
val category: String)

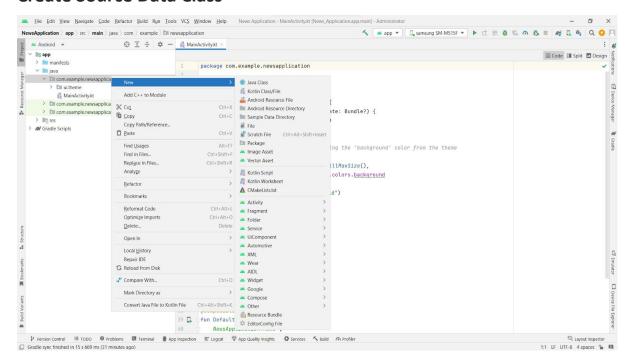
Create News Data Class

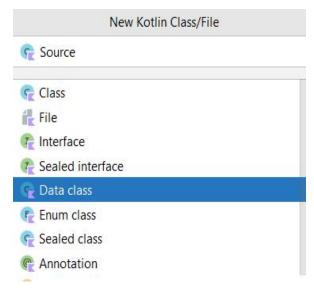




```
package com.example.androidnews
import com.example.androidnews.Articles
import com.google.gson.annotations.SerializedName
data class News(
    @SerializedName("status") var status:String?= null,
    @SerializedName("totalResults") var totalResults : Int? = null,
    @SerializedName("articles") var articles : ArrayList<Articles> =
arrayListOf()
)
```

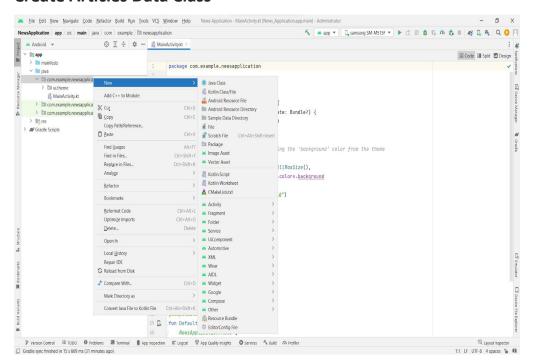
Create Source Data Class

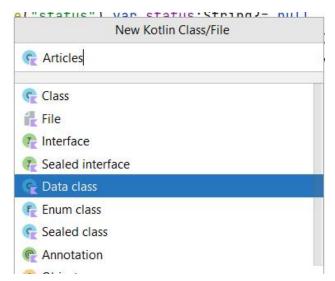




```
package com.example.androidnews
import com.google.gson.annotations.SerializedName
data class Source(
    @SerializedName("id" ) var id : String? = null,
    @SerializedName("name" ) var name : String? = null
)
```

Create Articles Data Class



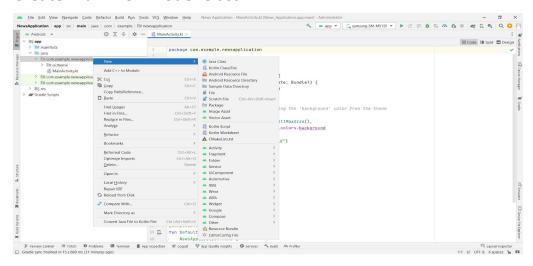


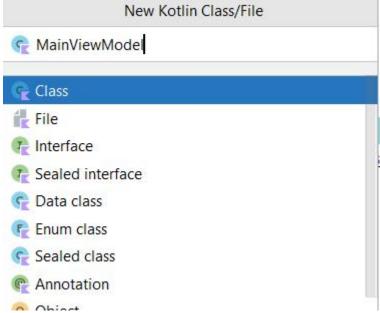
package com.example.androidnews
import com.google.gson.annotations.SerializedName
data class Articles(

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

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

Create MainViewModel Class





package com.example.androidnews

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.androidnews.Articles

import kotlinx.coroutines.launch

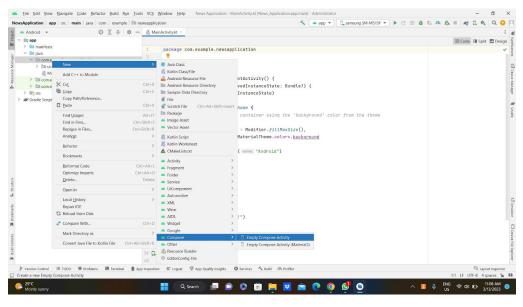
class MainViewModel : ViewModel() {

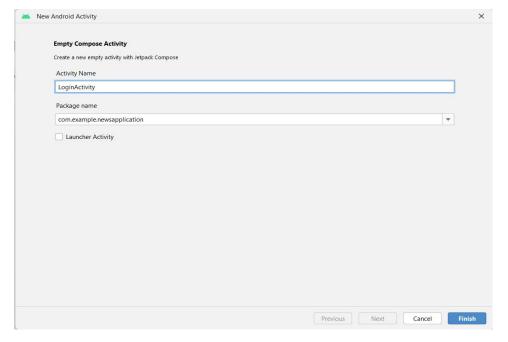
var movieListResponse:List<Articles> by mutableStateOf(listOf())

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()
    }
  }
}
```

Creating LoginActivity.Kt With Database





```
package com.example.newsheadlines

import ...

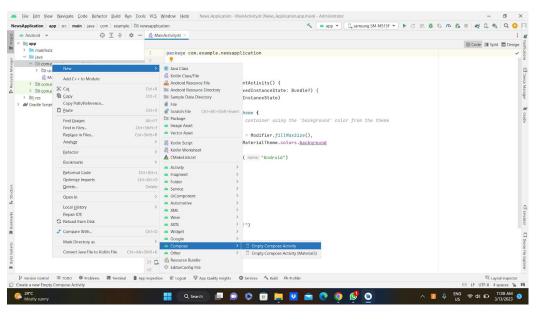
class LoginActivity : ComponentActivity() {
    private lateinit var databaseHelper: UserDatabaseHelper
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        databaseHelper = UserDatabaseHelper(context this)
        setContent {

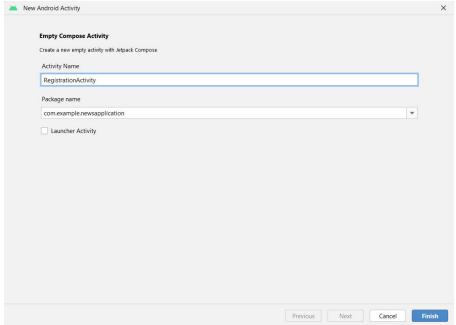
            LoginScreen(context: this, databaseHelper)
        }
    }

@Composable

fun LoginScreen(context: Context, databaseHelper: UserDatabaseHelper) {
        var username by remember { mutableStateOf(value: "") }
        var password by remember { mutableStateOf(value: "") }
        var error by remember { mutableStateOf(value: "") }
}
```

Creating RegistrationActivity.Kt With Database





```
package com.example.newsheadlines

import ...

class RegistrationActivity : ComponentActivity() {
    private lateinit var databaseHelper: UserDatabaseHelper
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        databaseHelper = UserDatabaseHelper( context this)
        setContent {

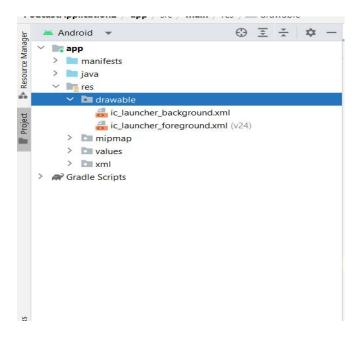
            RegistrationScreen( context this, databaseHelper)
        }
    }

@Composable
fun RegistrationScreen(context: Context, databaseHelper: UserDatabaseHelper) {
        var username by remember { mutableStateOf( value: "") }
        var password by remember { mutableStateOf( value: "") }
        var email by remember { mutableStateOf( value: "") }
        var email by remember { mutableStateOf( value: "") }
        var error by remember { mutableStateOf( value: "") }
}
```

Creating Mainpage.Kt File

In Mainpage.kt file the main application is developed

Before creating UI we need to add some images in drawables which are in res



package com.example.androidnews
import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import androidx.compose.foundation.layout.fillMaxSize
import androidx.compose.material3.Surface
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import android.content.Context
import android.content.Intent
import android.content.Intent

```
import android.util.Log
import android.widget.TextView
import androidx.activity.viewModels
import androidx.compose.material3.CardDefaults
import androidx.compose.material3.CardElevation
import androidx.compose.foundation.lmage
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.material3.Card
import androidx.compose.material3.MaterialTheme
import androidx.compose.material3.Surface
import androidx.compose.material3.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 androidx.compose.ui.tooling.preview.Preview
import com.example.androidnews.ui.theme.AndroidnewsTheme
class MainPage : ComponentActivity() {
  val mainViewModel by viewModels
  override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContent {
      AndroidnewsTheme {
        // A surface container using the 'background' color from the theme
        Surface(color = MaterialTheme.colorScheme.background) {
          Column() {
            Text(text = "Latest NEWS", fontSize = 32.sp, modifier =
Modifier.fillMaxWidth(), textAlign = TextAlign.Center)
            MovieList(applicationContext, movieList =
mainViewModel.movieListResponse)
            mainViewModel.getMovieList()
          } } }}
}
```

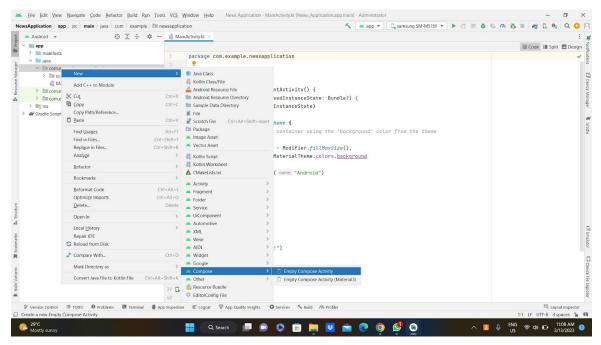
```
@Composable
fun MovieList(context: Context, movieList: List<Articles>) {
  var selectedIndex by remember { mutableStateOf(-1) }
  LazyColumn {
    itemsIndexed(items = movieList) {
        index, item ->
      MovieItem(context, movie = item, index, selectedIndex) { i ->
        selectedIndex = i
      } }}
@Composable
fun Movieltem(context: Context) {
 val movie = Articles(
    "Coco",
    "",
    " articl"
  MovieItem(context, movie = movie, 0, 0) { i ->
    Log.i("wertytest123abc", "MovieItem: "
        +i)}}
@Composable
fun Movieltem(context: Context, movie: Articles, index: Int, selectedIndex: Int,
       onClick: (Int) -> Unit)
{
  val backgroundColor = if (index == selectedIndex)
MaterialTheme.colorScheme.primary else MaterialTheme.colorScheme.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 =
CardDefaults.cardElevation(defaultElevation = 4.dp)
    Surface(color = Color.White) {
      Row(
        Modifier
           .padding(4.dp)
           .fillMaxSize() )
      {
        Image(
           painter = rememberImagePainter(
```

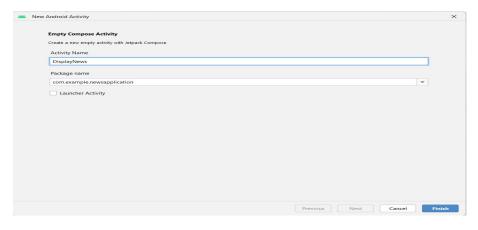
```
builder = {
             scale(Scale.FILL)
             placeholder(R.drawable.placeholder)
             transformations(CircleCropTransformation())
           }
        ),
         contentDescription = movie.description,
         modifier = Modifier
           .fillMaxHeight()
           .weight(0.3f)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

data = movie.urlTolmage,

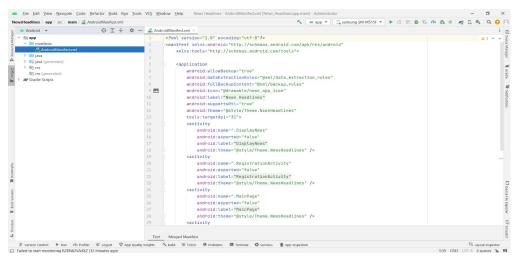
```
update = { it.text = HtmlCompat.fromHtml(html,
HtmlCompat.FROM_HTML_MODE_COMPACT) }
    )
    }
}
```

Creating DisplayNews.Kt File





Modifying AndroidManifest.Xml



When we run the app we will get the MainActivity.kt file as our first screen, but we want LoginActivity.kt, So we need to change in AndroidManifest.xml.

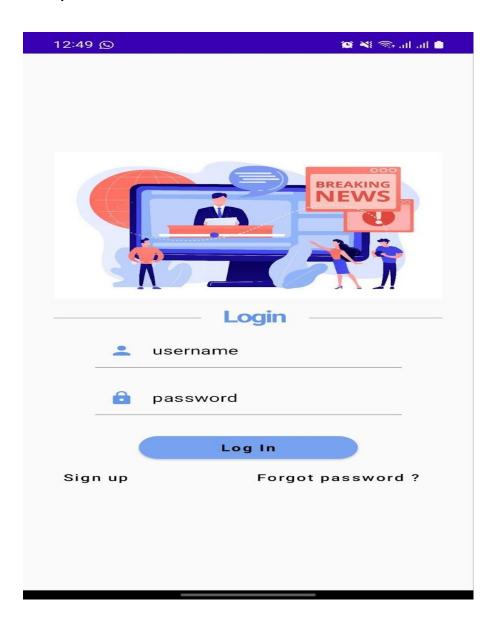
```
AndroidManifest.xml >
               anuroiu.sopporiskii- iroe
               android:theme="@style/Theme.NewsHeadlines"
16
              tools:targetApi="31">
               <activity
                  android:name=".DisplayNews"
19
                  android:exported="false"
                  android:label="DisplayNews"
                  android:theme="@style/Theme.NewsHeadlines" />
                  android:name=".RegistrationActivity"
                  android:exported="false"
                  android:label="RegistrationActivity"
                  android:theme="@style/Theme.NewsHeadlines" />
               <activity
                  android:name=".MainPage"
29
                  android:exported="false"
30
                  android:label="@string/title_activity_main_page"
                  android:theme="@style/Theme.NewsHeadlines" />
               <activity
                   android:name=".LoginActivity"
                   android:exported="true"
                  android:label="News Headlines"
                  android:theme="@style/Theme.NewsHeadlines">
                   <intent-filter>
38
                       <action android:name="android.intent.action.MAIN" />
                      <category android:name="android.intent.category.LAUNCHER" />
                   </intent-filter>
               </activity>
           </application>
      </manifest>
```

Run The Application In Mobile



```
Die List Vew Navigate Code Befactor Build Run Iools VS Window Help News Headlines - LoginActivity's News, Headlines - LoginActivity's Revol. Headlines - Log
```

Output:



Sign Up



- username
- password
- **e**mail

Register

Have an account? Log in



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