

**CHAT CONNECT – A real-time chat and
communication app**
By using android development application

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INTRODUCTION:

Overview:

- Connect Chat is a real-time messaging tool that enables users to chat with individuals and groups, quickly share files, and collaborate on any record by connecting with the right people instantly.
- Connect Chat animates communication around records, Visual Task Boards, topics of interest, or groups of people.

Preview:

- This guide shows you how to extend an app that displays messages to the user and receives the user's replies, such as a chat app, to hand message display and reply receipt off to an Auto device
- Staying connected through messages is important to many drivers.
- Chat apps can let users know if a child needs to be picked up or if a dinner location has been changed.
- The Android framework lets messaging app,s extend their services into the driving experience using a standard user interface that lets.

Problem Definition & Design Thinking:

Empathy Map:

- Let's start with the basics. An *empathy map* is a design tool that is particularly useful in UX design. This method helps you step into the shoes of your target users and understand how they think, feel, and act.
- Using an empathy map, you can paint a picture of your users—and how they engage with products, services, and the world around them. You can also map out the perceptions, motivations, and behaviors that drive their decision.



Ideation & Brainstorming Map:

- down into smaller and smaller concepts. The big idea is like the trunk of a tree, each idea a branch, each sub-idea a smaller branch, and so on down until you get to the twigs and leaves. You can always follow any branch back to get to the main idea.
- We've got a full tutorial on mind mapping, [Mind Mapping 101](#), so if you're not familiar with the concept, you should check it out before continuing. In today's article we're going to look at some of the best mind mapping apps available for both individual users and small teams.




RESULT

First Screen:



Login Page :



A mobile application login screen. At the top, a status bar shows the time 7:04, a settings gear icon, and signal/battery icons. Below this is a blue header bar with a white back arrow and the text "Login". The main content area has a white background and contains two input fields: "Email" and "Password". Below these fields is a red button labeled "Login". The bottom of the screen features a black navigation bar with three icons: a back arrow, a circle, and a square.

7:04 ⚙️

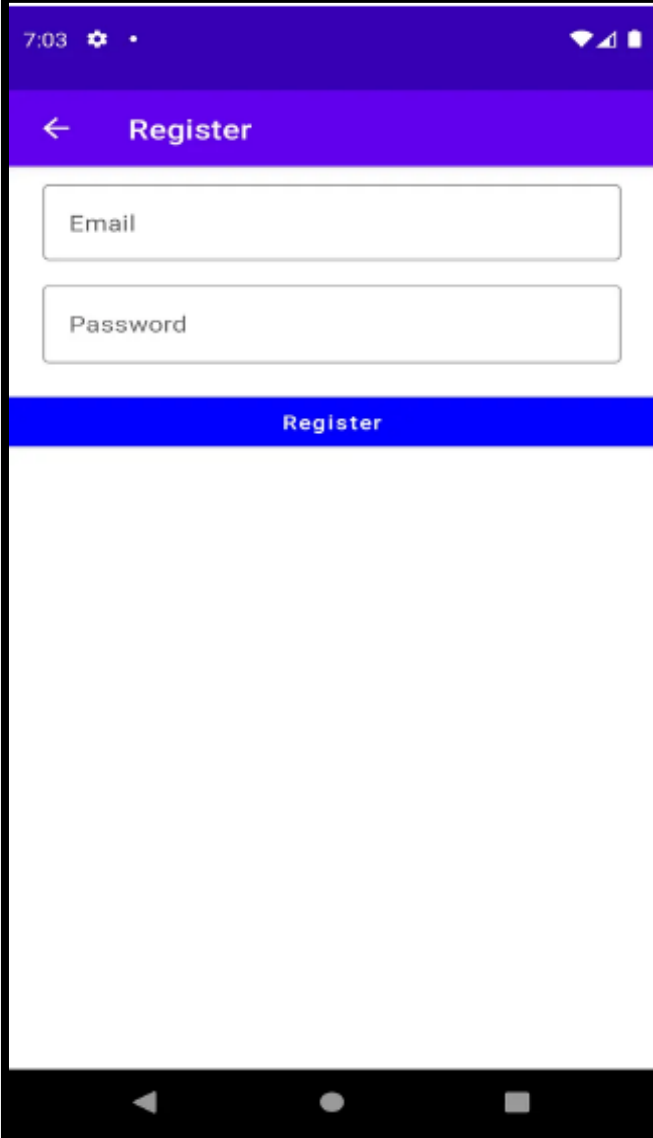
← Login

Email

Password

Login

Register Page :



The image shows a mobile application interface for a registration page. At the top, there is a status bar with the time 7:03, a settings icon, and a battery icon. Below this is a purple header bar with a back arrow icon and the text "Register". The main content area is white and contains two input fields: "Email" and "Password". Below these fields is a blue button labeled "Register". The bottom of the screen features a black navigation bar with three icons: a back arrow, a home circle, and a recent apps square.

7:03

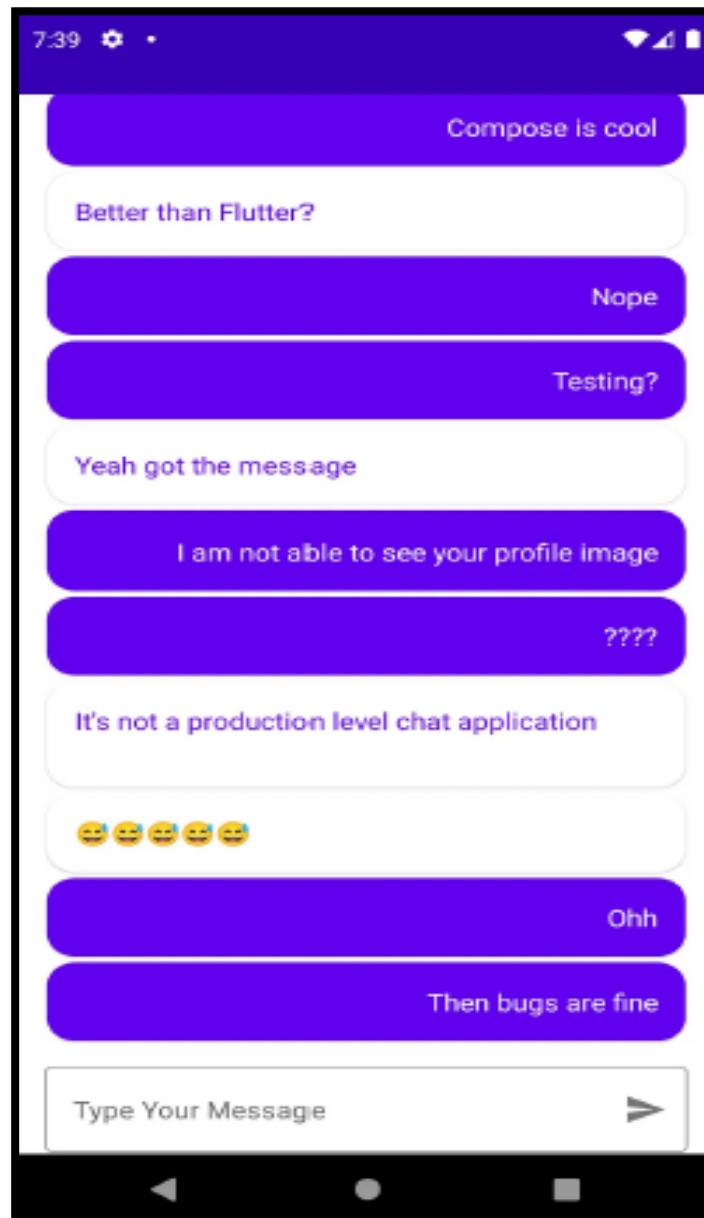
← Register

Email

Password

Register

Home Screen:



ADVANTAGES & DISADVANTAGES

ADVANTAGES:

1. Real-time text preview
2. Clear context
3. File transfer
4. Multilingual support
5. Mobile Messaging Integrations
6. 24/7 support
7. Personal
8. Data security

DISADVANTAGES:

1. The need to be online to offer support
2. Online Trolls
3. Doesn't work well for older demographics

CONCLUSION

- The main objective of the project is to develop a Secure Chat Application. I had taken a wide range of literature review in order to achieve all the tasks.
- As a result, the product has been successfully developed in terms of extendability, portability, and maintainability and tested in order to meet all requirements that are Authentication , Integrity and Confidentiality

FUTURE SCOPE

- ❖ With the knowledge I have gained by developing this application, I am confident that in the future I can make the application more effectively by adding these services.
 - Extending this application by providing Authorization service.
 - Creating Database and maintaining users.
 - Increasing the effectiveness of the application by providing Voice Chat.
 - Extending it to Web Support.

APPENDIX

Source code:

MainActivity.kt file:

```
package com.project.pradyotprakash.flashchat

import android.os.Bundle
import androidx.activity.ComponentActivity
import androidx.activity.compose.setContent
import com.google.firebase.FirebaseApp

/**
 * The initial point of the application from where it gets started.
 *
 * Here we do all the initialization and other things which will be
 * required
 * thought out the application.
 */
class MainActivity : ComponentActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        FirebaseApp.initializeApp(this)
        setContent {
```

```
        NavComposeApp()
    }
}
}
```

Navigation.kt file:

```
package com.project.pradyotprakash.flashchat.nav

import androidx.navigation.NavHostController

import com.project.pradyotprakash.flashchat.nav.Destination.Home
import com.project.pradyotprakash.flashchat.nav.Destination.Login
import com.project.pradyotprakash.flashchat.nav.Destination.Register
```

```
/**
 * A set of destination used in the whole application
 */

object Destination {

    const val AuthenticationOption = "authenticationOption"
    const val Register = "register"
    const val Login = "login"
    const val Home = "home"

}

/**
```

* Set of routes which will be passed to different composable so that

* the routes which are required can be taken.

*/

```
class Action(navController: NavHostController) {
```

```
    val home: () -> Unit = {
```

```
        navController.navigate(Home) {
```

```
            popUpTo(Login) {
```

```
                inclusive = true
```

```
            }
```

```
            popUpTo(Register) {
```

```
                inclusive = true
```

```
            }
```

```
        }
```

```
    }
```

```
    val login: () -> Unit = { navController.navigate(Login) }
```

```
    val register: () -> Unit = {  
navController.navigate(Register) }
```

```
    val navigateBack: () -> Unit = {  
navController.popBackStack() }
```

```
}
```

AuthenticationOption.kt file

```
package com.project.pradyotprakash.flashchat.view
```

```
import androidx.compose.foundation.layout.Arrangement
```

```
import androidx.compose.foundation.layout.Column
```

```
import androidx.compose.foundation.layout.fillMaxHeight
```

```
import androidx.compose.foundation.layout.fillMaxWidth
```

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

```
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
```

```
com.project.pradyotprakash.flashchat.ui.theme.FlashChatTheme
```

```
/**
```

```
 * The authentication view which will give the user an option to  
choose between
```

```
 * login and register.
```

```
*/
```

```
@Composable
```



```

fun AuthenticationView(register: () -> Unit, login: () -> Unit) {
    FlashChatTheme {
        // A surface container using the 'background' color from the
        theme
        Surface(color = MaterialTheme.colors.background) {
            Column(
                modifier = Modifier
                    .fillMaxWidth()
                    .fillMaxHeight(),
                horizontalAlignment = Alignment.CenterHorizontally,
                verticalArrangement = Arrangement.Bottom
            ) {
                Title(title = "🔗 Chat Connect")
                Buttons(title = "Register", onClick = register,
                    backgroundColor = Color.Blue)
                Buttons(title = "Login", onClick = login, backgroundColor
                    = Color.Magenta)
            }
        }
    }
}

```

Widgets.kt:

```
package com.project.pradyotprakash.flashchat.view
```

```
import androidx.compose.foundation.layout.fillMaxHeight
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.foundation.text.KeyboardOptions
import androidx.compose.material.*
import androidx.compose.material.icons.Icons
import androidx.compose.material.icons.filled.ArrowBack
import androidx.compose.runtime.Composable
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.VisualTransformation
import androidx.compose.ui.text.style.TextAlign
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import com.project.pradyotprakash.flashchat.Constants
```

```
/**
```

* Set of widgets/views which will be used throughout the application.

* This is used to increase the code usability.

```
*/
```

```
@Composable
```

```
fun Title(title: String) {
```

```
    Text(
```

```
        text = title,
```

```
        fontSize = 30.sp,
```

```
        fontWeight = FontWeight.Bold,
```

```
        modifier = Modifier.fillMaxHeight(0.5f)
```

```
    )
```

```
}
```

```
// Different set of buttons in this page
```

```
@Composable
```

```
fun Buttons(title: String, onClick: () -> Unit, backgroundColor: Color) {
```

```
    Button(
```

```
        onClick = onClick,
```

```
        colors = ButtonDefaults.buttonColors(
```

```
            backgroundColor = backgroundColor,
```

```
            contentColor = Color.White
```

```
    ),
```

```
    modifier = Modifier.fillMaxWidth(),
```

```
        shape = RoundedCornerShape(0),
    ) {
        Text(
            text = title
        )
    }
}
```

```
@Composable
fun AppBar(title: String, action: () -> Unit) {
    TopAppBar(
        title = {
            Text(text = title)
        },
        navigationIcon = {
            IconButton(
                onClick = action
            ) {
                Icon(
                    imageVector = Icons.Filled.ArrowBack,
                    contentDescription = "Back button"
                )
            }
        }
    )
}
```

```
        }  
    }  
)  
}
```

@Composable

```
fun TextFormField(value: String, onValueChange: (String) -> Unit,  
label: String, keyboardType: KeyboardType, visualTransformation:  
VisualTransformation) {
```

```
    OutlinedTextField(  
        value = value,  
        onValueChange = onValueChange,  
        label = {  
            Text(  
                label  
            )  
        },  
        maxLines = 1,  
        modifier = Modifier  
            .padding(horizontal = 20.dp, vertical = 5.dp)  
            .fillMaxWidth(),  
        keyboardOptions = KeyboardOptions(  
            keyboardType = keyboardType  
        )  
    )  
}
```

```
    ),  
    singleLine = true,  
    visualTransformation = visualTransformation  
)  
}
```

@Composable

```
fun SingleMessage(message: String, isCurrentUser: Boolean) {  
    Card(  
        shape = RoundedCornerShape(16.dp),  
        backgroundColor = if (isCurrentUser)  
            MaterialTheme.colors.primary else Color.White  
    ) {  
        Text(  
            text = message,  
            textAlign =  
                if (isCurrentUser)  
                    TextAlign.End  
                else  
                    TextAlign.Start,  
            modifier = Modifier.fillMaxWidth().padding(16.dp),  
            color = if (! isCurrentUser) MaterialTheme.colors.primary  
                else Color.White  
        )  
    }  
}
```

```
)  
}  
}
```

Home.kt file:

```
package com.project.pradyotprakash.flashchat.view.home
```

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

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

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

```
import androidx.compose.foundation.lazy.items
```

```
import androidx.compose.foundation.text.KeyboardOptions
```

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

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

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

```
import androidx.compose.runtime.Composable
```

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

```
import androidx.compose.runtime.livedata.observeAsState
```

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

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

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

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

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

```
import androidx.lifecycle.viewmodel.compose.viewModel
import com.project.pradyotprakash.flashchat.Constants
import com.project.pradyotprakash.flashchat.view.SingleMessage
```

```
/**
```

```
 * The home view which will contain all the code related to the view
for HOME.
```

```
 *
```

```
 * Here we will show the list of chat messages sent by user.
```

```
 * And also give an option to send a message and logout.
```

```
 */
```

```
@Composable
```

```
fun HomeView(
```

```
    homeViewModel: HomeViewModel = viewModel()
```

```
) {
```

```
    val message: String by
homeViewModel.message.observeAsState(initial = "")
```

```
    val messages: List<Map<String, Any>> by
homeViewModel.messages.observeAsState(
        initial = emptyList<Map<String, Any>>().toMutableList()
    )
```

```
Column(
```



```

modifier = Modifier.fillMaxSize(),
horizontalAlignment = Alignment.CenterHorizontally,
verticalArrangement = Arrangement.Bottom
) {
    LazyColumn(
        modifier = Modifier
            .fillMaxWidth()
            .weight(weight = 0.85f, fill = true),
        contentPadding = PaddingValues(horizontal = 16.dp,
vertical = 8.dp),
        verticalArrangement = Arrangement.spacedBy(4.dp),
        reverseLayout = true
    ) {
        items(messages) { message ->
            val isCurrentUser =
message[Constants.IS_CURRENT_USER] as Boolean

            SingleMessage(
                message = message[Constants.MESSAGE].toString(),
                isCurrentUser = isCurrentUser
            )
        }
    }
}

```

```
OutlinedTextField(
  value = message,
  onValueChange = {
    homeViewModel.updateMessage(it)
  },
  label = {
    Text(
      "Type Your Message"
    )
  },
  maxLines = 1,
  modifier = Modifier
    .padding(horizontal = 15.dp, vertical = 1.dp)
    .fillMaxWidth()
    .weight(weight = 0.09f, fill = true),
  keyboardOptions = KeyboardOptions(
    keyboardType = KeyboardType.Text
  ),
  singleLine = true,
  trailingIcon = {
    IconButton(
      onClick = {
```

```
        homeViewModel.addMessage()
    }
) {
    Icon(
        imageView = Icons.Default.Send,
        contentDescription = "Send Button"
    )
}
}
)
```

HomeViewModel class:

```
package com.project.pradyotprakash.flashchat.view.home
```

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

```
import androidx.lifecycle.LiveData
```

```
import androidx.lifecycle.MutableLiveData
```

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

```
import com.google.firebase.auth.ktx.auth
```

```
import com.google.firebase.firestore.ktx.firestore
```

```
import com.google.firebase.ktx.Firebase
```

```
import com.project.pradyotprakash.flashchat.Constants
```

```
import java.lang.IllegalArgumentException
```

```
/**
```

```
 * Home view model which will handle all the logic related to  
 HomeView
```

```
*/
```

```
class HomeViewModel : ViewModel() {
```

```
    init {
```

```
        getMessages()
```

```
    }
```

```
    private val _message = MutableLiveData("")
```

```
    val message: LiveData<String> = _message
```

```
    private var _messages =
```

```
    MutableLiveData(emptyList<Map<String, Any>>().toMutableList())
```

```
    val messages: LiveData<MutableList<Map<String, Any>>> =  
    _messages
```

```
/**
```

```
 * Update the message value as user types
```

```
*/
```

```
fun updateMessage(message: String) {
```

```

        _message.value = message
    }

    /**
     * Send message
     */
    fun addMessage() {
        val message: String = _message.value ?: throw
        IllegalArgumentException("message empty")

        if (message.isNotEmpty()) {

            Firebase.firestore.collection(Constants.MESSAGES).document().set(
                hashMapOf(
                    Constants.MESSAGE to message,
                    Constants.SENT_BY to
                        Firebase.auth.currentUser?.uid,
                    Constants.SENT_ON to System.currentTimeMillis()
                )
            ).addOnSuccessListener {
                _message.value = ""
            }
        }
    }
}

```

```

/**
 * Get the messages
 */
private fun getMessages() {
    Firebase.firestore.collection(Constants.MESSAGES)
        .orderBy(Constants.SENT_ON)
        .addSnapshotListener { value, e ->
            if (e != null) {
                Log.w(Constants.TAG, "Listen failed.", e)
                return@addSnapshotListener
            }

            val list = emptyList<Map<String, Any>>().toMutableList()

            if (value != null) {
                for (doc in value) {
                    val data = doc.data
                    data[Constants.IS_CURRENT_USER] =
                        Firebase.auth.currentUser?.uid.toString() ==
data[Constants.SENT_BY].toString()

                    list.add(data)
                }
            }
        }
}

```

```

        }
    }

    updateMessages(list)
}

/**
 * Update the list after getting the details from firestore
 */
private fun updateMessages(list: MutableList<Map<String,
Any>>) {
    _messages.value = list.asReversed()
}
}

```

Login.kt file:

```
package com.project.pradyotprakash.flashchat.view.login
```

```

import androidx.compose.foundation.layout.*
import androidx.compose.material.CircularProgressIndicator
import androidx.compose.runtime.Composable
import androidx.compose.runtime.getValue
import androidx.compose.runtime.livedata.observeAsState

```

```
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.input.KeyboardType
import
androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.text.input.VisualTransformation
import androidx.compose.ui.unit.dp
import androidx.lifecycle.viewmodel.compose.viewModel
import com.project.pradyotprakash.flashchat.view.Appbar
import com.project.pradyotprakash.flashchat.view.Buttons
import com.project.pradyotprakash.flashchat.view.TextFormField
```

```
/**
```

```
 * The login view which will help the user to authenticate
themselves and go to the
```

```
 * home screen to show and send messages to others.
```

```
*/
```

```
@Composable
```

```
fun LoginView(
```

```
    home: () -> Unit,
```

```
    back: () -> Unit,
```



```
loginViewModel: LoginViewModel = viewModel()
) {
    val email: String by loginViewModel.email.observeAsState("")
    val password: String by
loginViewModel.password.observeAsState("")
    val loading: Boolean by
loginViewModel.loading.observeAsState(initial = false)
```

```
Box(
    contentAlignment = Alignment.Center,
    modifier = Modifier.fillMaxSize()
) {
    if (loading) {
        CircularProgressIndicator()
    }
    Column(
        modifier = Modifier.fillMaxSize(),
        horizontalAlignment = Alignment.CenterHorizontally,
        verticalArrangement = Arrangement.Top
    ) {
        AppBar(
            title = "Login",
            action = back
```

)

TextFormField(

value = email,

onValueChange = { loginViewModel.updateEmail(it) },

label = "Email",

keyboardType = KeyboardType.Email,

visualTransformation = VisualTransformation.None

)

TextFormField(

value = password,

onValueChange = { loginViewModel.updatePassword(it)

},

label = "Password",

keyboardType = KeyboardType.Password,

visualTransformation = PasswordVisualTransformation()

)

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

Buttons(

title = "Login",

onClick = { loginViewModel.loginUser(home = home) },

backgroundColor = Color.Magenta

)

}

```
}  
}
```

LoginViewModel class:

```
package com.project.pradyotprakash.flashchat.view.login
```

```
import androidx.lifecycle.LiveData
```

```
import androidx.lifecycle.MutableLiveData
```

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

```
import com.google.firebase.auth.FirebaseAuth
```

```
import com.google.firebase.auth.ktx.auth
```

```
import com.google.firebase.ktx.Firebase
```

```
import java.lang.IllegalArgumentException
```

```
/**
```

```
 * View model for the login view.
```

```
*/
```

```
class LoginViewModel : ViewModel() {
```

```
    private val auth: FirebaseAuth = Firebase.auth
```

```
    private val _email = MutableLiveData("")
```

```
    val email: LiveData<String> = _email
```

```
private val _password = MutableLiveData("")
val password: LiveData<String> = _password
```

```
private val _loading = MutableLiveData(false)
val loading: LiveData<Boolean> = _loading
```

```
// Update email
```

```
fun updateEmail(newEmail: String) {
    _email.value = newEmail
}
```

```
// Update password
```

```
fun updatePassword(newPassword: String) {
    _password.value = newPassword
}
```

```
// Register user
```

```
fun loginUser(home: () -> Unit) {
    if (_loading.value == false) {
        val email: String = _email.value ?: throw
        IllegalArgumentException("email expected")
        val password: String =
```

```
        _password.value ?: throw  
        IllegalArgumentException("password expected")
```

```
        _loading.value = true
```

```
        auth.signInWithEmailAndPassword(email, password)
```

```
        .addOnCompleteListener {
```

```
            if (it.isSuccessful) {
```

```
                home()
```

```
            }
```

```
            _loading.value = false
```

```
        }
```

```
    }
```

```
}
```

```
}
```

Register.kt file

```
package com.project.pradyotprakash.flashchat.view.register
```

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

```
import androidx.compose.material.CircularProgressIndicator
```

```
import androidx.compose.runtime.Composable
```

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

```
import androidx.compose.runtime.livedata.observeAsState
```

```
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.input.KeyboardType
import
androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.text.input.VisualTransformation
import androidx.compose.ui.unit.dp
import androidx.lifecycle.viewmodel.compose.viewModel
import com.project.pradyotprakash.flashchat.view.Appbar
import com.project.pradyotprakash.flashchat.view.Buttons
import com.project.pradyotprakash.flashchat.view.TextFormField
```

```
/**
```

```
 * The Register view which will be helpful for the user to register
themselves into
```

```
 * our database and go to the home screen to see and send
messages.
```

```
*/
```

```
@Composable
```

```
fun RegisterView(
    home: () -> Unit,
    back: () -> Unit,
```

```
registerViewModel: RegisterViewModel = viewModel()
) {
    val email: String by registerViewModel.email.observeAsState("")
    val password: String by
registerViewModel.password.observeAsState("")
    val loading: Boolean by
registerViewModel.loading.observeAsState(initial = false)
```

```
Box(
    contentAlignment = Alignment.Center,
    modifier = Modifier.fillMaxSize()
) {
    if (loading) {
        CircularProgressIndicator()
    }
    Column(
        modifier = Modifier.fillMaxSize(),
        horizontalAlignment = Alignment.CenterHorizontally,
        verticalArrangement = Arrangement.Top
    ) {
        AppBar(
            title = "Register",
            action = back
```

)

TextFormField(

value = email,

onValueChange = { registerViewModel.updateEmail(it) },

label = "Email",

keyboardType = KeyboardType.Email,

visualTransformation = VisualTransformation.None

)

TextFormField(

value = password,

onValueChange = {
registerViewModel.updatePassword(it) },

label = "Password",

keyboardType = KeyboardType.Password,

visualTransformation = PasswordVisualTransformation()

)

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

Buttons(

title = "Register",

onClick = { registerViewModel.registerUser(home =
home) },

backgroundColor = Color.Blue

)


```
    }  
    }  
}
```

RegisterViewModel class:

```
package com.project.pradyotprakash.flashchat.view.register
```

```
import androidx.lifecycle.LiveData  
import androidx.lifecycle.MutableLiveData  
import androidx.lifecycle.ViewModel  
import com.google.firebase.auth.FirebaseAuth  
import com.google.firebase.auth.ktx.auth  
import com.google.firebase.ktx.Firebase  
import java.lang.IllegalArgumentException
```

```
/**
```

```
 * View model for the login view.
```

```
*/
```

```
class RegisterViewModel : ViewModel() {  
    private val auth: FirebaseAuth = Firebase.auth  
  
    private val _email = MutableLiveData("")  
    val email: LiveData<String> = _email
```

```
private val _password = MutableLiveData("")
val password: LiveData<String> = _password
```

```
private val _loading = MutableLiveData(false)
val loading: LiveData<Boolean> = _loading
```

```
// Update email
```

```
fun updateEmail(newEmail: String) {
    _email.value = newEmail
}
```

```
// Update password
```

```
fun updatePassword(newPassword: String) {
    _password.value = newPassword
}
```

```
// Register user
```

```
fun registerUser(home: () -> Unit) {
    if (_loading.value == false) {
        val email: String = _email.value ?: throw
        IllegalArgumentException("email expected")
        val password: String =
```

```
        _password.value ?: throw  
        IllegalArgumentException("password expected")
```

```
        _loading.value = true
```

```
        auth.createUserWithEmailAndPassword(email, password)
```

```
        .addOnCompleteListener {
```

```
            if (it.isSuccessful) {
```

```
                home()
```

```
            }
```

```
            _loading.value = false
```

```
        }
```

```
    }
```

```
}
```

```
}
```

