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Online Voting System

Objective of Application

The main motive behind designing this application “Online Voting System” is to build an easy-to-use, user-friendly, and safe platform for holding elections. Through online registration, login, and voting, this service enables users to take part in the electoral process. It also gives users the option to select the candidates or options they want to support. In addition, we develop a digital platform in this application that dispenses with the necessity for paper ballots and enables remote election participation.

Intended Users

- User/Voter

Data Flow Diagram

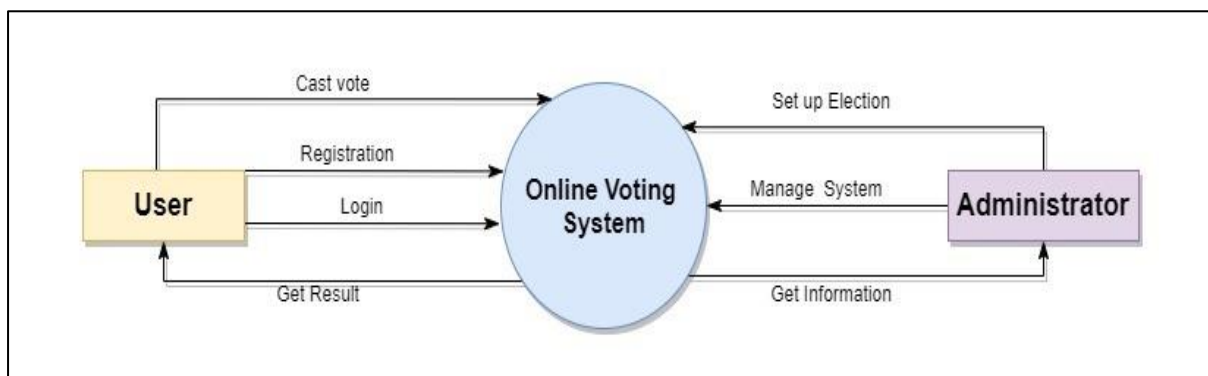


Figure 1. Data Flow Diagram-A

Sequence Diagram

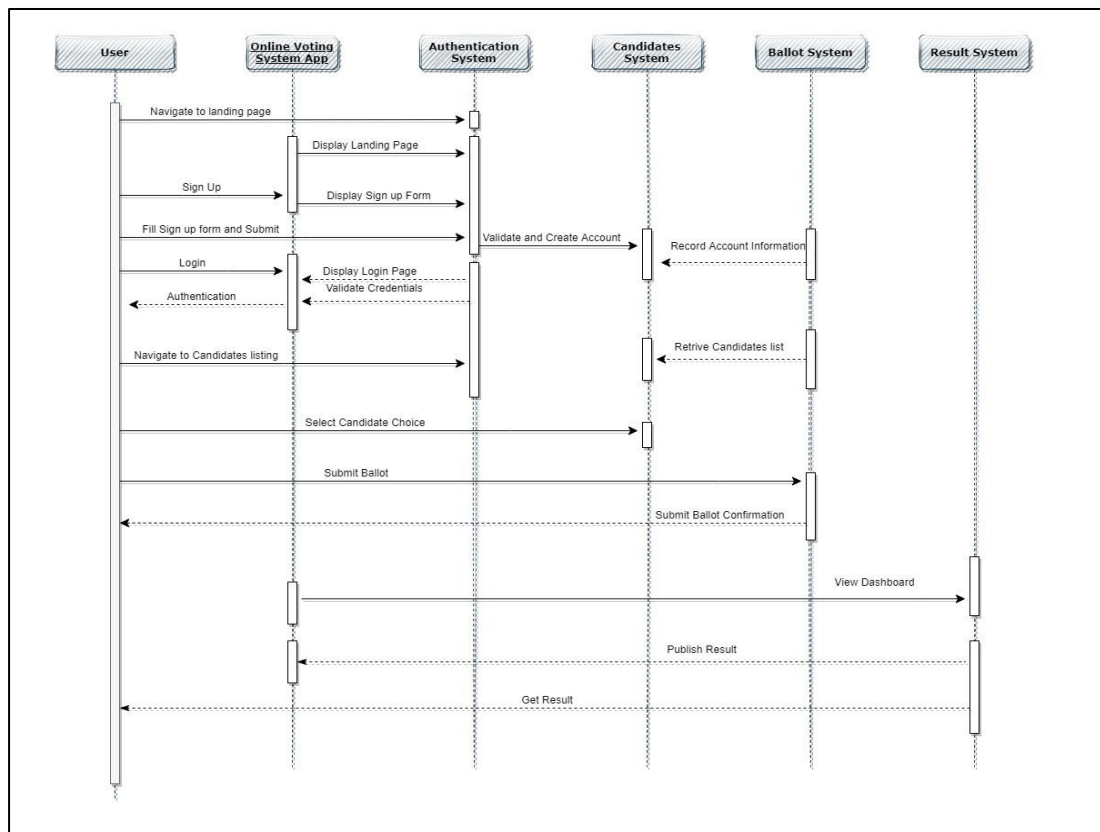


Figure 2. Sequence Diagram

Software Design Decisions

Developed in Java and built using Android Studio, this application was initially tested on an emulator, a virtual Android device. An emulator served as the testing ground for this Java application built with Android Studio.

Layout: The app uses a scroll view with a linear layout to ensure that all the widgets and text are displayed correctly on various screen sizes.

Navigation: A top app bar and a bottom navigation bar are used consistently throughout the app. The navigation bars for students and tutors are slightly different because they have a different number of icons.

User Experience: The app prioritizes the student user experience because students have more functionalities to use in the app. Some features for tutors, like a calendar and notes section, are planned for future development.

Libraries Used and Code

```
package com.voting.appClass

import android.app.Application

class AppClass : Application() {
    companion object {
        val list = arrayListOf<String>().apply {
            add("Conservative and Unionist Party")
            add("Labour Party")
            add("Liberal Democrats")
            add("Green Party of England and Wales")
            add("Brexit Party")
            add("Independent")
            add("Scottish National Party")
            add("UKIP")
            add("Plaid Cymru")
            add("Yorkshire Party")
            add("Christian Peoples Alliance")
            add("Official Monster Raving Loony Party")
            add("Scottish Green Party")
            add("Social Democratic Party")
            add("Liberal Party")
            add("Alliance Party of Northern Ireland")
        }
    }
}
```

Figure 3AppClassLibraries and Used Code

```
package com.voting.routing

import androidx.compose.runtime.Composable
import androidx.navigation.compose.NavHost
import androidx.navigation.compose.composable
import androidx.navigation.compose.rememberNavController
import com.voting.ui.login.LoginScreen
import com.voting.ui.main.MainScreen
import com.voting.ui.register.RegisterScreen
import com.voting.ui.result.ResultScreen
import com.voting.ui.splash.SplashScreen

@Composable
fun Navigation() {
    val navController = rememberNavController()

    NavHost(
        navController = navController,
        startDestination = Screen.SplashScreen.route
    ) {
        composable(route = Screen.SplashScreen.route) {
            SplashScreen(navController = navController)
        }
        composable(route = Screen.LoginScreen.route) {
            LoginScreen(navController = navController)
        }
        composable(route = Screen.RegisterScreen.route) {
            RegisterScreen(navController = navController)
        }
        composable(route = Screen.MainScreen.route) {
            MainScreen(navController = navController)
        }
        composable(route = Screen.ResultScreen.route) {
            ResultScreen(navController = navController)
        }
    }
}
```

Figure 4Navigationrouting Libraries and Used Code

```

package com.voting.routing

sealed class Screen(val route: String) {

    object SplashScreen: Screen("splash_screen")
    object LoginScreen: Screen("login_screen")
    object RegisterScreen: Screen("register_screen")
    object MainScreen: Screen("main_screen")
    object ResultScreen: Screen("result_screen")

}

```

Figure 5ScreenroutingLibraries Used and Code

```

package com.voting.ui.login

import android.annotation.SuppressLint
import android.util.Log
import android.widget.Toast
import androidx.compose.foundation.*
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.ExperimentalComposeUiApi
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.text.TextStyle
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.compose.ui.window.Dialog
import androidx.compose.ui.window.DialogProperties
import androidx.navigation.NavController
import com.google.firebase.auth.FirebaseAuth
import com.google.firebase.firestore.ktx.firestore
import com.google.firebase.ktx.Firebase
import com.voting.R
import com.voting.routing.Screen
import com.voting.ui.localDatabase.VotingLocalDataBase
import com.voting.ui.theme.VotingAppTheme
import com.voting.ui.theme.purple
import com.voting.ui.theme.white
import com.voting.utils.BorderButton
import com.voting.utils.RoundedBackgroundButton
import com.voting.utils.isValidEmail

@OptIn(ExperimentalMaterial3Api::class, ExperimentalComposeUiApi::class)
@SuppressLint("UnusedMaterial3ScaffoldPaddingParameter")
@Composable
fun LoginScreen(navController: NavController) {
    val scrollState = rememberScrollState()
    val context = LocalContext.current
    val preferenceManager = remember {
        VotingLocalDataBase(context)
    }
}

```

Figure 6LoginScreen UI Libraries and Used Code

```

package com.voting.ui.main

import android.annotation.SuppressLint
import androidx.compose.foundation.*
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material.rememberScaffoldState
import androidx.compose.material3.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.ExperimentalComposeUiApi
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.res.stringResource
import androidx.compose.ui.text.SpanStyle
import androidx.compose.ui.text.TextStyle
import androidx.compose.ui.text.buildAnnotatedString
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.withStyle
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.navigation.NavController
import com.voting.R
import com.voting.appClass.AppClass.Companion.list
import com.voting.routing.Screen
import com.voting.ui.drawer.DrawerBody
import com.voting.ui.drawer.DrawerHeader
import com.voting.ui.drawer.TopBar
import com.voting.ui.localDatabase.VotingLocalDataBase
import com.voting.ui.model.CandidateModel
import com.voting.ui.theme.VotingAppTheme
import com.voting.ui.theme.purple
import com.voting.ui.theme.white
import com.voting.utils.RoundedBackgroundButton
import kotlinx.coroutines.launch

@OptIn(ExperimentalMaterial3Api::class, ExperimentalComposeUiApi::class)
@SuppressLint("UnusedMaterial3ScaffoldPaddingParameter", "UnrememberedMutableState")
@Composable
fun mainScreen(navController: NavController) {
    val context = LocalContext.current
    val preferenceManager = remember {
        VotingLocalDataBase(context)
    }
}

```

Figure 7 MainScreen UI Libraries and Used Code

```

package com.voting.ui.register

import android.annotation.SuppressLint
import android.widget.Toast
import androidx.compose.foundation.*
import androidx.compose.foundation.layout.*
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.*
import androidx.compose.runtime.*
import androidx.compose.ui.Alignment
import androidx.compose.ui.ExperimentalComposeUiApi
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.layout.ContentScale
import androidx.compose.ui.platform.LocalContext
import androidx.compose.ui.res.painterResource
import androidx.compose.ui.text.TextStyle
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.PasswordVisualTransformation
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import androidx.compose.ui.window.Dialog
import androidx.compose.ui.window.DialogProperties
import androidx.navigation.NavController
import com.google.firebase.auth.FirebaseAuth
import com.google.firebase.firestore.ktx.firestore
import com.google.firebase.ktx.Firebase
import com.voting.R
import com.voting.routing.Screen
import com.voting.ui.localDatabase.VotingLocalDataBase
import com.voting.ui.theme.VotingAppTheme
import com.voting.ui.theme.purple
import com.voting.ui.theme.white
import com.voting.utils.BorderButton
import com.voting.utils.RoundedBackgroundButton
import com.voting.utils.isValidEmail

@OptIn(ExperimentalMaterial3Api::class, ExperimentalComposeUiApi::class)
@SuppressLint("UnusedMaterial3ScaffoldPaddingParameter")
@Composable
fun RegisterScreen(navController: NavController) {
    val context = LocalContext.current
    val preferenceManager = remember {
        VotingLocalDataBase(context)
    }
    var isRegisterVoter by remember { mutableStateOf(false) }
    var name by remember { mutableStateOf("") }
    var email by remember { mutableStateOf("") }
    var password by remember { mutableStateOf("") }
    val firebaseAuth = FirebaseAuth.getInstance()
    VotingAppTheme {
        Scaffold {

```

Figure 8 RegisterScreen UI Libraries and Used Code

```

package com.voting.utils

import androidx.compose.foundation.clickable
import androidx.compose.foundation.focusable
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.foundation.text.KeyboardActions
import androidx.compose.foundation.text.KeyboardOptions
import androidx.compose.material3.*
import androidx.compose.runtime.Composable
import androidx.compose.ui.ExperimentalComposeUiApi
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.platform.LocalSoftwareKeyboardController
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.text.input.KeyboardCapitalization
import androidx.compose.ui.text.input.KeyboardType
import androidx.compose.ui.text.input.VisualTransformation
import androidx.compose.ui.unit.Dp
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import com.voting.ui.theme.purple

@OptIn(ExperimentalMaterial3Api::class, ExperimentalComposeUiApi::class)
@Composable
fun BorderButton(
    value: String,
    placeholder: String,
    onChange: (String) -> Unit,
    onClick: () -> Unit = {},
    isEnabled: Boolean = true,
    readOnly: Boolean = false,
    keyboardType: KeyboardType = KeyboardType.Text,
    keyboardCapitalization: KeyboardCapitalization = KeyboardCapitalization.Sentences,
    visualTransformation: VisualTransformation = VisualTransformation.None,
    leadingIcon: @Composable (() -> Unit)? = null,
    trailingIcon: @Composable (() -> Unit)? = null,
    horizontalPadding : Dp = 0.dp,
    verticalPadding : Dp = 3.dp,
    colors : TextFieldColors? = null,
    label : @Composable (() -> Unit)? = null,
) {
    val keyboardController = LocalSoftwareKeyboardController.current

    OutlinedTextField(
        value = value,
        shape = RoundedCornerShape(10.dp),
        keyboardOptions = KeyboardOptions(keyboardType = keyboardType, capitalization = keyboardCapitalization),
        keyboardActions = KeyboardActions(
            onDone = {keyboardController?.hide()}),
        visualTransformation = visualTransformation,
        enabled = isEnabled,

```

Figure 9BorderButtonutils Libraries and Used Code

```

package com.voting.utils

import java.util.regex.Pattern

fun isValidEmail(s: String): Boolean {
    val emailPattern = ("^((\\w-|\\.)+[\\w-]|([a-zA-Z]{1}|[\\w-]{2,}))@"
        + "(((\\[0-1]?[0-9]{1,2}|25[0-5]|2[0-4][0-9]))\\.((\\[0-1]?
        + "[0-9]{1,2}|25[0-5]|2[0-4][0-9]))\\.
        + "((\\[0-1]?[0-9]{1,2}|25[0-5]|2[0-4][0-9]))\\.((\\[0-1]?
        + "[0-9]{1,2}|25[0-5]|2[0-4][0-9])){1}|"
        + "([a-zA-Z]+[\\w-|\\.]+[a-zA-Z]{2,4})$")
    val pattern = Pattern.compile(emailPattern)
    val matcher = pattern.matcher(s)

    return !matcher.matches()
}

```

Figure 10 Extensionutils Libraries and Used Code

```

package com.voting.utils

import androidx.compose.foundation.background
import androidx.compose.foundation.layout.Box
import androidx.compose.foundation.layout.PaddingValues
import androidx.compose.foundation.layout.fillMaxWidth
import androidx.compose.foundation.layout.padding
import androidx.compose.foundation.shape.RoundedCornerShape
import androidx.compose.material3.Button
import androidx.compose.material3.ButtonDefaults
import androidx.compose.material3.Text
import androidx.compose.runtime.Composable
import androidx.compose.ui.Alignment
import androidx.compose.ui.Modifier
import androidx.compose.ui.graphics.Brush
import androidx.compose.ui.graphics.Color
import androidx.compose.ui.text.font.FontWeight
import androidx.compose.ui.unit.dp
import androidx.compose.ui.unit.sp
import com.voting.ui.theme.purple

@Composable
fun RoundedBackgroundButton(text: String, isEnabled: Boolean = true, onClick: () -> Unit, textColor: Color = Color.White) {
    GradientButton(
        onClick = onClick,
        modifier = Modifier.padding(vertical = 5.dp).fillMaxWidth(),
        textColor = textColor,
        isEnabled = isEnabled,
        gradient = Brush.horizontalGradient(listOf(purple, purple)),
        text = text
    )
}

@Composable
fun GradientButton(
    text: String,
    gradient: Brush,
    modifier: Modifier = Modifier,
    onClick: () -> Unit = {},
    textColor: Color,
    isEnabled: Boolean
) {
    Button(
        modifier = modifier,
        colors = ButtonDefaults.buttonColors(containerColor = Color.Transparent, contentColor = textColor),
        contentPadding = PaddingValues(),
        shape = RoundedCornerShape(30.dp),
        enabled = isEnabled,
        onClick = { onClick() },
    ) {
        Text(

```

Figure 11 RoundedButtonutils Libraries and Used Code

Social, Legal, Ethical and Security Issues

Social Issues

Voter Integration and Inclusion

For guaranteed fairness in the political process, online voting systems mobile applications have to address gaps in internet access and digital knowledge.

Trust in the Democratic Process

The trust of the Voters that their ballots will be cast, counted, and that the election results will fairly represent the electorate must be increased by the online voting system mobile application.

Involvement of the Community

A mobile application for an online voting system should promote civic engagement and involvement by providing clear and simple voting procedures that boost voter turnout.

Legal Issues

Electoral Laws

The Online Voting System Mobile Application should abide by the electoral laws and regulations that each jurisdiction has governing voter eligibility, registration processes, election administration, and campaign finance according to **Electoral Law of UK**.

Voter Authentication

The secure identification procedures should be implemented by the online voting system mobile application to confirm voter identities and stop fraudulent or duplicate voting by **Identity Verification Act**.

Ethical Issues

Transparent Objectivity

Voter identity verification, vote recording and counting, and election results audits are all part of the online voting process that the Online Voting System Mobile Application aims to make transparently.

Accountability

The goal of the online voting system mobile application should be to hold election authorities and administrators responsible for their choices and actions by putting in place systems for accountability and oversight.

Impartiality

Maintaining impartiality and fairness in the administration of the online voting platform, including the choice of candidates, the holding of elections, and the settlement of disputes, should be the goal of the Online Voting System Mobile Application.

Security Issues

Secure and Encrypted Transmission

To avoid eavesdropping or manipulation during transmission over the internet, voter data and election results must be encrypted in the Online Voting System Mobile Application.

Safeguarding in Authentication

Strong authentication procedures should be implemented by the online voting system mobile application to guard against illegal access to voting systems, confirm voter's identities, and maintain the accuracy of voter registration databases.

Security of the Data

To ensure the availability, confidentiality, and integrity of voter data, system infrastructure, and election results, the Online Voting System Mobile Application should implement strong and effective security measures.

Development Strategy

In agile methodology, I have created four sprint task to be done and the development of this application is based on the Product backlogs

Phases

Sprint App Objective

In this Sprint App Objective, the goal that need to be achieved are mentioned-

➔ Sprint App Objective

- I. Fundamental Requirement of the Online Voting System Application
- II. Development of Online Voting System Application
- III. GIT Deployment, Code Development and Database schema
- IV. Testing, UAT and Documentations

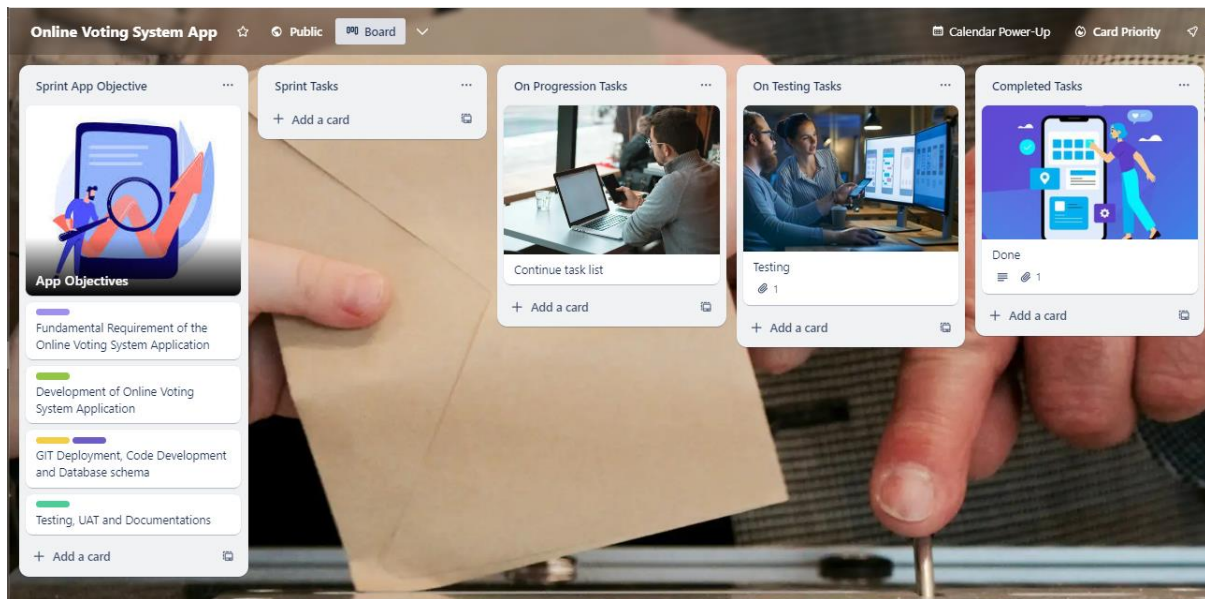


Figure 12. Sprint App

Phase-1

The four sprints are used to divide the development this online voting system application.

- ➔ Sprint-1 Requirement Gathering
- ➔ Sprint-2 Wire Frame with UI & UX
- ➔ Sprint-3 Coding, Git Repository for Version Control of UI design, Database schema
- ➔ Sprint-4 Testing of mobile App, Deployment, UAT & Documentation

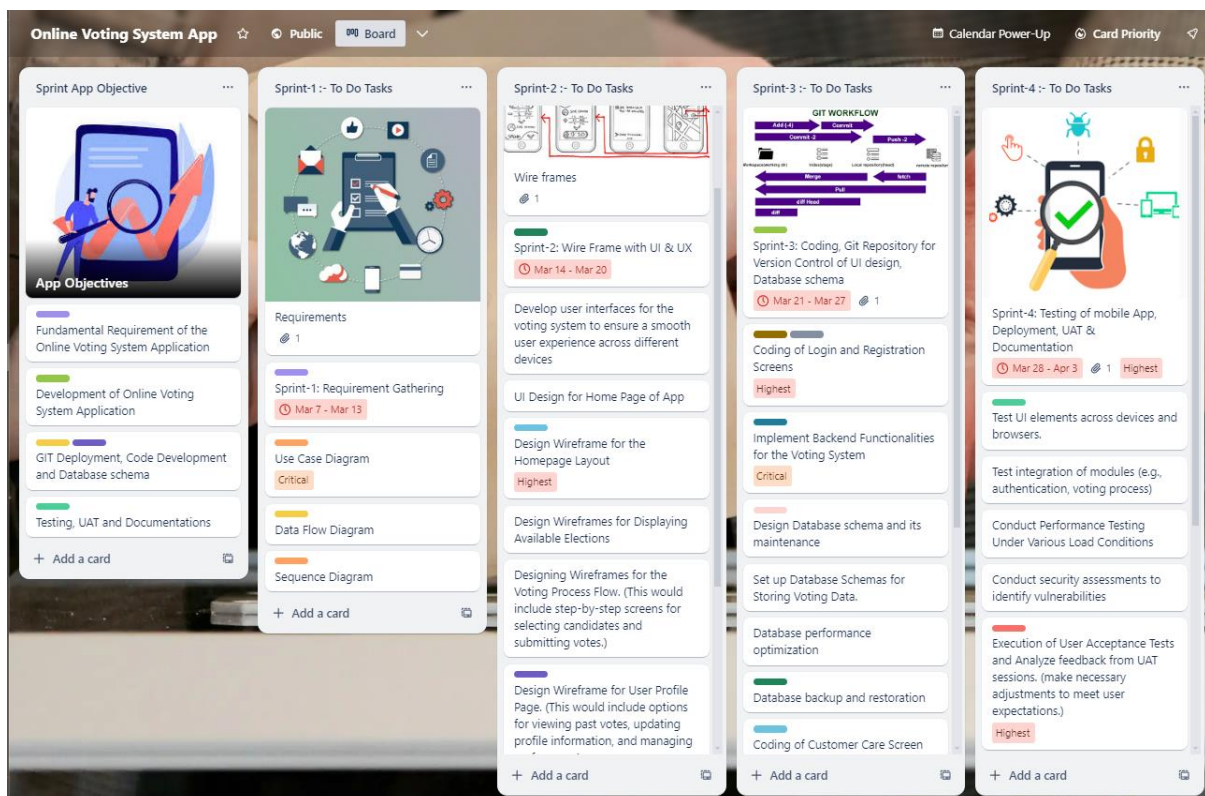


Figure 13. Phase I (i)

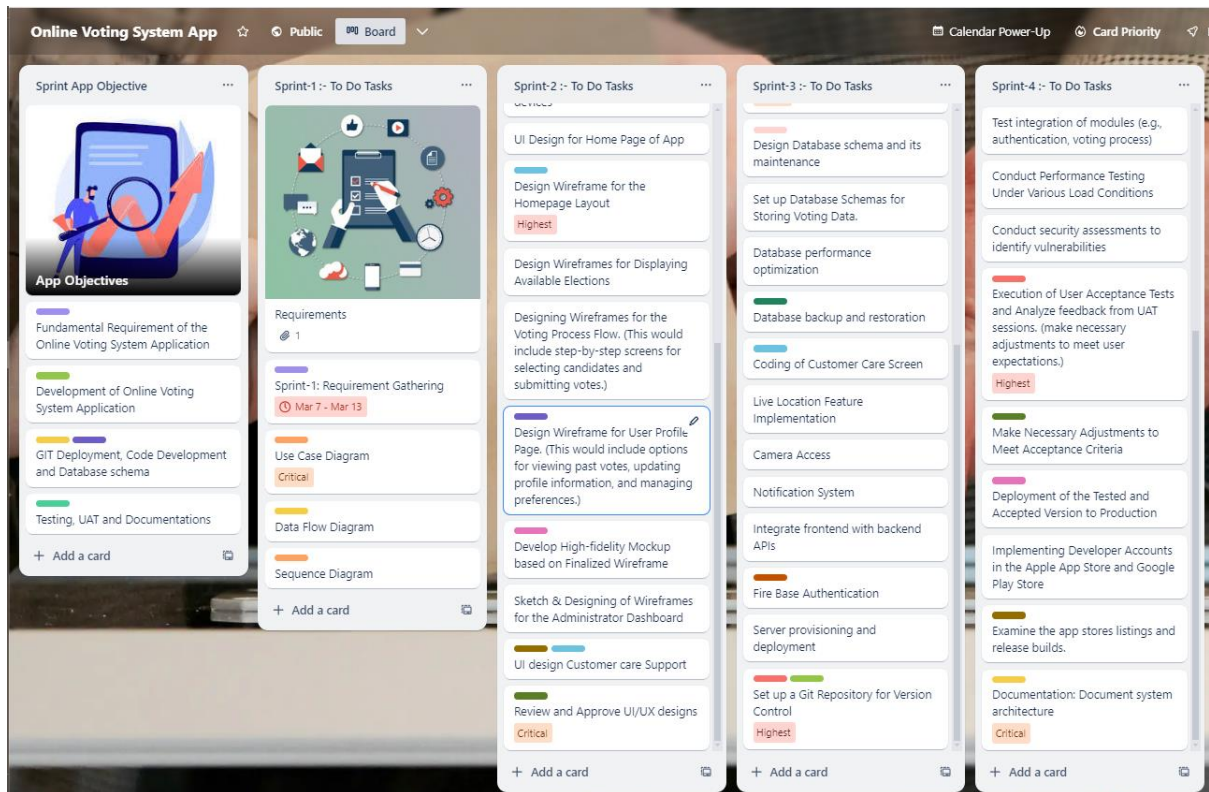


Figure 14. Phase I (ii)

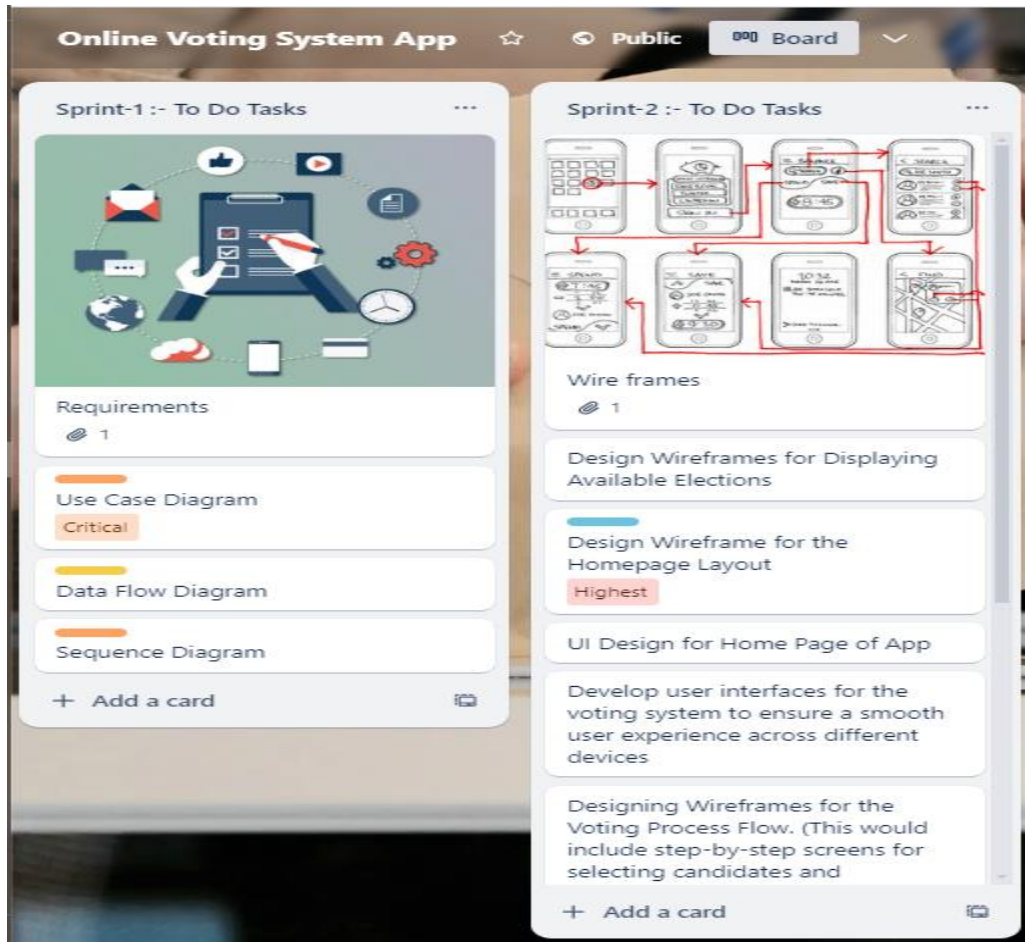


Figure 15. Phase I (iii)



Figure 16. Phase I (iv)

Phase-2

The current work is displayed in this phase. Taking this application one sprint at a time, we go to work. The ongoing work task are moved from each sprint to the On ProgressionTask.

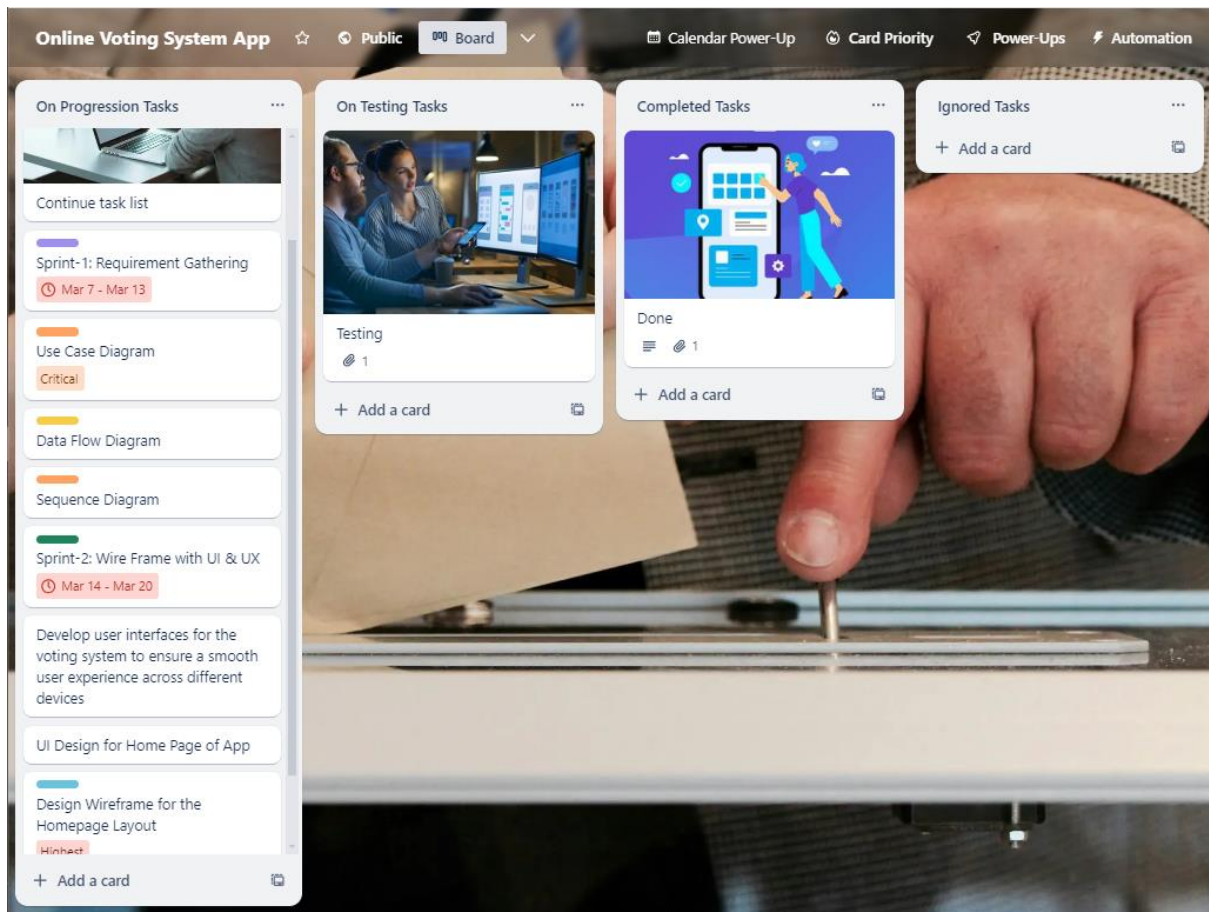


Figure 17. Phase II

Phase-3

When every job is completed, the entire card is transferred to the Complete Tasks state. Conversely, we begin testing the developed app. The Testing app card is therefore moved to the Testing list.

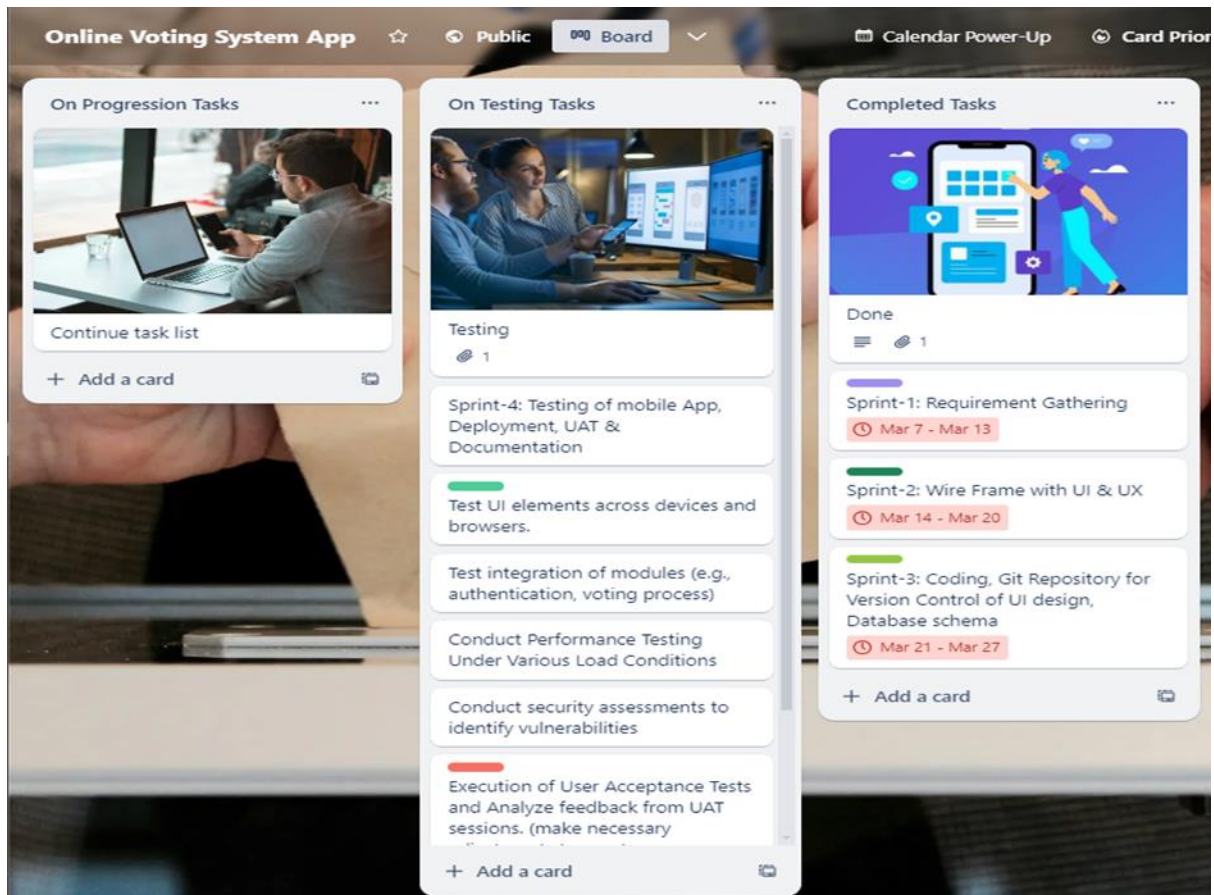


Figure 18. Phase III

Phase-4

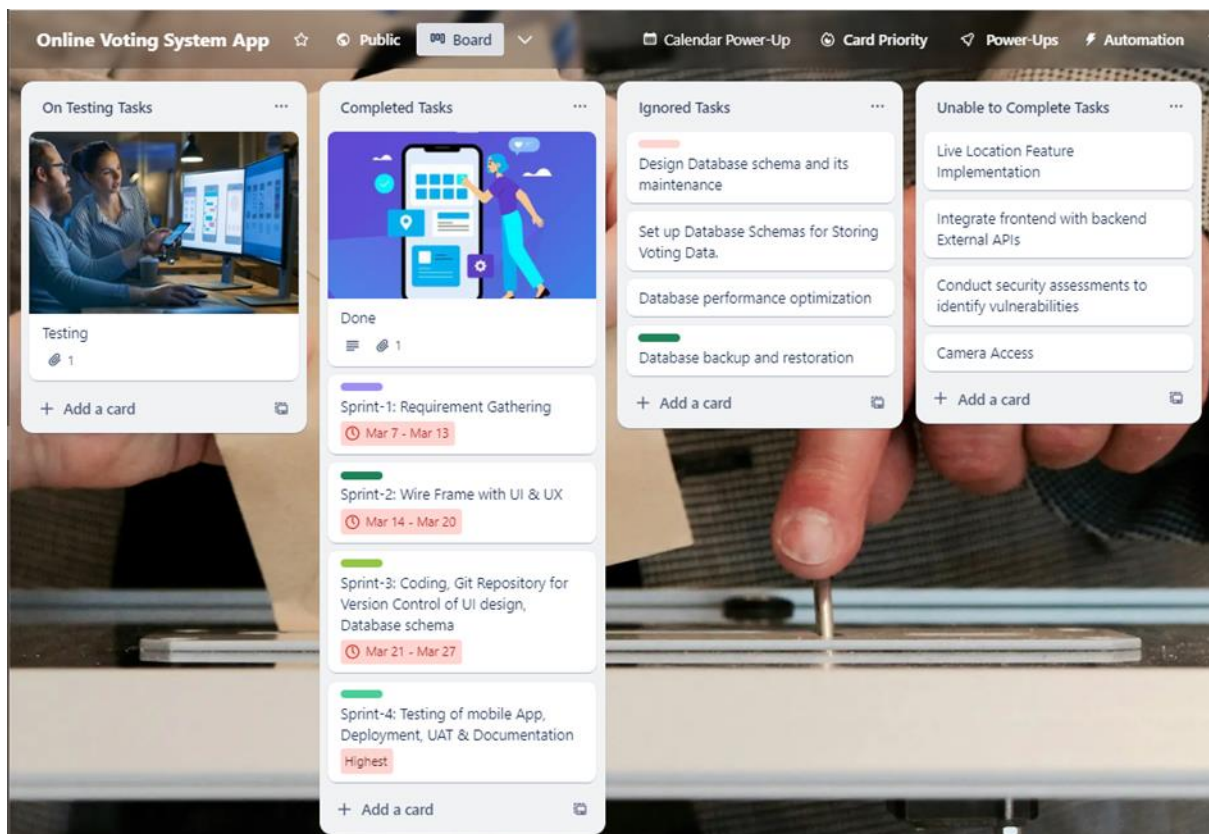


Figure 19. Phase IV (i)

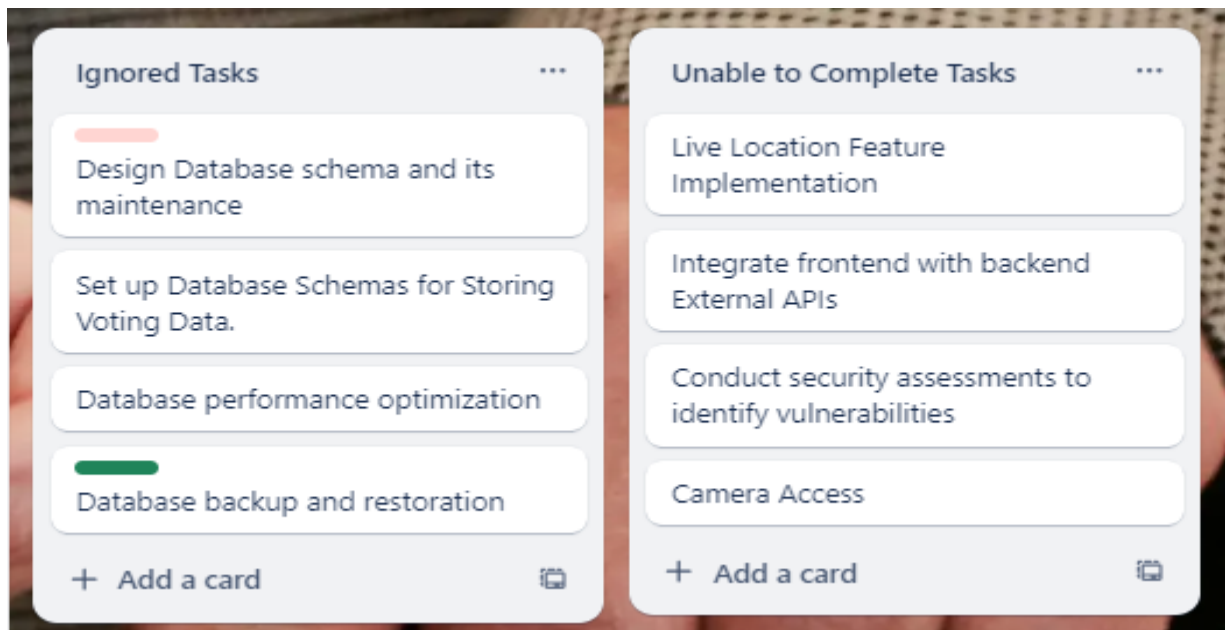


Figure 20. Phase IV (ii)

Burn-down Chart

A burn down chart is a visual tool used in project management, especially in Agile techniques like Scrum. It tracks the quantity of work still in a project throughout time. This aids teams in viewing their progress and identifying any possible roadblocks to finishing.

Sprint 1:- Burn-down chart



Figure 21. Sprint 1 Burn Down Chart

Sprint 2:- Burn-down chart

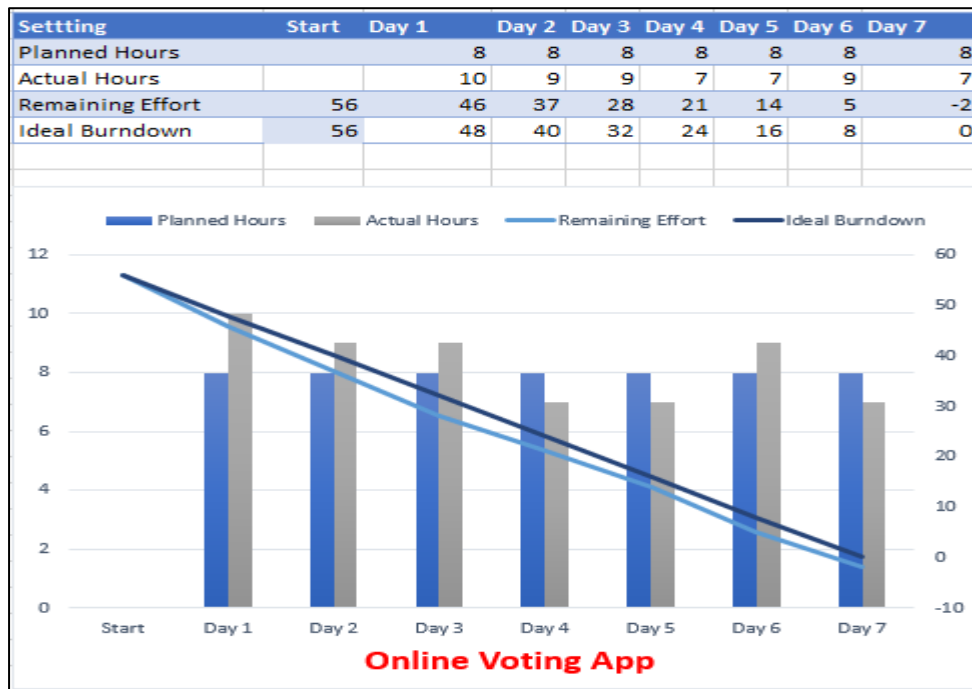


Figure 22. Sprint 2 Burn Down Chart

Sprint 3:- Burn-down chart

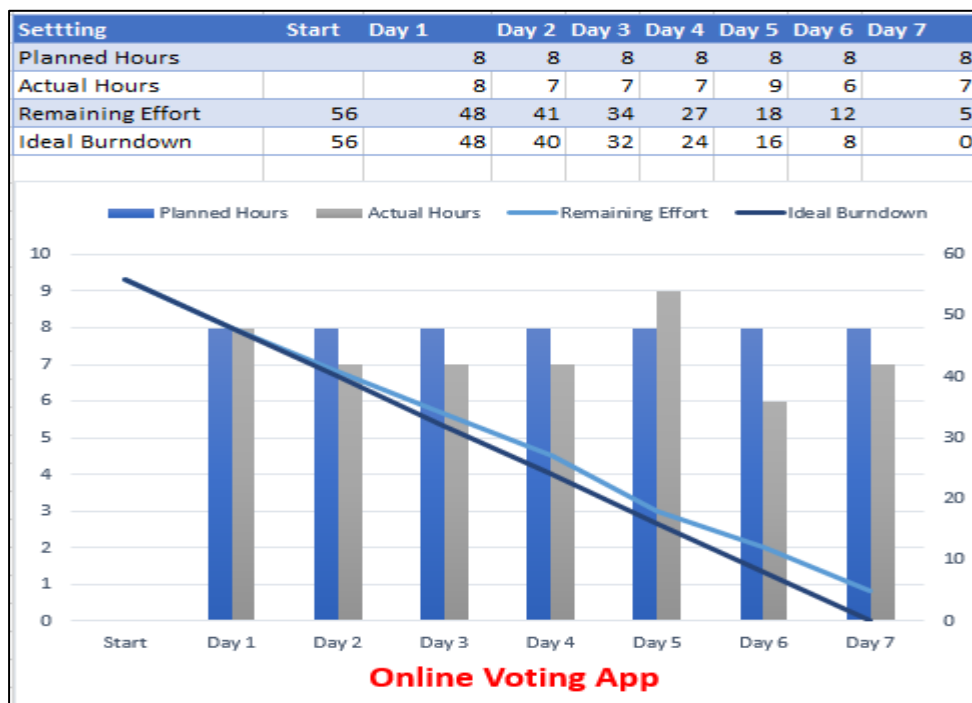


Figure 23. Sprint 3 Burn Down Chart

Sprint 4:- Burn-down chart

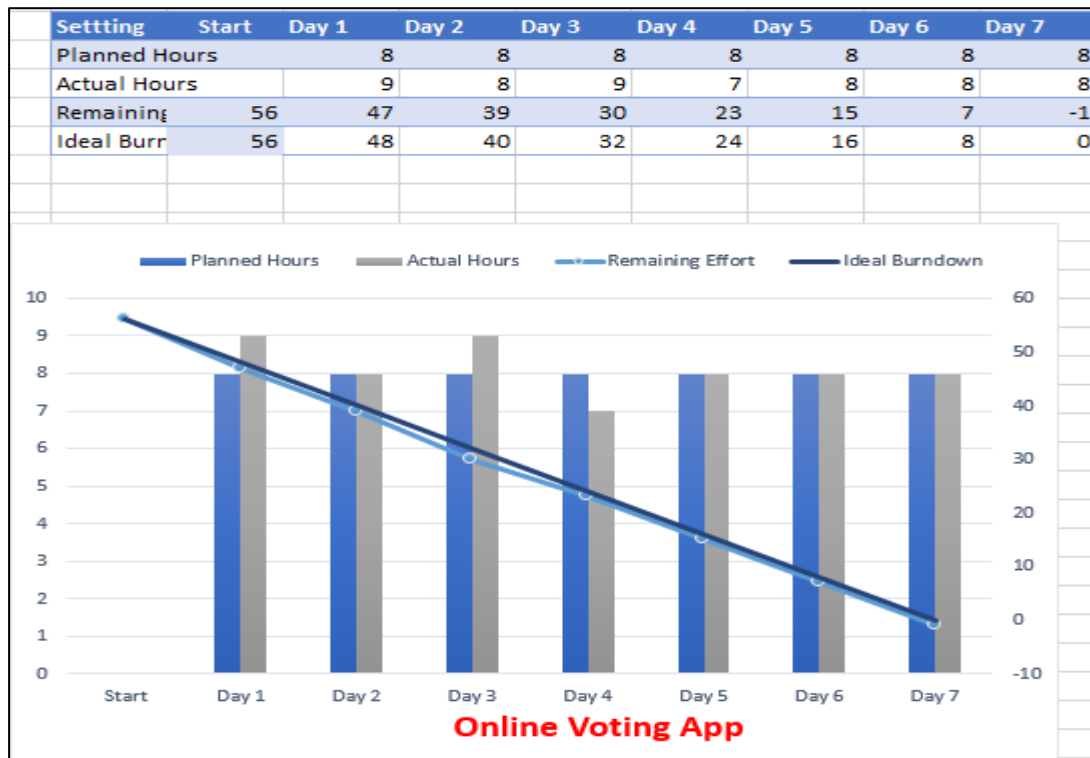


Figure 24. Sprint 4 Burn Down Chart

Overall Burn-down Chart

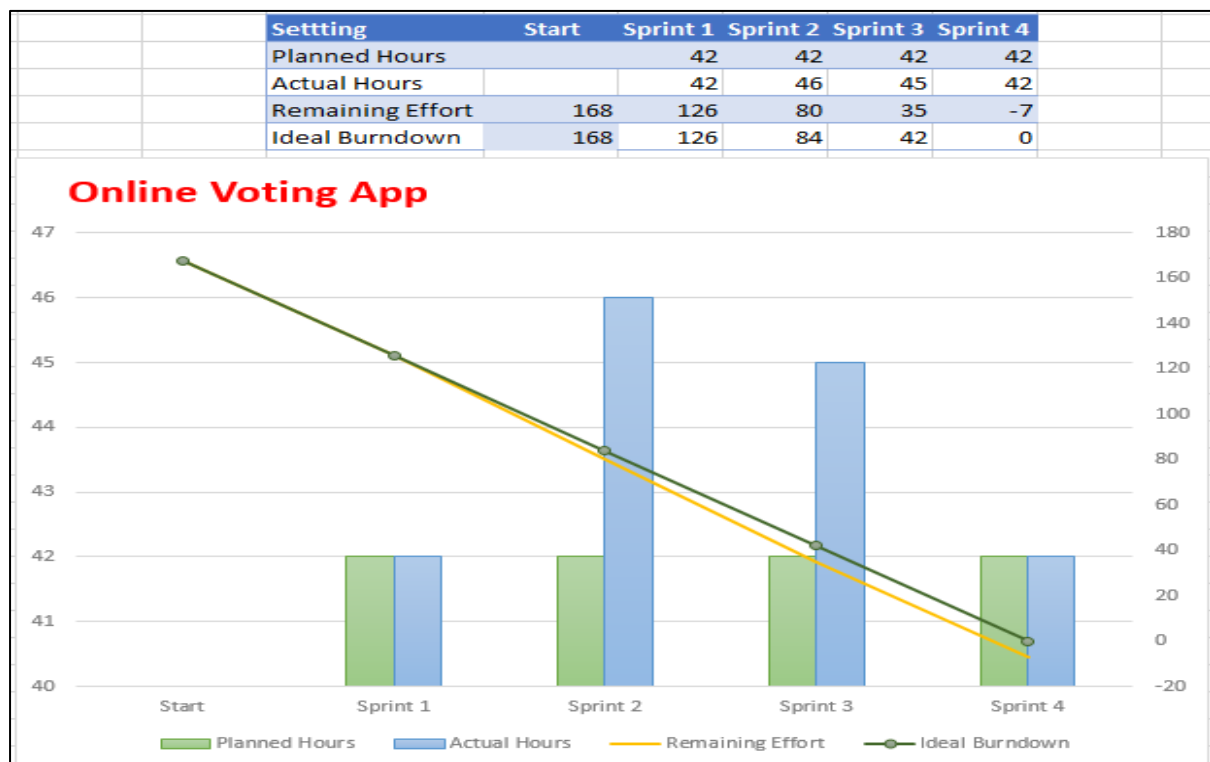


Figure 25. Overall Burn Down Chart

Firestore DB at backend and regarding API authentication and searching

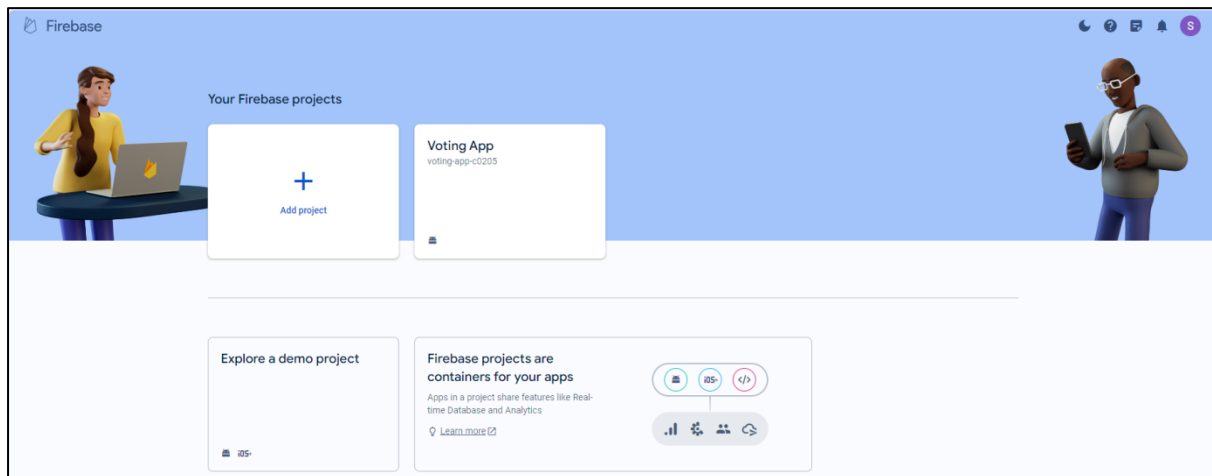


Figure 26 Firebase DB

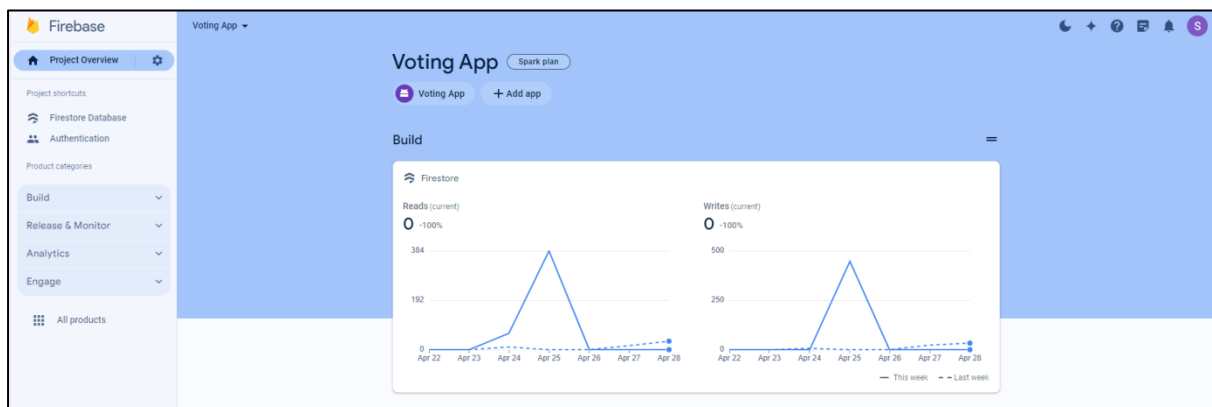


Figure 27 Firebase Voting app overview

The screenshot shows the "Authentication" page in the Firebase console. The left sidebar has a menu with "Project Overview", "Firestore Database", "Authentication", "Build", "Release & Monitor", "Analytics", and "Engage". The main content area shows the "Authentication" page with tabs for "Users", "Sign-in method", "Templates", "Usage", "Settings", and "Extensions". The "Users" tab is selected, showing a list of users. At the top of the list, there's a search bar "Search by email address, phone number, or user UID" and an "Add user" button. The table has columns: "Identifier", "Providers", "Created", "Signed in", and "User UID".

Identifier	Providers	Created	Signed in	User UID
sushil@gmail.com	✓	Apr 29, 2024	Apr 29, 2024	aKwYWRkYKsagdxenbVvRLn...
anshul@gmail.com	✓	Apr 28, 2024	Apr 28, 2024	lfvLa7kCJ0mnrRivOHYNEC7...
ashu@gmail.com	✓	Apr 27, 2024	Apr 27, 2024	LcukzydunRwbrzokndOYTXh...

At the bottom of the table, there's a "Rows per page" dropdown set to 50, and a pagination indicator "1 - 3 of 3".

Figure 28 Firebase authentication

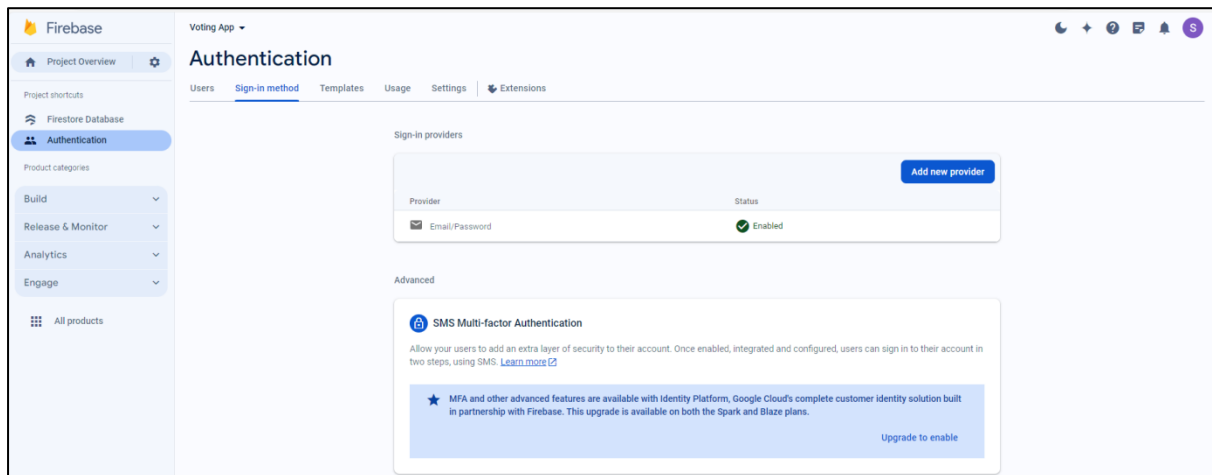


Figure 29 Sign in methods in firebase

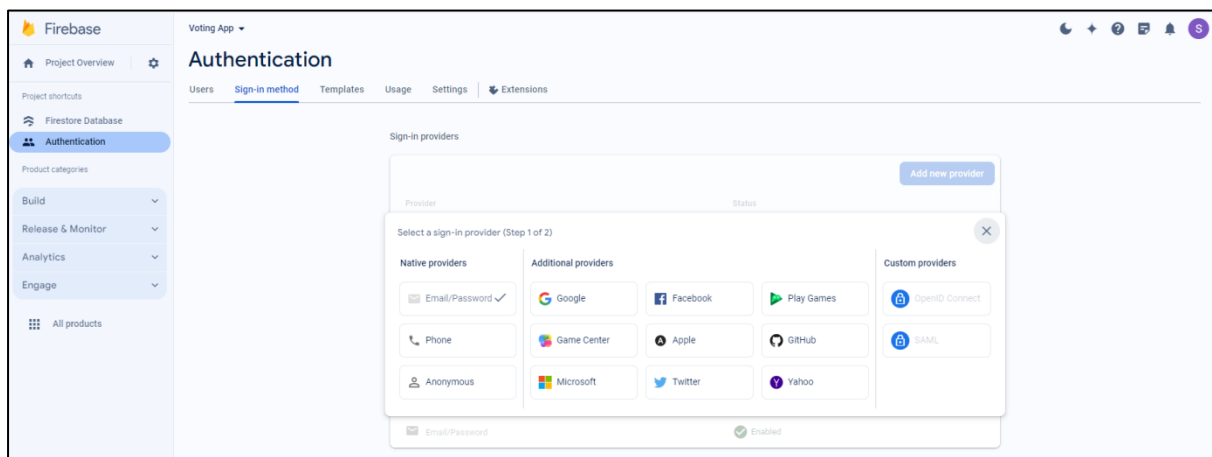


Figure 30 Gmail log in method in firebase

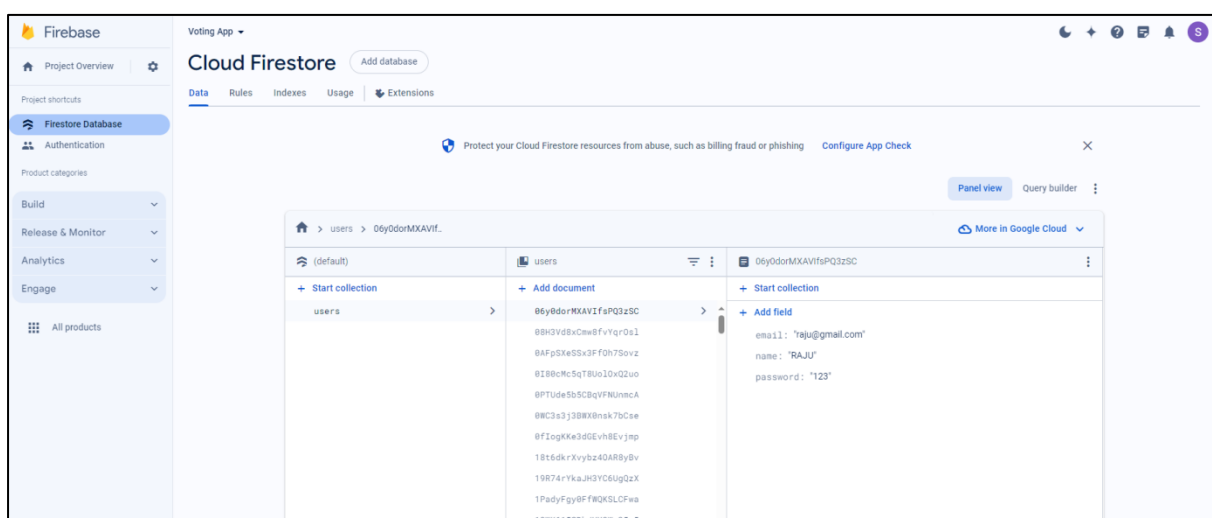


Figure 31 Cloud firestore

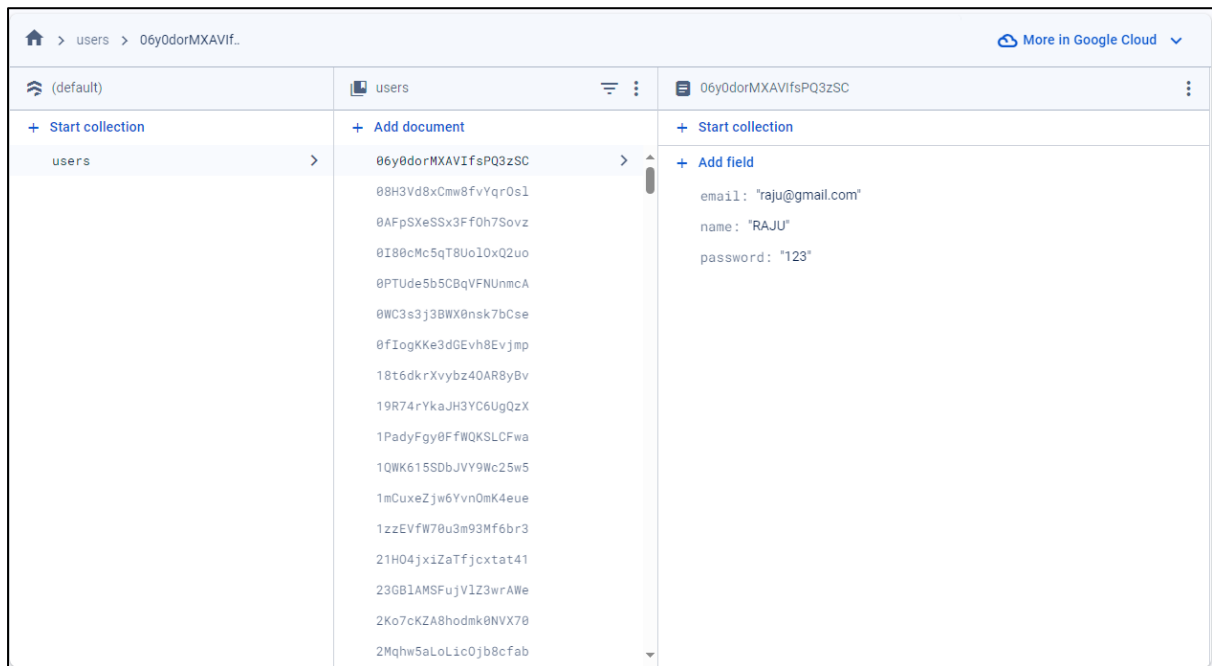


Figure 32 Collection list in firebase

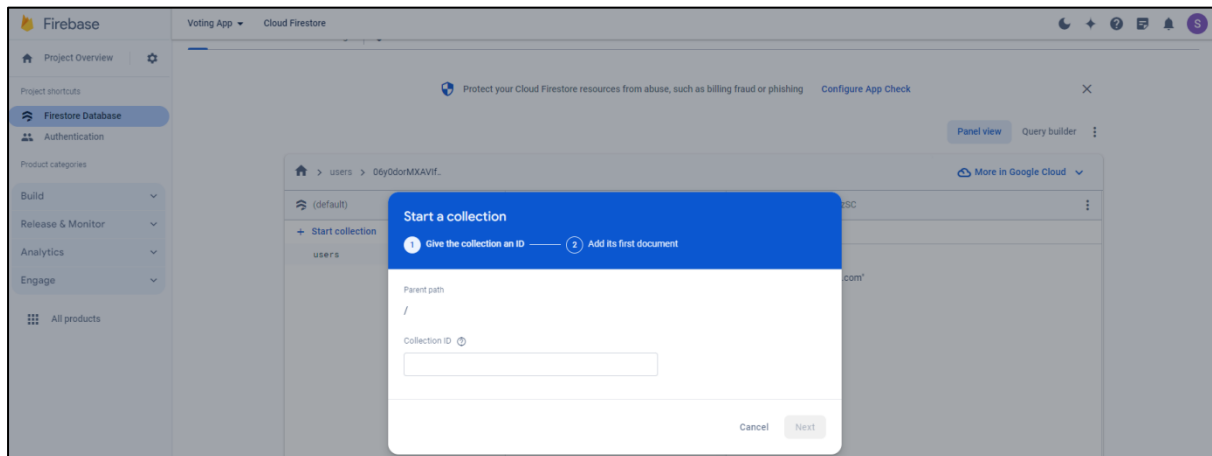


Figure 33 Collection starting in DB

Online Voting System Application(UI)

1. Welcome Page –



Figure 34. Welcome Page

2. Registration Page –

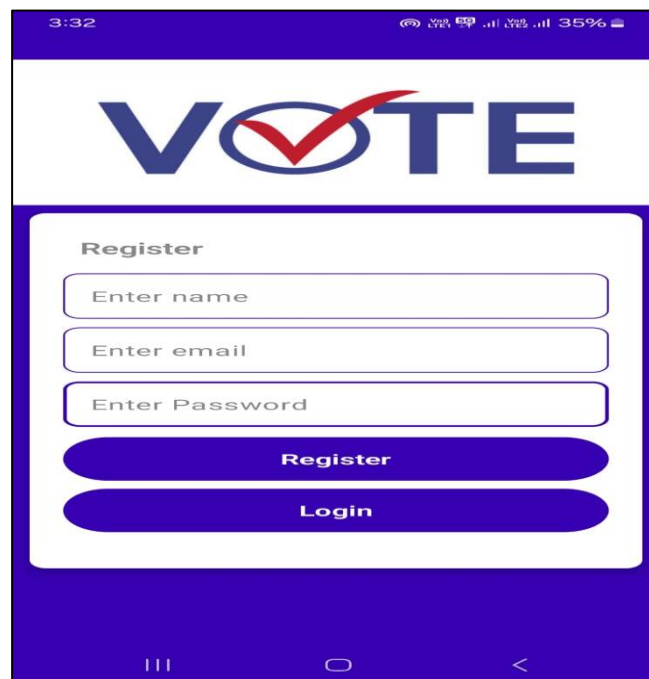
The image shows a mobile application interface for a registration page. At the top, there is a status bar with the time "3:32" and battery level "35%". Below the status bar is a header with the word "VOTE" in blue, with a red checkmark inside the "O". The main content area is a white box with a blue border. It contains the title "Register" in bold. Below the title are three input fields: "Enter name", "Enter email", and "Enter Password". At the bottom of the white box are two blue buttons: "Register" and "Login". The bottom of the screen shows a blue navigation bar with three icons: a hamburger menu, a home icon, and a back arrow.

Figure 35. Registration Page

3. Login Page –

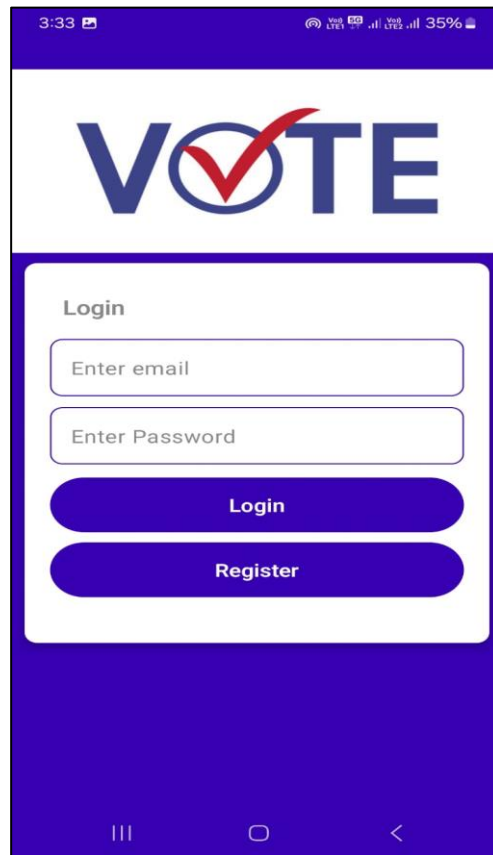


Figure 36. Login Page

4. Home Page –

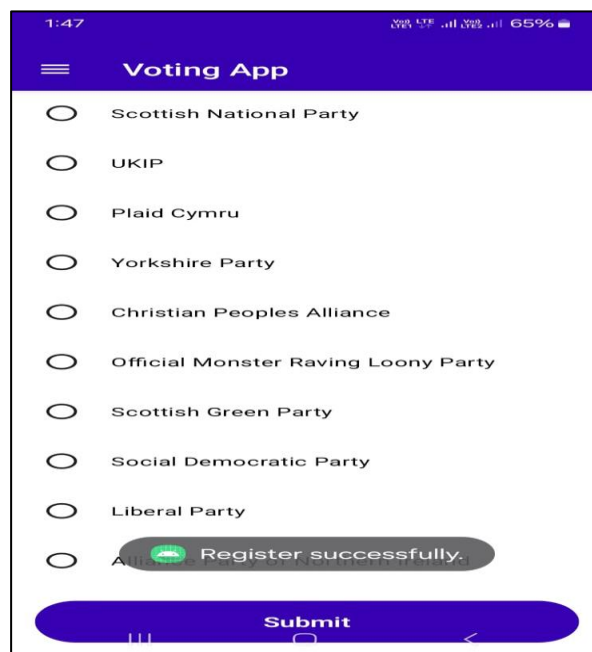


Figure 37. Home Page I

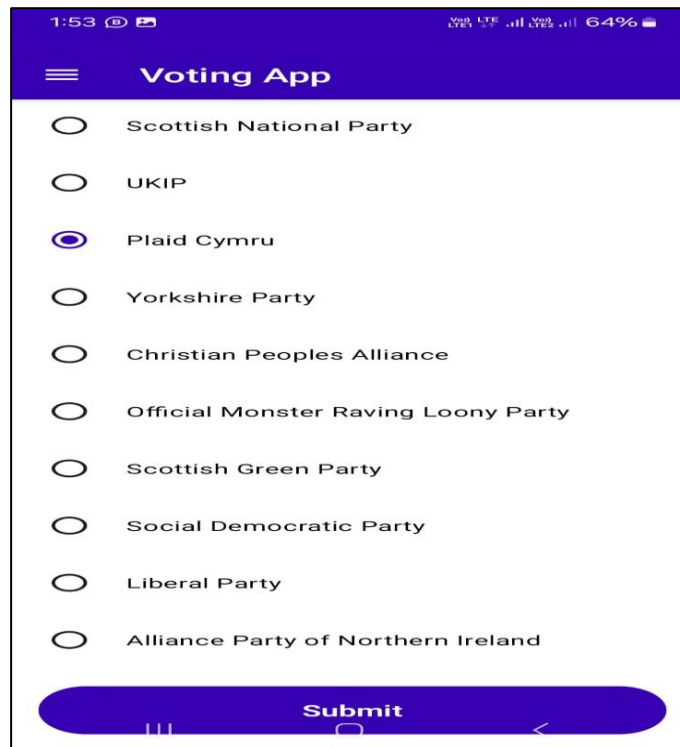


Figure 38. Home Page II

5. Summary of votes for parties –

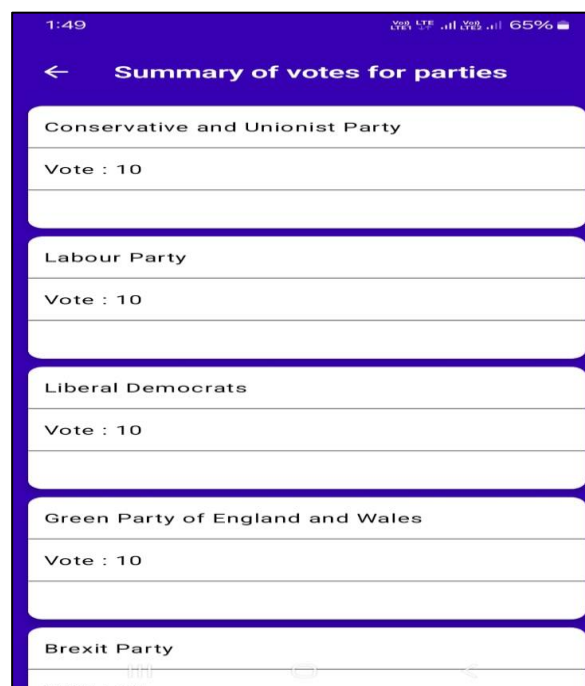


Figure 39. Summary of Votes

6. Log Out Page –

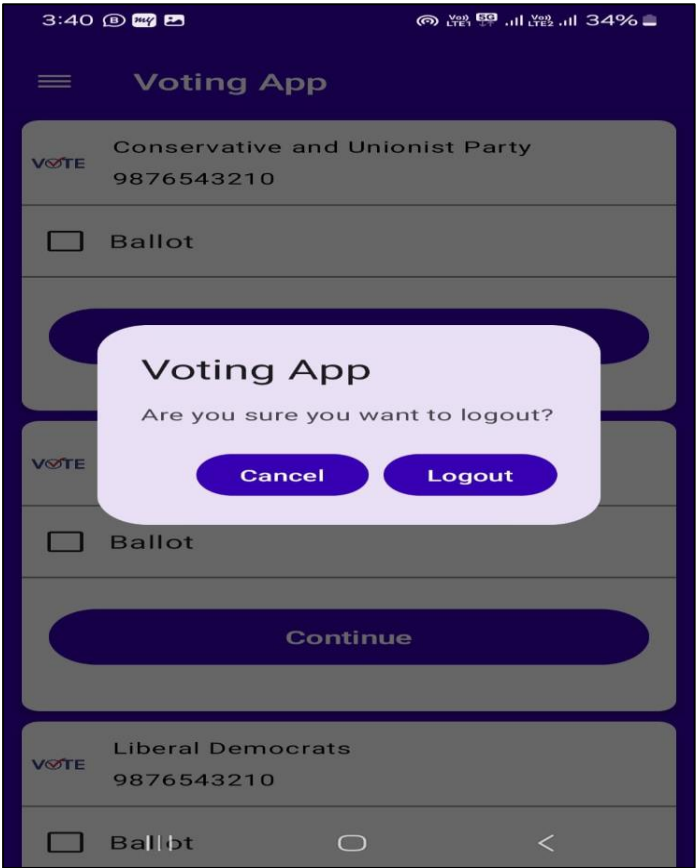


Figure 40. Log Out

GIT

1st commit

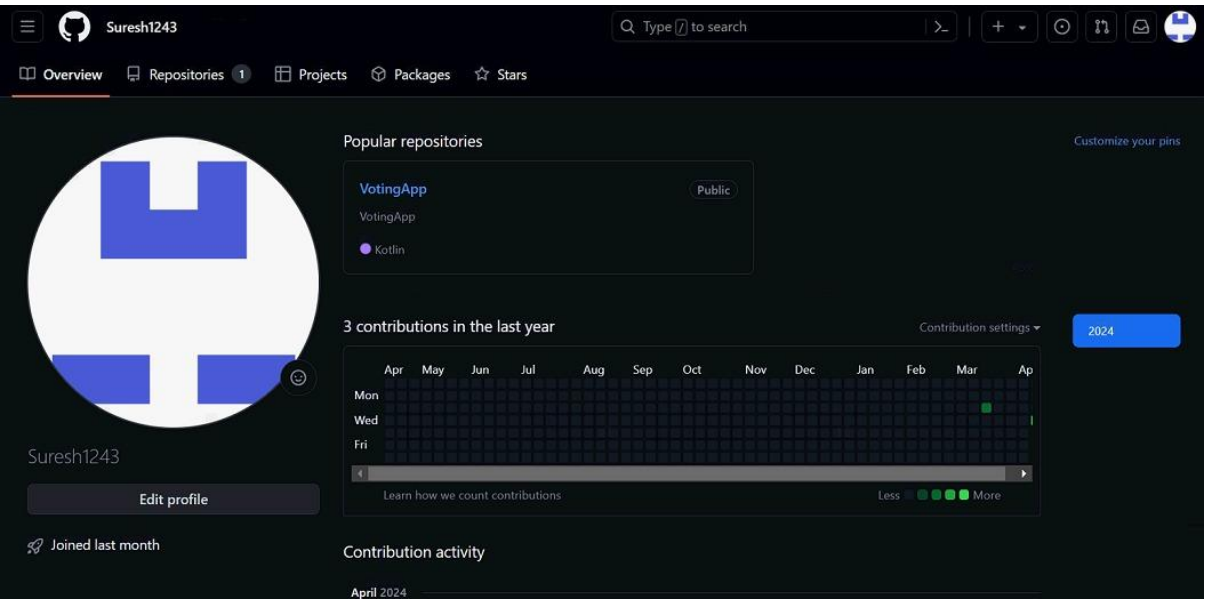


Figure 41. Ist Commit (overview)

```

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git remote add origin https://github.com/Suresh1243/VotingApp.git

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git push origin master
Enumerating objects: 91, done.
Counting objects: 100% (91/91), done.
Delta compression using up to 8 threads
Compressing objects: 100% (74/74), done.
Writing objects: 100% (91/91), 140.30 KiB | 1.95 MiB/s, done.
Total 91 (delta 5), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (5/5), done.
To https://github.com/Suresh1243/VotingApp.git
 * [new branch]      master -> master

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git commit -m "first commit"
[master (root-commit) ceeb544] first commit
52 files changed, 2080 insertions(+)
create mode 100644 .gitignore
create mode 100644 app/.gitignore
create mode 100644 app/build.gradle
create mode 100644 app/google-services.json
create mode 100644 app/proguard-rules.pro
create mode 100644 app/src/androidTest/java/com/voting/ExampleInstrumentedTest.kt
create mode 100644 app/src/main/AndroidManifest.xml
create mode 100644 app/src/main/java/com/voting/MainActivity.kt
create mode 100644 app/src/main/java/com/voting/routing/Navigation.kt
create mode 100644 app/src/main/java/com/voting/routing/Screen.kt
create mode 100644 app/src/main/java/com/voting/ui/login/LoginScreen.kt
create mode 100644 app/src/main/java/com/voting/ui/main/MainScreen.kt
create mode 100644 app/src/main/java/com/voting/ui/model/CandidateModel.kt
create mode 100644 app/src/main/java/com/voting/ui/model/ResultModel.kt
create mode 100644 app/src/main/java/com/voting/ui/register/RegisterScreen.kt
create mode 100644 app/src/main/java/com/voting/ui/result/ResultScreen.kt
create mode 100644 app/src/main/java/com/voting/ui/splash/SplashScreen.kt
create mode 100644 app/src/main/java/com/voting/ui/theme/Color.kt
create mode 100644 app/src/main/java/com/voting/ui/theme/Theme.kt
create mode 100644 app/src/main/java/com/voting/ui/theme/Type.kt
create mode 100644 app/src/main/java/com/voting/Utils/OutlineFormField.kt
create mode 100644 app/src/main/java/com/voting/Utils/RoundedButton.kt
create mode 100644 app/src/main/res/drawable-v24/ic_launcher_foreground.xml
create mode 100644 app/src/main/res/drawable/ic_launcher_background.xml
create mode 100644 app/src/main/res/drawable/ic_result.png
create mode 100644 app/src/main/res/drawable/ic_vote.jpg
create mode 100644 app/src/main/res/mipmap-anydpi-v26/ic_launcher.xml
create mode 100644 app/src/main/res/mipmap-anydpi-v26/ic_launcher_round.xml
create mode 100644 app/src/main/res/mipmap-anydpi-v33/ic_launcher.xml
create mode 100644 app/src/main/res/mipmap-hdpi/ic_launcher.webp
create mode 100644 app/src/main/res/mipmap-hdpi/ic_launcher_round.webp
create mode 100644 app/src/main/res/mipmap-mdpi/ic_launcher.webp
create mode 100644 app/src/main/res/mipmap-mdpi/ic_launcher_round.webp
create mode 100644 app/src/main/res/mipmap-xhdpi/ic_launcher.webp
create mode 100644 app/src/main/res/mipmap-xhdpi/ic_launcher_round.webp
create mode 100644 app/src/main/res/values/colors.xml
create mode 100644 app/src/main/res/values/themes.xml
create mode 100644 app/src/main/res/xml/backup_rules.xml
create mode 100644 app/src/main/res/xml/data_extraction_rules.xml
create mode 100644 app/src/test/java/com/voting/ExampleUnitTest.kt
create mode 100644 build.gradle
create mode 100644 gradle.properties
create mode 100644 gradle/wrapper/gradle-wrapper.jar
create mode 100644 gradlew.bat
create mode 100644 settings.gradle

nothing added to commit but untracked files present (use "git add" to track)

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git add .
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/build.gradle', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/google-services.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/proguard-rules.pro', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/androidTest/java/com/voting/ExampleInstrumentedTest.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/AndroidManifest.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/MainActivity.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/login/LoginScreen.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/main/MainScreen.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/model/CandidateModel.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/model/ResultModel.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/register/RegisterScreen.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/result/ResultScreen.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/splash/SplashScreen.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Color.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Theme.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Type.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/Utils/OutlineFormField.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/Utils/RoundedButton.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable-v24/ic_launcher_foreground.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable/ic_launcher_background.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable/ic_result.png', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable/ic_vote.jpg', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-anydpi-v26/ic_launcher.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-anydpi-v26/ic_launcher_round.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-anydpi-v33/ic_launcher.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-hdpi/ic_launcher.webp', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-hdpi/ic_launcher_round.webp', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-mdpi/ic_launcher.webp', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/mipmap-mdpi/ic_launcher_round.webp', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/values/colors.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/values/themes.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/xml/backup_rules.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/xml/data_extraction_rules.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/test/java/com/voting/ExampleUnitTest.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'build.gradle', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'gradle.properties', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'gradlew.bat', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'settings.gradle', LF will be replaced by CRLF the next time Git touches it

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git commit -m "first commit"
[master (root-commit) ceeb544] first commit

```

Figure 42. Ist Commit (master)

```
patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp
$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:     git config --global init.defaultBranch <name>
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:     git branch -m <name>
Initialized empty Git repository in C:/Users/patil/Downloads/Voting App/VotingApp/.git/

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git status
On branch master

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        .gitignore
        app/
        build.gradle
        gradle.properties
        gradle/
        gradlew
        gradlew.bat
        settings.gradle

nothing added to commit but untracked files present (use "git add" to track)

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp (master)
$ git add .
```

Figure 43. Ist Commit (untracked files)

The screenshot shows a terminal window at the top with the following commands and output:

```
patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp
$ git config --global user.name "Suresh1243"

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp
$ git config --global user.email "sureshchowdary631@gmail.com"

patil@ADMIN MINGW64 ~/Downloads/Voting App/VotingApp
```

Below the terminal is a screenshot of the GitHub repository page for 'Suresh1243 / VotingApp'. The repository is public and shows the first commit by Suresh1243, committed 5 minutes ago. The commit message is 'first commit'. The commit details table lists the following files:

File	Commit Message	Time
app	first commit	5 minutes ago
gradle/wrapper	first commit	5 minutes ago
.gitignore	first commit	5 minutes ago
build.gradle	first commit	5 minutes ago
gradle.properties	first commit	5 minutes ago
gradlew	first commit	5 minutes ago
gradlew.bat	first commit	5 minutes ago
settings.gradle	first commit	5 minutes ago

The right sidebar of the GitHub page shows repository statistics: 0 stars, 1 watching, and 0 forks. It also includes sections for Releases and Packages, both indicating no published items.

Figure 44. Ist Commit (code)

2nd commit

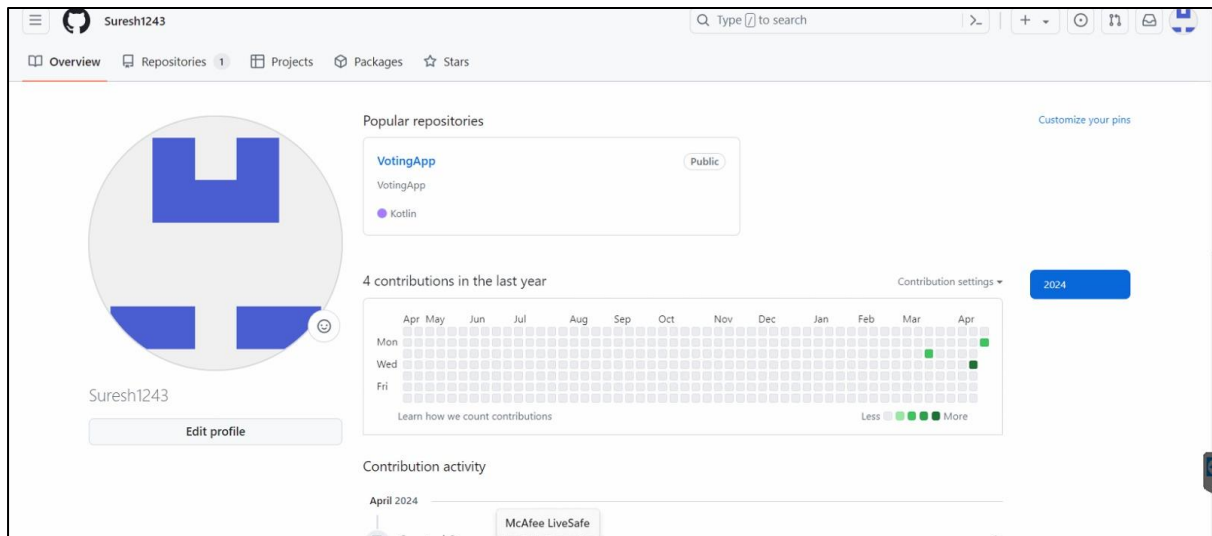


Figure 45. IInd Commit (overview)

```
prave@HP-000 MINGW64 ~/Downloads/second commit voting app/cloned/VotingApp (master)
$ git push
Enumerating objects: 54, done.
Counting objects: 100% (54/54), done.
Delta compression using up to 16 threads
Compressing objects: 100% (24/24), done.
Writing objects: 100% (31/31), 7.67 KiB | 1.09 MiB/s, done.
Total 31 (delta 11), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (11/11), completed with 10 local objects.
To https://github.com/Suresh1243/VotingApp.git
   ceeb544..01cbacd master -> master

prave@HP-000 MINGW64 ~/Downloads/second commit voting app/cloned/VotingApp (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

nothing to commit, working tree clean
```

Figure 46. IInd Commit (working tree clean)

```

prave@HP-000 MINGW64 ~/Downloads/second commit voting app/cloned/VotingApp (master)
$ git commit -m "second commit"
[master 01cbacd] second commit
14 files changed, 572 insertions(+), 224 deletions(-)
create mode 100644 app/src/main/java/com/voting/ui/drawer/NavDrawer.kt
create mode 100644 app/src/main/java/com/voting/ui/drawer/TopBar.kt
create mode 100644 app/src/main/java/com/voting/ui/localDatabase/VotingLocalDatabase.kt
create mode 100644 app/src/main/java/com/voting/utils/BorderButton.kt
create mode 100644 app/src/main/java/com/voting/utils/Extension.kt

prave@HP-000 MINGW64 ~/Downloads/second commit voting app/cloned/VotingApp (master)
$ git add .
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/build.gradle', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/google-services.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/proguard-rules.pro', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/androidTest/java/com/voting/ExampleInstrumentedTest.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/MainActivity.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Color.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Theme.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Type.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/utils/RoundedButton.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable-v24/ic_launcher_foreground.xml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable/ic_launcher_background.xml', LF will be replaced by CRLF the next time Git touches it

prave@HP-000 MINGW64 ~/Downloads/second commit voting app/cloned/VotingApp (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   .gitignore
        modified:   app/build.gradle
        modified:   app/google-services.json
        modified:   app/proguard-rules.pro
        modified:   app/src/androidTest/java/com/voting/ExampleInstrumentedTest.kt
        modified:   app/src/main/AndroidManifest.xml
        modified:   app/src/main/java/com/voting/MainActivity.kt
        modified:   app/src/main/java/com/voting/ui/login/LoginScreen.kt
        modified:   app/src/main/java/com/voting/ui/main/MainScreen.kt
        modified:   app/src/main/java/com/voting/ui/register/RegisterScreen.kt
        modified:   app/src/main/java/com/voting/ui/result/ResultsScreen.kt
        modified:   app/src/main/java/com/voting/ui/splash/SplashScreen.kt
        modified:   app/src/main/java/com/voting/ui/theme/Color.kt
        modified:   app/src/main/java/com/voting/ui/theme/Theme.kt
        modified:   app/src/main/java/com/voting/ui/theme/Type.kt

```

Figure 47. IInd Commit (MASTER)

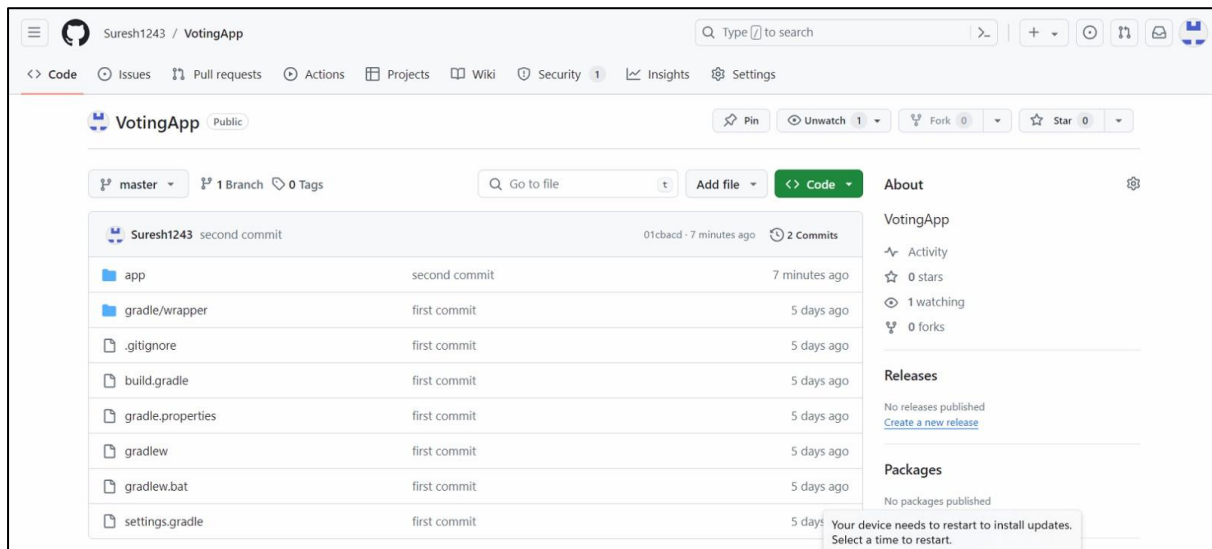


Figure 48. IIrd Commit (Code)

3rd commit

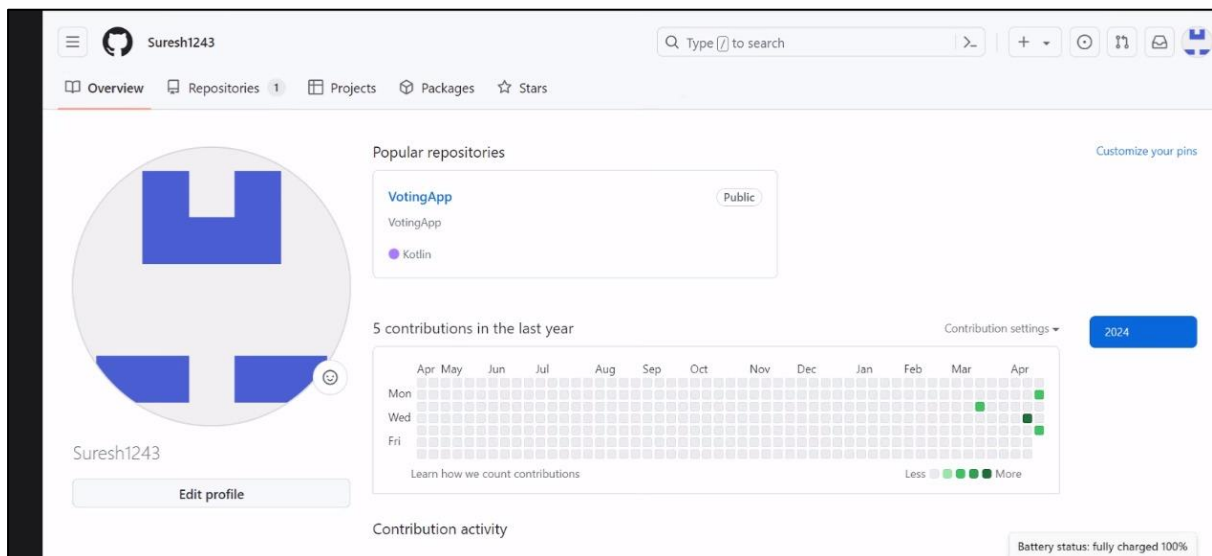


Figure 49. IIIrd Commit (Overview)

```
prave@HP-000 MINGW64 ~/Downloads/third commit voting app/cloned/votingApp (master)
$ git push
Enumerating objects: 47, done.
Counting objects: 100% (47/47), done.
Delta compression using up to 16 threads
Compressing objects: 100% (18/18), done.
Writing objects: 100% (25/25), 4.33 KiB | 887.00 KiB/s, done.
Total 25 (delta 10), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (10/10), completed with 10 local objects.
To https://github.com/Suresh1243/VotingApp.git
01cbacd..2e49e7c master -> master
```

```

prave@HP-000 MINGW64 ~/Downloads/third commit voting app/cloned/VotingApp (master)
$ git commit -m "third commit"
[master 2e49e7c] third commit
8 files changed, 218 insertions(+), 189 deletions(-)
create mode 100644 app/src/main/java/com/voting/appClass/AppClass.kt

prave@HP-000 MINGW64 ~/Downloads/third commit voting app/cloned/VotingApp (master)
$ git add .
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/build.gradle', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/google-services.json', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/proguard-rules.pro', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/androidTest/java/com/voting/ExampleInstrumentedTest.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/MainActivity.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/drawer/NavDrawer.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Color.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Theme.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Type.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/utils/RoundedButton.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable/ic_launcher_foreground.xml', LF will be replaced by CRLF the next time Git touches it

```

Figure 50. IIIrd Commit (Master)

Screenshot of the GitHub repository page for 'VotingApp' by user 'Suresh1243'. The page shows the 'Code' tab with a file list for the 'third commit' (2e49e7c). The file list includes 'app', 'gradle/wrapper', '.gitignore', 'build.gradle', 'gradle.properties', 'gradlew', and 'gradlew.bat'. The 'app' directory was committed 1 minute ago, while the others were committed last week. The repository has 1 branch, 0 tags, 0 stars, 1 watcher, and 0 forks. The 'About' section shows no releases published.

Figure 51. IIIrd Commit (Code)

4th commit

Screenshot of a GitHub profile page for Suresh1243. The profile shows a blue and white avatar, the name 'Suresh1243', and an 'Edit profile' button. The 'Popular repositories' section shows 'VotingApp' as a public repository in Kotlin. The '6 contributions in the last year' section shows a calendar grid with green squares indicating contributions, primarily in March and April 2024. The 'Contribution activity' section is partially visible at the bottom.

```
prave@HP-000 MINGW64 ~/Downloads/final commit voting/clone/VotingApp (master)
$ git push
Enumerating objects: 33, done.
Counting objects: 100% (33/33), done.
Delta compression using up to 16 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (17/17), 2.27 KiB | 2.27 MiB/s, done.
Total 17 (delta 9), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (9/9), completed with 9 local objects.
To https://github.com/Suresh1243/VotingApp.git
 2e49e7c..df0922c  master -> master

prave@HP-000 MINGW64 ~/Downloads/final commit voting/clone/VotingApp (master)
```

```
prave@HP-000 MINGW64 ~/Downloads/final commit voting/clone/VotingApp (master)
$ git commit -m "final commit"
[master df0922c] final commit
 5 files changed, 94 insertions(+), 159 deletions(-)

prave@HP-000 MINGW64 ~/Downloads/final commit voting/clone/VotingApp (master)
$ git push
```

```
prave@HP-000 MINGW64 ~/Downloads/final commit voting/clone/VotingApp (master)
$ git add .
warning: in the working copy of '.gitignore', LF will be replaced by CRLF the ne
xt time Git touches it
warning: in the working copy of 'app/build.gradle', LF will be replaced by CRLF
the next time Git touches it
warning: in the working copy of 'app/google-services.json', LF will be replaced
by CRLF the next time Git touches it
warning: in the working copy of 'app/proguard-rules.pro', LF will be replaced by
CRLF the next time Git touches it
warning: in the working copy of 'app/src/androidTest/java/com/voting/ExampleInst
rumentedTest.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/MainActivity.kt',
LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/drawer/NavDrawe
r.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Color.kt'
, LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Theme.kt'
, LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/ui/theme/Type.kt',
LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/java/com/voting/utils/RoundedButto
n.kt', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'app/src/main/res/drawable-v24/ic_launcher_foreg
round.xml', LF will be replaced by CRLF the next time Git touches it
```

The screenshot shows the GitHub interface for a repository named 'VotingApp' owned by 'Suresh1243'. The repository is public and has 1 branch (master) and 0 tags. The file list shows the following files and their commit history:

File	Commit History
app	final commit (now)
gradle/wrapper	first commit (2 weeks ago)
.gitignore	first commit (2 weeks ago)
build.gradle	first commit (2 weeks ago)
gradle.properties	first commit (2 weeks ago)
gradlew	first commit (2 weeks ago)
gradlew.bat	first commit (2 weeks ago)

On the right side, the 'About' section shows 0 stars, 1 watching, and 0 forks. The 'Releases' section indicates no releases published. The 'Packages' section shows no packages published.

Reference

Joorabchi, M.E., Mesbah, A. and Kruchten, P., 2013, October. Real challenges in mobile app development. In 2013 ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (pp. 15-24). IEEE.

Francese, R., Gravino, C., Risi, M., Scanniello, G. and Tortora, G., 2017, May. Mobile app development and management: results from a qualitative investigation. In 2017 IEEE/ACM 4th International Conference on Mobile Software Engineering and Systems (MOBILESoft) (pp. 133-143). IEEE.

Lieberum, T., Schiffels, S. and Kolisch, R., 2022. Should we all work in sprints? How agile project management improves performance. *Manufacturing & Service Operations Management*, 24(4), pp.2293-2309.

Grebić, B., 2019. Traditional vs agile project management in the service sector. *European Project Management Journal*, 9(2), pp.55-63.

Blischak, J.D., Davenport, E.R. and Wilson, G., 2016. A quick introduction to version control with Git and GitHub. *PLoS computational biology*, 12(1), p.e1004668.

Haaranen, L. and Lehtinen, T., 2015, June. Teaching git on the side: Version control system as a course platform. In *Proceedings of the 2015 ACM conference on innovation and technology in computer science education* (pp. 87-92).

Tavares, B.G., da Silva, C.E.S. and de Souza, A.D., 2019. Risk management analysis in Scrum software projects. *International Transactions in Operational Research*, 26(5), pp.1884-1905.

Hossain, E., Babar, M.A. and Paik, H.Y., 2009, July. Using scrum in global software development: a systematic literature review. In *2009 Fourth IEEE International Conference on Global Software Engineering* (pp. 175-184). Ieee.

Chaudhuri, D.J. and Chaudhuri, A., 2011. Agile burndown chart deviation-predictive analysis to improve iteration planning. In *Proceedings of the International Conference on Software Engineering Research and Practice (SERP)* (p. 1). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).

Dalton, J. and Dalton, J., 2019. Burn down chart. *Great Big Agile: An OS for Agile Leaders*, pp.143-145.