

Ain Shams Carpool Project

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Video Link:

https://drive.google.com/file/d/1Qa9fiA2buVEiXOmwkUKgDITGi76xyibK/view?usp=sharing

GitHub Link: https://github.com/zakoshgo/MobileProgramming-CarPool.git

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Introduction:

Carpool 2.0 represents a groundbreaking approach to ridesharing within the academic community, focusing on the transportation needs to and from Abdu-Basha to anywhere. As a testament to our commitment to safety and community, users are required to sign in with their active @eng.asu.edu.eg accounts, fostering a trusted closed community environment.

Operated by students for students, Carpool 2.0 introduces a revolutionary strategy in recruiting drivers and managing the service. This pilot project will streamline rides to two designated destination points – Gate 3 and 4 – with fixed departure and return times. Departure is scheduled for 7:30 am from various locations to one to the 2 gates, while the return ride is set at 5:30 pm from the Faculty of Engineering campus.

To ensure a seamless experience, customers are required to reserve their seats in advance. Those in need of a ride at 7:30 am must secure their seat before 10:00 pm the previous day, and for the 5:30 pm return ride, reservations must be made before 1:00 pm on the same day.

In addition, mobile App will be developed for drivers to confirm orders and update status data. Orders must be confirmed before 11:30 pm for the morning ride and before 4:30 pm for the afternoon ride, ensuring timely coordination between drivers and passengers.

Specs(Features)

For Passengers App

1. Authentication:

- Login Page:
 - Implement Firebase Authentication for secure user login.
 - Include a "Sign Up" option for new users.
 - Testing Credentials:
 - Provide a test account with login information for testing purposes.

2. Home Page:

- Route Information:
 - Display a list of available routes to and from Ainshams Campus.
 - Utilize a Recycler View for an organized and user-friendly display.
 - Include the status of each route.
 - Reservation:
 - Allow users to select a route to reserve.

3. Cart Page:

- Order Review:
 - Provide a cart page for users to review their selected route.
 - Include options for making payments.
 - Confirmation:
 - Implement a confirmation button for finalizing reservations.

4. Order History:

- Tracking/Status Page:
 - Enable users to view a history of their requested rides.
 - Include a tracking/status page for each ride.

5. Database Integration:

- Firebase Real-time Database:
 - Utilize Firebase Real-time Database for storing route information and order status.
- Local Database (SQLite):
 - Store a copy of profile data for passengers and drivers locally using SQLite.

• Ensure synchronization with Firebase for consistency.

6. Order Tracking Page:

• Status Updates:

- Implement a page for users to track the status of their reservations.
- Display detailed ride information.

7. Profile Page:

• User Profile:

- Enable users to edit their profile information.
- Ensure updates reflect in both the local database and Firebase.

For Driver App

1. Authentication:

Login Page:

- Implement Firebase Authentication for secure user login.
- Include a "Sign Up" option for new users.

Testing Credentials:

• Provide a test account with login information for testing purposes.

2. Home Page:

• Route Information:

- Display a list of routes belongs to the current Driver to and from Ainshams Campus.
- Utilize a Recycler View for an organized and user-friendly display.
- Include the status of each route.

3. Add Route Page:

• Order Review:

 Provide a Add route page for Drivers to Add route details needed as Date, Time, Source, Destination, and Price.

Confirmation:

• Implement a confirmation button for finalizing Adding route.

5. Database Integration:

• Firebase Real-time Database:

• Utilize Firebase Real-time Database for storing route information and order status.

• Local Database (SQLite):

- Store a copy of profile data for drivers locally using SQLite.
- Ensure synchronization with Firebase for consistency.

6. Ride Tracking Page:

• Status Updates:

- Implement a page for drivers to track the status of passengers reservations.
- Accept or reject passengers
- Change the State of Trip
- Display detailed ride information.

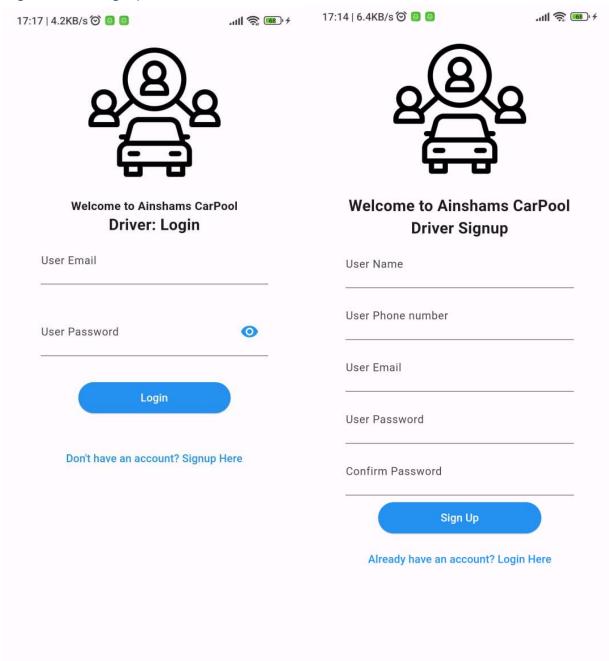
7. Profile Page:

- User Profile:
 - Enable drivers to edit their profile information.
 - Ensure updates reflect in both the local database and Firebase.

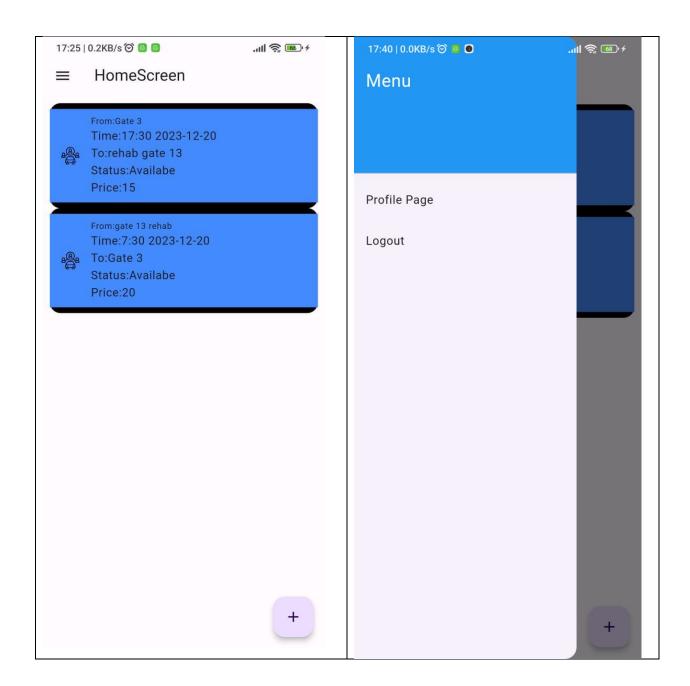
Screens Layouts:

Driver

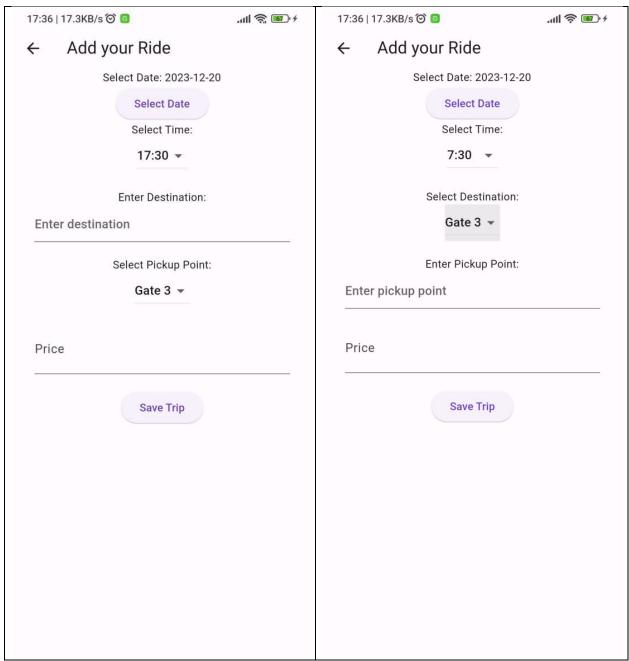
Login Screen & Signup Screen



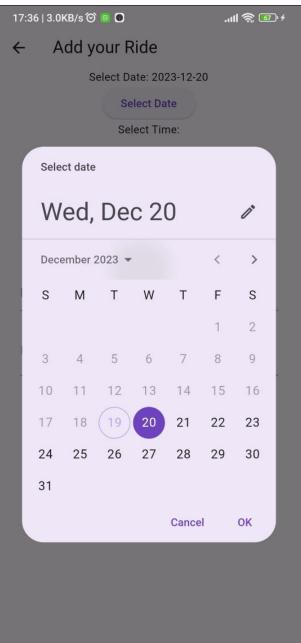
HomeScreen



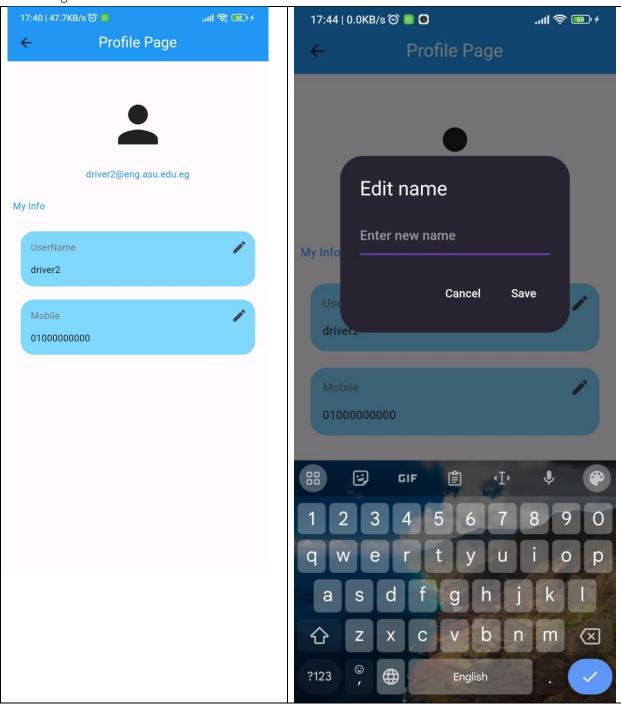
Add Ride Screen



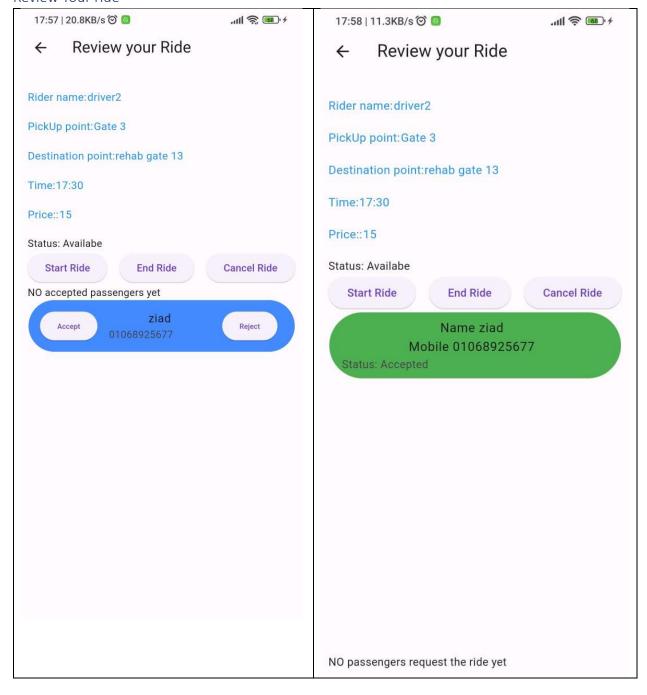




Profile Page

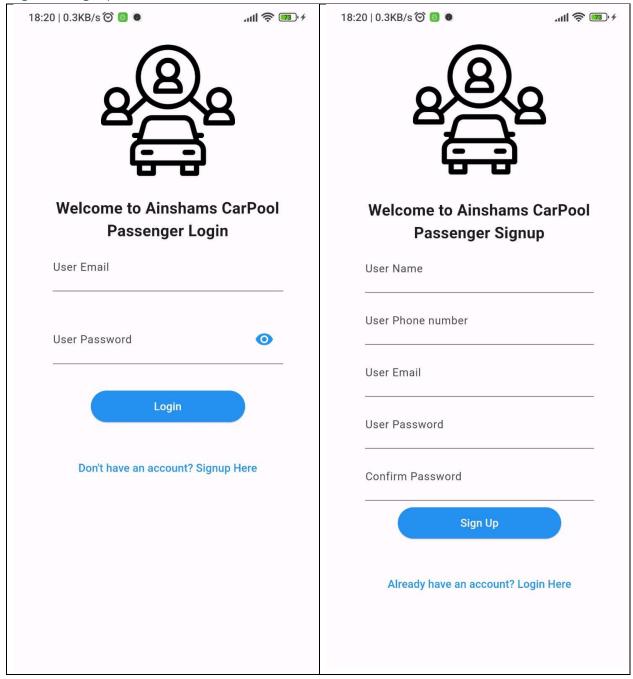


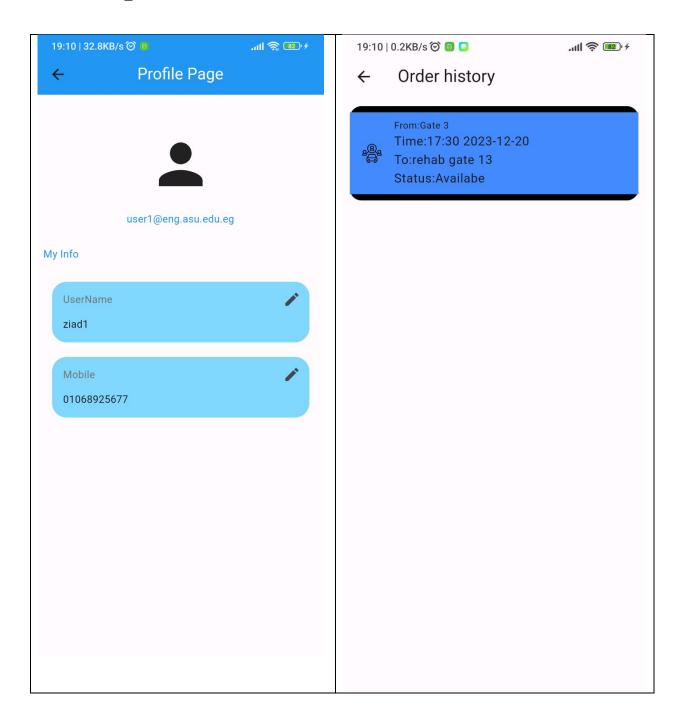
Review Your ride



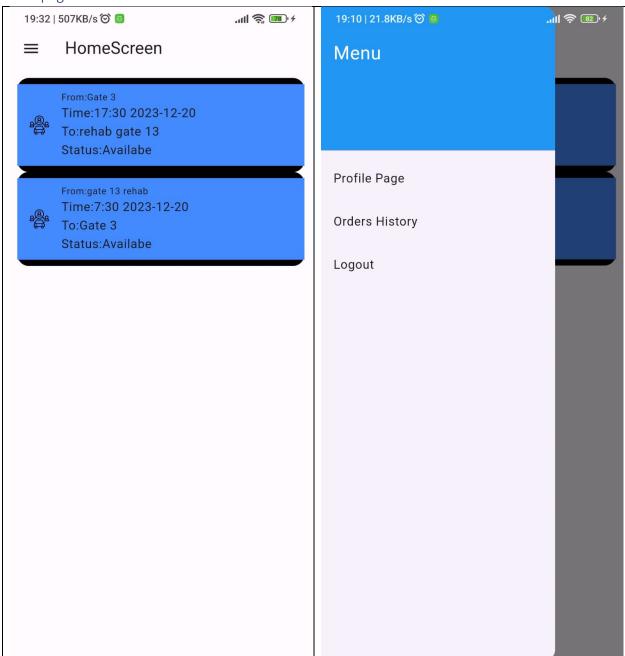
Passenger

Login and Signup screens





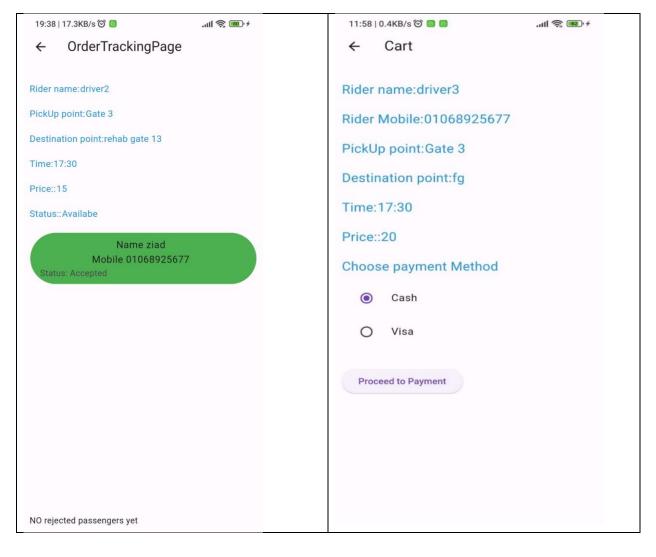
Homepage



Order_Tracking_page & Cart page

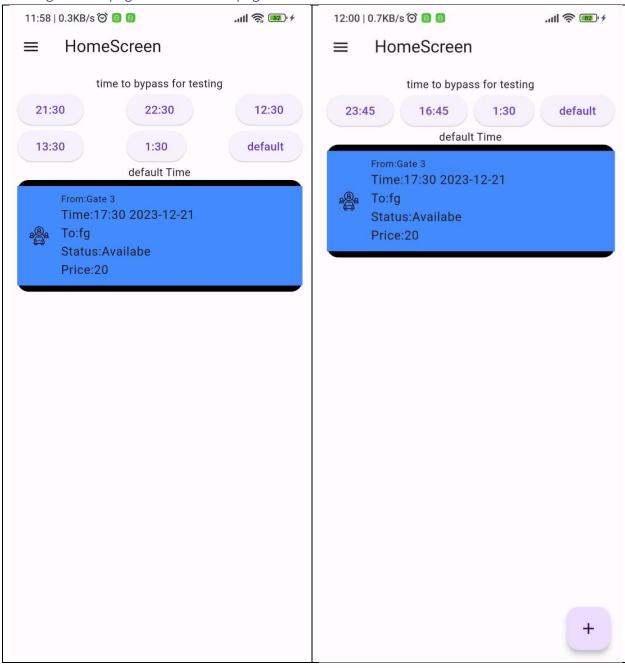
Order Tracking page

Cart_page



For Testing Layouts

Passenger Homepage & driver homepage



Database Structure

Local Database Structure

For Driver

Table:drivers

ID(primary key)	name	email	phone
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Table Name: drivers

Columns:

- id (TEXT, PRIMARY KEY): This column uniquely identifies each driver. It is mandatory and cannot be null.
- name (TEXT): This column stores the driver's name. It is also mandatory and cannot be null.
- email (TEXT): This column stores the driver's email address.
- phone (TEXT): This column stores the driver's phone number.

Additional Notes:

- The database file is named "DRIVERPROJECTDB" and is stored in the application's data directory.
- The database version is 1.
- The code includes functions to create the table, get all users, get a specific user by ID, and insert or update a user.

```
Future<Database?> mydbcheck() async {
Future<Database?> initiatingDatabase() async {
   Path,
  return mydatabase;
Future<List<Map<String, dynamic>>> getUsers() async {
 var response = await temp!.rawQuery('SELECT * FROM drivers');
Future<void> printTableContents() async {
  drivers.forEach((user) {
Future<List<Map<String, dynamic>>> getSpacificUser(String uid) async {
```

```
"'', [uid]);
    return response;
}

Future<void> InsertOrUpdateUser(var uid,String username,String mobile)
async {
    Database? temp = await mydbcheck();
    if(TESTMODE==0) {
        print("not storing tester values in local database");
        var response = await temp!.rawInsert('''
        INSERT OR REPLACE INTO drivers (id, name, phone)
        VALUES (?, ?, ?)
    ''', [uid, username, mobile]);
        // Print table contents after updating
        await printTableContents();
    }
    else {
        print("storing tester values in local database");
        var response = await temp!.rawInsert('''
        INSERT OR REPLACE INTO drivers (id, name, phone)
        VALUES (?, ?, ?)
    ''', ["TEST", username, mobile]);
        // Print table contents after updating
        await printTableContents();
    }
}
```

For passengers

Table:users

ID(primary key) name	email	phone
----------------------	-------	-------

Table Name: users

Columns:

- id (TEXT, PRIMARY KEY): This column uniquely identifies each user. It is mandatory and cannot be null.
- name (TEXT): This column stores the user's name.
- email (TEXT): This column stores the user's email address.
- phone (TEXT): This column stores the user's phone number.

Additional Notes:

- The database file is named "USERPROJECTDB" and is stored in the application's data directory.
- The database version is 1.
- The code includes functions to create the table, get all users, get a specific user by ID, and insert or update a user.

Differences from previous snippet:

- The table name changed from "drivers" to "users".
- The functions are named slightly differently (e.g., "getUsers" instead of "getUser").
- The functions seem to be used in the context of user profiles.

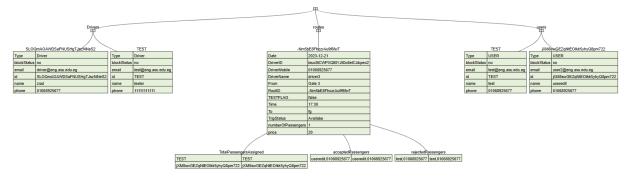
```
Future<Database?> mydbcheck() async {
Future<Database?> initiatingDatabase() async {
   Path,
  return mydatabase;
  var response = await temp!.rawQuery('SELECT * FROM users');
Future<void> printTableContents() async {
  var response = await temp!.rawQuery('''
```

```
SELECT * FROM users WHERE id = ?
''', [uid]);
return response;
}

Future<void> InsertOrUpdateUser(var uid,String username,String mobile)
async {
    Database? temp = await mydbcheck();
    if(TESTMODE==0) {
        var response = await temp!.rawInsert('''
        INSERT OR REPLACE INTO users (id, name, phone)
        VALUES (?, ?, ?)
''', [uid, username, mobile]);
        // Print table contents after updating
        await printTableContents();
    }
    else{
        var response = await temp!.rawInsert('''
        INSERT OR REPLACE INTO users (id, name, phone)
        VALUES (?, ?, ?)
''', ["TEST", username, mobile]);
        // Print table contents after updating
        await printTableContents();
    }
}
```

Remote Database Structure and code

Example at some instance



Code Authentication class For Passenger

```
ReusableMethods rMethods = ReusableMethods();
Future<int> Sign up(String emailTextEditingController
     await FirebaseAuth.instance.createUserWithEmailAndPassword(
        rMethods.displaySnakBar(errorMsg.toString(), context);
    DatabaseReference usersRef = FirebaseDatabase.instance.ref().child(
       "users").child(userFirebase!.uid);
      "id": userFirebase.uid,
       context, MaterialPageRoute(builder: (c) => MyScreen()));
    final User? userFirebase = (
          password: passwordTextEditingController,
        ).catchError((errorMsg) {
          rMethods.displaySnakBar(errorMsg.toString(), context);
```

Code Authentication class For Driver

```
ReusableMethods rMethods = ReusableMethods();
 Future<int> Sign up (String emailTextEditingController
      ,String passwordTextEditingController
         password: passwordTextEditingController,
          rMethods.displaySnakBar(errorMsq.toString(), context);
    if(emailTextEditingController.trim() != "test@eng.asu.edu.eg") {
      DatabaseReference DriverRef =
FirebaseDatabase.instance.ref().child("Drivers").child(userFirebase!.uid);
      DriverRef.set(driverDataMap);
     Navigator.pushReplacement(context, Material PageRoute(builder:
(c) =>MyScreen());
      print("saving Test Node in Database");
```

```
Navigator.pushReplacement(context, Material PageRoute(builder:
(c) =>MyScreen());
    final User? userFirebase = (
          password: passwordTextEditingController,
        ).catchError((errorMsg){
          rMethods.displaySnakBar(errorMsg.toString(), context);
    if(userFirebase != null){
      DatabaseReference DriverRef =
FirebaseDatabase.instance.ref().child("Drivers").child(userFirebase!.uid);
            Navigator.pushReplacementNamed(context, '/home screen');
```

```
}

Sign_out() async{
  await FirebaseAuth.instance.signOut();
}
```

Test Case scenarios

1) Group of test scenarios for sign-Up page

scenario 1.1:

- Open Application
- Go to sign-Up page
- Press sign Up button

EXPECTED: message "Name must be at least 4 characters"

scenario 1.2:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Press sign Up button

EXPECTED: message "Phone number must be at least 11 digits"

Scenario 1.3:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Enter valid Phone number with more than or equal 11 digits
- Press sign Up button

EXPECTED: message "Please sign up with ASU Domain email"

Scenario 1.4:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Enter valid Phone number with more than or equal 11 digits
- Enter Valid Email but not ASU domain
- Press sign Up button

EXPECTED: message "Please sign up with ASU Domain email"

Scenario 1.5:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Enter valid Phone number with more than or equal 11 digits
- Enter valid email address With ASU domain
- Press sign Up button

EXPECTED: message "Password must be atleast 6 characters"

Scenario 1.6:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Enter valid Phone number with more than or equal 11 digits
- Enter valid email address With ASU domain
- Enter valid password with more than or equal 11 characters
- Press sign Up button

EXPECTED: message "Confirm password is not the same"

Scenario 1.7:

- Open Application
- Go to sign-Up page
- Enter valid name with more than 3 characters
- Enter valid Phone number with more than or equal 11 digits
- Enter valid email address With ASU domain
- Enter valid password with more than or equal 11 characters
- Enter valid Confirm password equals the Password entered
- Press sign Up button

EXPECTED:

- Sign Up successfully
- Navigation to HomeScreen

2) Test case Login

Scenario 2.1 Entering empty fields

- Open Application
- Press Login

Expected Message "Please Login with ASU Domain Email"

Scenario 2.2 Enter valid data

- Open application
- Enter valid email and password
- Press Login

Expected

- Logged in successfully
- Navigated to HomePage

Scenario 2.3 enter Passenger account in Driver App

- Open Driver application
- Enter valid email and password but For passenger
- Press Login

Expected message "this account is nor Driver account"

Scenario 2.4 enter Driver account in Passenger App

- Open Passenger application
- Enter valid email and password but For driver
- Press Login

Expected message "this account is nor Passenger account"

2)Test case :Add ride For Driver

Scenario 2.1:

- Press Add Button
- Select date
- Select time
- Select Destination
- Enter pickup point
- -Enter Price
- Click Save Trip

Expected

- -Ride added to database with correct data
- -Navigated to homeScreen
- -Ride appears for passenger

Scenario 2.2

- -Press Add Button
- -Leave one or more fields empty

Expected

-Message "one or more fields empty"

3) Test case :Driver Navigate to profile Page

Scenario 3.1

- Make sure internet connection available
- Press menu button then select Profile Page

Expected:

- Email, username and mobile number appears and correct
- And the data retrieved from Remote database

Scenario 3.2

- Make sure internet connection is OFF
- Press menu button then select Profile Page

Expected

- Email, username and mobile number appears and correct

4) Test Case :Edit Profile Page

Scenario 4.1

- Click the field edit icon
- Enter a new String
- Click Save

Expected

- Field displayed with the edited text
- Field updated in firebase
- Field updated in local database

Scenario 4.2

- Click the field edit icon
- Enter a Empty
- Click Save

Expected

Message "field can't be empty"

Scenario 4.3

- Click the field edit icon
- Click Cancel button

Expected

- Back to profile Context

5) Test case: Driver Time Constrains

Scenario 5.1: prerequisite Ride Created with time 7:30 and multiple passengers request that ride

- Select time button 16:45(or any time before 23:30)
- Click on the target ride

Expected

- Driver can accept or reject passengers

Scenario 5.2: prerequisite Ride Created with time 7:30 and multiple passengers request that ride

- Select time button 23:45
- Click on the target ride

Expected

- All passengers that was pending have being rejected automatically
- Driver can't accept or reject passengers

Scenario 5.3: prerequisite Ride Created with time 17:30 and multiple passengers request that ride

- Select time button 1:30(or any time before 16:30)
- Click on the target ride

Expected

Driver can accept or reject passengers

Scenario 5.4: prerequisite Ride Created with time 17:30 and multiple passengers request that ride

- Select time button 16:45
- Click on the target ride

Expected

- All passengers that was pending have being rejected automatically
- Driver can't accept or reject passengers

6) Test Case: Logout for both drivers/passengers

Scenario 6.1

- Click menu button then select Logout

Expected

- Navigate to Login Screen
- Close the app when press back button

7) Test case Request ride in passenger App

Scenario 7.1

- Open Passenger App
- Select target ride
- Select payment method
- Press "proceed to payment"

Expected

- Passenger assigned to the route in database
- Navigate to home page
- Ride is added in order history page

Scenario 7.2 Ride is fullyBooked

- Open Passenger App
- Select target ride
- Select payment method
- Press "proceed to payment"

Expected message "this trip is FullyBooked"

8)Test case Accept/reject ride in Driver App

Scenario 8.1

- Open driver App
- Check specific ride
- Click Accept Button of specific request

Expected

- User request turned into green
- User request removed from pending requests
- routes node child acceptedPassengers has username and mobile
- routes node child passengers doesn't have username and mobile anymore
- routes node child total Assigned passengers has username and mobile
- routes node child noOfAcceptedPassengeres value increased by 1

Scenario 8.2

- Open driver App
- Check specific ride
- Click reject Button of specific request

Expected

- User request disappered
- User request removed from pending requests
- routes node child rejectedPassengers has username and mobile
- routes node child passengers doesn't have username and mobile anymore
- routes node child total Assigned passengers has username and mobile

Scenario 8.3 noOfAcceptedPassengeres value = 4

- Open driver App
- Check specific ride
- Click Accept Button of specific request

Expected

- Message "You already accepted 4 passengers"

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9)Test case Passenger check the assigned ride

Scenario 9.1 passenger accepted by driver at specific ride

- Open passenger App
- Press menu button and select order history
- Select specific ride

Expected

- See username and mobile and status accepted in green tile

Scenario 9.1 passenger rejected by driver at specific ride

- Open passenger App
- Press menu button and select order history
- Select specific ride

Expected

- See username and mobile and status rejected in red tile

10)Test case: Passenger Time Constrains on reserve a ride

Scenario 10.1 prerequisite ride at 7:30 In the next day is created

- Open passenger App
- Select bypass time to be 21:30

Expect

- To see the ride in homescreen normally
- Click on the ride
- Navigate to cart page normally

Scenario 10.2 prerequisite ride at 7:30 In the next day is created

- Open passenger App
- Select bypass time to be 22:30

Expected

- Do not see the ride in homescreen
- So passenger cant request it

Scenario 10.3 prerequisite ride at 17:30 In the same day is created

- Open passenger App
- Select bypass time to be 13:30

Expected

- Do not see the ride in homescreen

- So passenger cant request it

Scenario 10.4 prerequisite ride at 17:30 In the next day is created

- Open passenger App
- Select bypass time to be 12:30

Expect

- To see the ride in homescreen normally
- Click on the ride
- Navigate to cart page normally

Scenario 10.5 prerequisite ride at 7:30 In the next day is created

- Open passenger App
- Select bypass time to be 1:30

Expect

- Do not see the ride in homescreen
- So passenger can't request it

APK build

