SSN of Engineering, Kalavakkam – 603 110

Department of Computer Science and Engineering

Practical End Semester Examinations

Report generation completed

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Class: CSE -B

Semester : VI

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Student Mark Analysis System

1) Problem Statement:

For analyzing the marks obtained by the student in an educational institution, an app is built which will perform the mark analysis of each student.

Marks that are entered and processed manually are prone to errors and miscalculations. Changing errors in a record will lead to further changes and the process can be more tedious. Storing these data(records) is very hard and prone to damage. Transferring data from one record to another and performing further calculations may result in loss of data and errors. Retrieving data from these records is difficult.

This errors can be minimized with the help of this application. This application uses firebase as its backend. The student details along with mark obtained are stored in firebase in the form collection relations. In order to use this application we must register first. This application registration allows only authorized emails to ensure no other except the faculty can change the details of the student. After signing in, the faculty can edit the add student details to the database with the help of GUI integrated within the application in the form of form fields. After entering the marks of the student, his grade will automatically be displayed and stored in the database. Since this data is stored in google firebase server it can be accessed from anywhere merely with the help of the applications. Further this data can be easily retrieved, transferred, converted and performing calculations will also be easy.

2) classes:

Conceptual Class Category	**Class**
Transactions	addStudent, deleteStudent, updateStudent
roles of people	ModifyDetails
organizations	universityMails
Events	Login, Register, Modify
records	studentDetails
Documents	Report, markSheet
places	University

Association Category List:

New student is added to Database.

Student is removed from database.

Faculty modify student record.

Faculty add new student.

Many students in one class

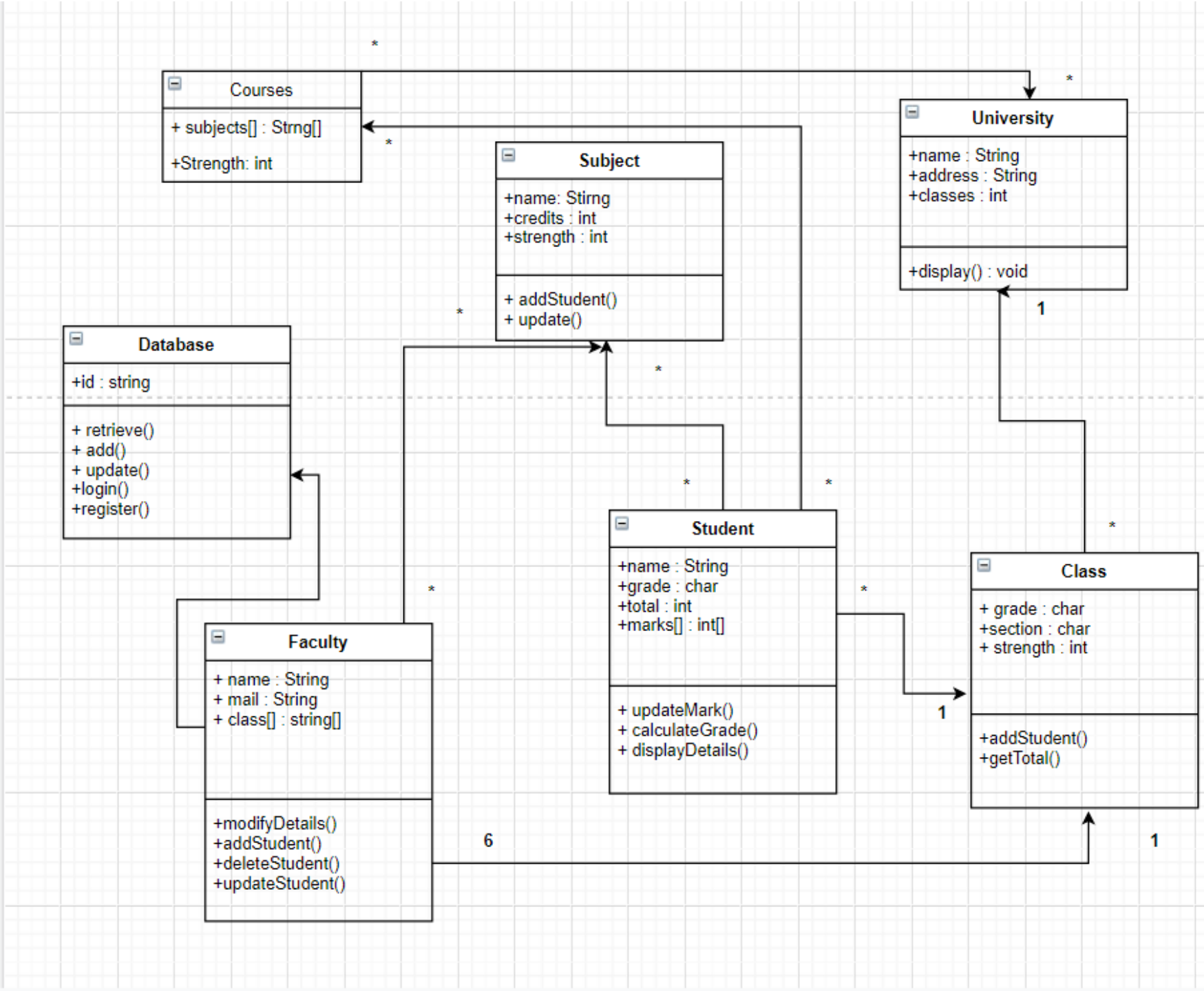
Many classes in a university

One teacher is assigned to many class

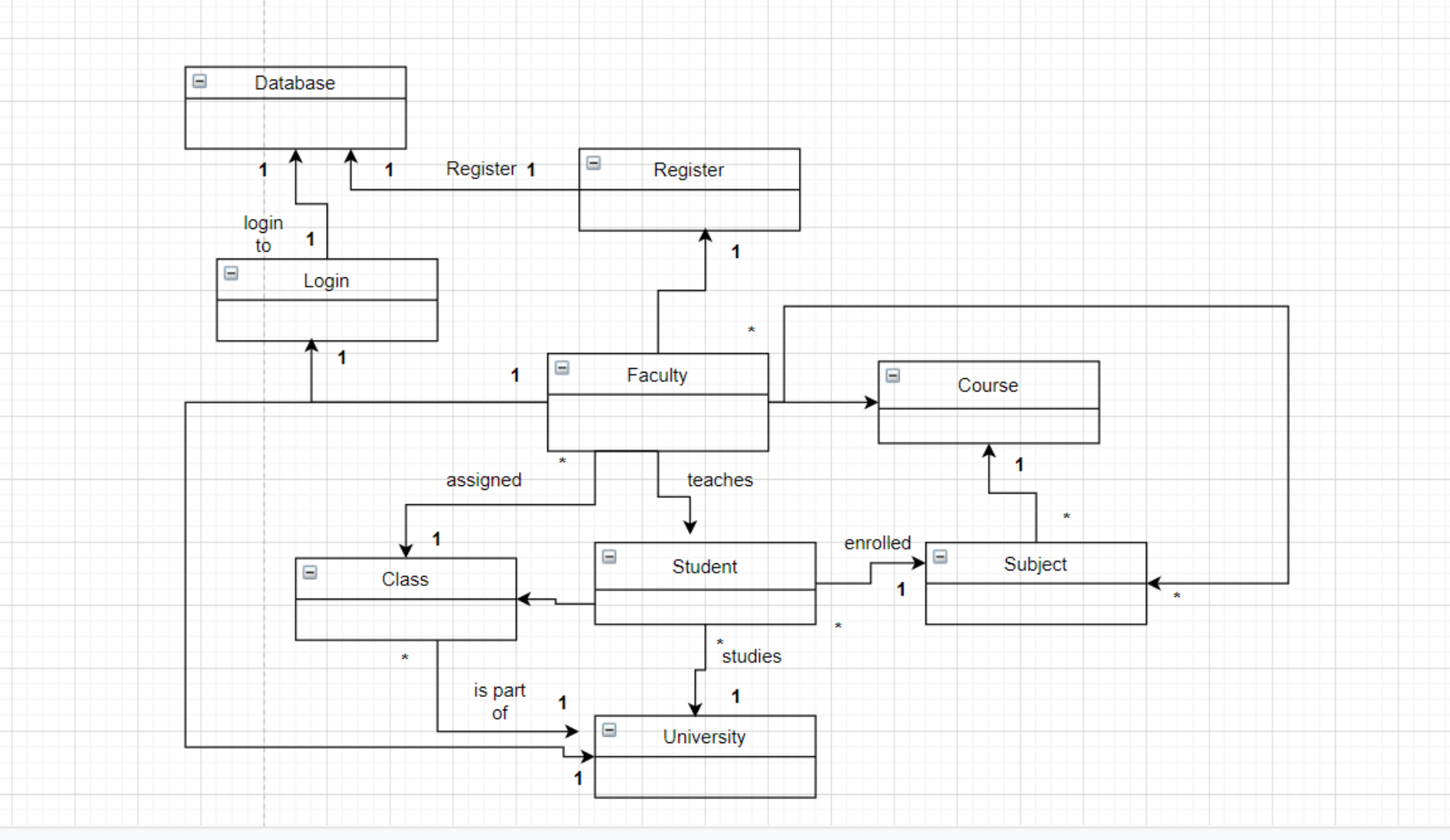
Six teachers is assigned to a single class

3) Class diagram:

Class diagram with association:


Courses
+ subjects[] : Strng[]
+Strength: int
Subject
+name: Stirng
+credits : int
+strength : int
+ addStudent()
+ update()
University
+name : String
+address : String
+classes : int
+display() : void
Database
+id : string
+ retrieve()
+ add()
+ update()
+login()
+register()
Student
+name : String
+grade : char
+total : int
+marks[] : int[]
+ updateMark()
+ calculateGrade()
+ displayDetails()
Class
+ grade : char
+section : char
+ strength : int
+addStudent()
+getTotal()
Faculty
+ name : String
+ mail : String
+ class[] : string[]
+modifyDetails()
+addStudent()
+deleteStudent()
+updateStudent()
*
1
6

Domain Model Diagram:



Test Cases:

Test Case Id	Test Scenario	Testing steps	Test Cases	Expected Outcomes	Actual Outcome	Pass/Fail
T101	Login user	1. Select Signin 2.Enter email and password 2. email and password validity	email: rahul123@gmail.com pasword: rahul121 Database: email: rahul123@gmail.com Password: rahul121	Login successful. Redirecting to Home page	Login successful. Redirected to Home page.	Pass
T102	Login user	1. Select Signin 2.Enter email and password 2. UserId and password validity	email: rahul567@gmail.com pasword: rahul121 Database: Username: no entry	Login failed. Stay in login page with error message.	Login failed. Stay in login page with error message.	pass
T103	Login user	1. Select Signin 2.Enter email and password 2. email and password validity	email: rahul123@gmail.com pasword: rahul121 Database: email: rahul123@gmail.com Password: rahul121	Login successful. Redirecting to Home page	Login successful. Redirected failed.	Fail
T104	Register user	1. Select Register 2. Enter email and password 3. Validate	email: rahul123@gmail.com pass: raghu120 Database: email: noentry	Register successful. Redirect to login page.	Register successful. Redirect to login page.	Pass
T105	Register user	1. Select Register 2. Enter email and password	email: rahul123@gmail.com pass: raghu120	Register unsuccessful.	Register unsuccessful. Redirect to register page with error message	pass

		3. Validate	email: username: Raghu120	Redirect to register page with error message.		
T106	Register User	1. Select Register 2. Enter email and password 3. Validate	email: rahul567@gmail.com pass: raghu120 Database: email: Raghu120	Register unsuccessful. Redirect to register page with error message.	Register successful. Redirect to login page.	Fail
T107	AddStudent	1. enter details 2. press add	regno : 101 database: regno : 101	Add student: unsuccessful Failed.	Add student: unsuccessful Failed.	pass
T107	AddStudent	1. enter details 2. press add	regno : 101 database: regno : no entry	Add student: successful Db updated.	Add student: successful Db updated.	pass

CODE:

Register.dart

```
import 'package:model_app/services/auth.dart';
import 'package:model_app/shared/constants.dart';
import 'package:flutter/material.dart';
import 'package:model_app/shared/loading.dart';

class Register extends StatefulWidget {
```

```
  final Function toggleView;
  Register({ this.toggleView });

  @override
  _RegisterState createState() => _RegisterState();
}

class _RegisterState extends State<Register> {

  final AuthService _auth = AuthService();
  final _formKey = GlobalKey<FormState>();
  bool loading = false;

  // text field state
  String email = '';
  String password = '';
  String error = '';

  @override
  Widget build(BuildContext context) {
    return loading ? Loading() : Scaffold(
      backgroundColor: Colors.brown[100],
      appBar: AppBar(
        backgroundColor: Colors.brown[400],
        elevation: 0.0,
        title: Text('Sign up to Mark Analysis App'),
        actions: [
          FlatButton.icon(
            onPressed: () {
              widget.toggleView();
            },
```

```
            icon: Icon(Icons.person),
            label: Text('Sign In'),
          )
        ],
      ),
      body: Container(
          padding: EdgeInsets.symmetric(vertical: 20.0, horizontal: 50.0),
          child: Form(
            key: _formKey,
            child: SingleChildScrollView(
              child: Column(
                children: [
                  SizedBox(height: 20.0),
                  TextFormField(
                    decoration: textInputDecoration.copyWith(hintText: 'Email'),
                    validator: (val) => val.isEmpty ? 'Enter an email' : null,
                    onChanged: (val) {
                      setState(() {
                        email = val;
                      });
                    },
                  ),
                  SizedBox(height: 20.0),
                  TextFormField(
                    decoration: textInputDecoration.copyWith(hintText: 'Password'),
                    obscureText: true,
                    validator: (val) => val.length < 6 ? 'Enter a password 6+ characters long' :
null,
                    onChanged: (val) {
                      setState(() {
```

```
                password = val;
              });
            },
          ),
          SizedBox(height: 20.0),
          RaisedButton(
            color: Colors.brown[400],
            child: Text(
              'Register',
              style: TextStyle(color: Colors.white),
            ),
            onPressed: () async {
              if (_formKey.currentState.validate()) {
                List<String> mails = ['rahul123@gmail.com', 'rahul@ssn.edu.in'];
                if (!mails.contains(email)) {
                  setState(() {
                    error = 'Unauthorized email';
                  });
                }
                else {
                  setState(() {
                    loading = true;
                  });
                  dynamic result = await _auth.reigisterWithEmailAndPassword(email,
password);

                  if (result == null) {
                    setState(() {
                      error = 'please supply valid email';
                      loading = false;
                    });
```

```
                        }
                      }
                    }
                  },
                ),
                SizedBox(height: 20.0,),
                Text(
                  error,
                  style: TextStyle(color: Colors.red, fontSize: 14.0),
                )
              ],
            ),
          ),
        )
      ),
    );
  }
}
```

Signin.dart:

```
import 'package:model_app/services/auth.dart';
import 'package:model_app/shared/constants.dart';
import 'package:model_app/shared/loading.dart';
import 'package:flutter/material.dart';

class SignIn extends StatefulWidget {

  final Function toggleView;
  SignIn({ this.toggleView });
```

```dart
  @override
  _SignInState createState() => _SignInState();
}

class _SignInState extends State<SignIn> {

  final AuthService _auth = AuthService();
  final _formKey = GlobalKey<FormState>();
  bool loading = false;

  // text field state
  String email = '';
  String password = '';
  String error = '';

  @override
  Widget build(BuildContext context) {
    return loading ? Loading() : Scaffold(
      backgroundColor: Colors.brown[100],
      appBar: AppBar(
        backgroundColor: Colors.brown[400],
        elevation: 0.0,
        title: Text('Sign in to Mark Analysis App'),
        actions: [
          FlatButton.icon(
            onPressed: () {
              widget.toggleView();
            },
            icon: Icon(Icons.person),
            label: Text('Register'),
          )
```

```
        ],
      ),
      body: Container(
          padding: EdgeInsets.symmetric(vertical: 20.0, horizontal: 50.0),
          child: Form(
            key: _formKey,
            child: SingleChildScrollView(
              child: Column(
                children: [
                  SizedBox(height: 20.0),
                  TextFormField(
                    decoration: textInputDecoration.copyWith(hintText: 'Email'),
                    validator: (val) => val.isEmpty ? 'Enter an email' : null,
                    onChanged: (val) {
                      setState(() {
                        email = val;
                      });
                    },
                  ),
                  SizedBox(height: 20.0),
                  TextFormField(
                    decoration: textInputDecoration.copyWith(hintText: 'Password'),
                    obscureText: true,
                    validator: (val) => val.length < 6 ? 'Enter a password 6+ characters long' :
null,

                    onChanged: (val) {
                      setState(() {
                        password = val;
                      });
                    },
```

```
    ),
    SizedBox(height: 20.0),
    RaisedButton(
      color: Colors.brown[400],
      child: Text(
        'Sign in',
        style: TextStyle(color: Colors.white),
      ),
      onPressed: () async {
        if (_formKey.currentState.validate()) {
          setState(() {
            loading = true;
          });
          dynamic result = await _auth.signInWithEmailAndPassword(email, password);
          if(result == null) {
            setState(() {
              error = 'Could not sign with those credentials';
              loading = false;
            });
          }
        }
      },
    ),
    SizedBox(height: 20.0,),
    Text(
      error,
      style: TextStyle(color: Colors.red, fontSize: 14.0),
    )
  ],
),
```

```
            ),
          )
      ),
    );
  }
}
```

Home.dart:

```dart
import 'package:model_app/input/add_student.dart';
import 'package:model_app/models.dart';
import 'package:model_app/services/auth.dart';
import 'package:flutter/material.dart';
import 'package:model_app/services/database.dart';
import 'package:provider/provider.dart';


class Home extends StatelessWidget {

  final AuthService _auth = AuthService();

  @override
  Widget build(BuildContext context) {

    //final user = Provider.of<FUser>(context);

    return Scaffold(
      backgroundColor: Colors.brown[50],
      appBar: AppBar(
        title: Text('Mark Analysis App'),
        backgroundColor: Colors.brown[400],
```

```
  elevation: 0.0,
  actions: [
    FlatButton.icon(
      onPressed: () async {
        await _auth.signOut();
      },
      icon: Icon(Icons.person),
      label: Text('logout'),
    ),
  ],
),
body: Container(
    padding: EdgeInsets.symmetric(vertical: 20.0, horizontal: 150.0),
  child: Column(
    children: [
      ElevatedButton(
          style: ButtonStyle(
            backgroundColor: MaterialStateProperty.all<Color>(Color(0xFF211F16)),
          ),
          onPressed: () async {
            Navigator.push(context,
                new MaterialPageRoute(
                    builder: (context) {
                      return AddStudent();
                    }
                )
            );
          },
          child: Text(
            'Add Student',
```

```
                style: TextStyle(color: Color(0xFFE8CE46)),
              )
          ),
          SizedBox(height: 30.0,),
          ElevatedButton(
              style: ButtonStyle(
                backgroundColor: MaterialStateProperty.all<Color>(Color(0xFF211F16)),
              ),
              onPressed: () async {
                Navigator.push(context,
                    new MaterialPageRoute(
                        builder: (context) {
                          return StreamProvider<List<StudentData>>.value(
                            value: DatabaseService().studentList,
                            child: Report(),
                          );
                        }
                    )
                );
              },
              child: Text(
                'View Student',
                style: TextStyle(color: Color(0xFFE8CE46)),
              )
          ),
        ],
      ),
    )
  );
}
```

```
}
```

AddStudent.dart:

```
import 'package:flutter/material.dart';
import 'package:model_app/services/database.dart';
import 'package:model_app/shared/constants.dart';
import 'package:toast/toast.dart';

class AddStudent extends StatefulWidget {
  @override
  _AddStudentState createState() => _AddStudentState();
}

class _AddStudentState extends State<AddStudent> {

  final _formKey = GlobalKey<FormState>();

  // input details
  String name;
  int regNo;
  int ip;
  int ml;
  int ooad;
  int fds;
  int ipr;
  int cd;


  @override
  Widget build(BuildContext context) {
```

```
return Scaffold(
  backgroundColor: Color(0xFFB9B5B5),
  appBar: AppBar(
    //automaticallyImplyLeading: !widget.isNew,
    backgroundColor: Color(0xFF211F16),
    elevation: 0.0,
    title: Text(
        'Add Student', style: TextStyle(color: Color(0xFFE8CE46))
    ),
  ),
  body: Container(
      padding: EdgeInsets.symmetric(vertical: 20.0, horizontal: 50.0),
      child: Form(
        key: _formKey,
        child: SingleChildScrollView(
          child: Column(
            children: [
              SizedBox(height: 20.0),
              Align(
                alignment: Alignment.centerLeft,
                child: Container(
                  child: Text(
                    "Full Name",
                  ),
                ),
              ),
              SizedBox(height: 10.0),
              TextFormField(
                decoration: textInputDecoration.copyWith(hintText: 'Name'),
                validator: (val) => val.length == 0 ? 'Enter valid Name' : null,
```

```
    onChanged: (val) {
      setState(() {
        name = val;
      });
    },
  ),
  SizedBox(height: 20.0),

  TextFormField(
    decoration: textInputDecoration.copyWith(hintText: 'Register Number'),
    keyboardType: TextInputType.number,
    validator: (val) => val.length != 3 ? 'Enter valid register number' : null,
    onChanged: (val) {
      setState(() {
        regNo = int.parse(val);
      });
    },
  ),
  SizedBox(height: 20.0),
  Align(
    alignment: Alignment.centerLeft,
    child: Container(
      child: Text(
        "Enter Marks : ",
      ),
    ),
  ),
  SizedBox(height: 20.0),
  TextFormField(
    decoration: textInputDecoration.copyWith(hintText: 'Internet programming'),
```

```
                  keyboardType: TextInputType.number,
                  validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                  onChanged: (val) {
                    setState(() {
                      ip = int.parse(val);
                    });
                  },
                ),
                SizedBox(height: 20.0),

                TextFormField(
                  decoration: textInputDecoration.copyWith(hintText: 'Compiler Design'),
                  keyboardType: TextInputType.number,
                  validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                  onChanged: (val) {
                    setState(() {
                     cd = int.parse(val);
                    });
                  },
                ),
                SizedBox(height: 20.0),

                TextFormField(
                  decoration: textInputDecoration.copyWith(hintText: 'Machine Learning'),
                  keyboardType: TextInputType.number,
                  validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                  onChanged: (val) {
                    setState(() {
```

```
                    ml = int.parse(val);
                  });
                },
              ),
              SizedBox(height: 20.0),

              TextFormField(
                decoration: textInputDecoration.copyWith(hintText: 'OO Analysis and Design'),
                keyboardType: TextInputType.number,
                validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                onChanged: (val) {
                  setState(() {
                    ooad = int.parse(val);
                  });
                },
              ),
              SizedBox(height: 20.0),

              TextFormField(
                decoration: textInputDecoration.copyWith(hintText: 'Data Science'),
                keyboardType: TextInputType.number,
                validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                onChanged: (val) {
                  setState(() {
                    fds = int.parse(val);
                  });
                },
              ),
              SizedBox(height: 20.0),
```

```
                TextFormField(
                  decoration: textInputDecoration.copyWith(hintText: 'IPR'),
                  keyboardType: TextInputType.number,
                  validator: (val) => int.parse(val) > 100 || int.parse(val) < 0 ? 'Enter valid
mark' : null,
                  onChanged: (val) {
                    setState(() {
                      ipr = int.parse(val);
                    });
                  },
                ),
                SizedBox(height: 20.0),
                ElevatedButton(
                    style: ButtonStyle(
                      backgroundColor: MaterialStateProperty.all<Color>(Color(0xFF211F16)),
                    ),
                    onPressed: () async {
                      print(name);
                      if(_formKey.currentState.validate()) {
                        await DatabaseService().updateStudentData(name, regNo, ip, cd, ml, ooad,
fds, ipr);
                      }
                      Toast.show(
                          "Student Details Added",
                          context,
                          duration: 3,
                          gravity:  Toast.BOTTOM
                      );
                      Navigator.pop(context);
```

```
                    },
                    child: Text(
                      'Add',
                      style: TextStyle(color: Color(0xFFE8CE46)),
                    )
                  ),
                ],
              ),
            ),
          )
      ),
    );
  }
}
```

database.dart:

```
import 'package:model_app/models.dart';
import 'package:cloud_firestore/cloud_firestore.dart';
import 'package:firebase_auth/firebase_auth.dart';

class DatabaseService {

  // collection reference
  // once created - won't create another just give the reference
  final CollectionReference studentCollection = FirebaseFirestore.instance.collection('students');

  Future updateStudentData(String name, int regNo, int ip, int cd, int ml, int ooad, int fds, int
ipr) async {
    return await studentCollection.doc(regNo.toString()).set({
      'name' : name,
```

```
    'reg_no' : regNo,
    'ip' : ip,
    'cd' : cd,
    'ml' : ml,
    'ooad' : ooad,
    'fds' : fds,
    'ipr' : ipr,
  });
}

List<StudentData> _studentListFromSnapshot(QuerySnapshot snapshots) {
  return snapshots.docs.map((doc) {
    return _studentDataFromSnapshot(doc);
  }).toList();
}

// userData from snapshots
StudentData _studentDataFromSnapshot(DocumentSnapshot snapshot) {
  return StudentData(
    name: snapshot.data()['name'],
    regNo : snapshot.data()['regNo'],
    ip : snapshot.data()['ip'],
    cd : snapshot.data()['cd'],
    ml : snapshot.data()['ml'],
    ooad : snapshot.data()['ooad'],
    fds : snapshot.data()['fds'],
    ipr: snapshot.data()['ipr'],
  );
}

// get user doc stream
```

```dart
  Stream<List<StudentData>> get studentList {
    return studentCollection.snapshots().map( _studentListFromSnapshot);
  }

}
```

auth.dart:

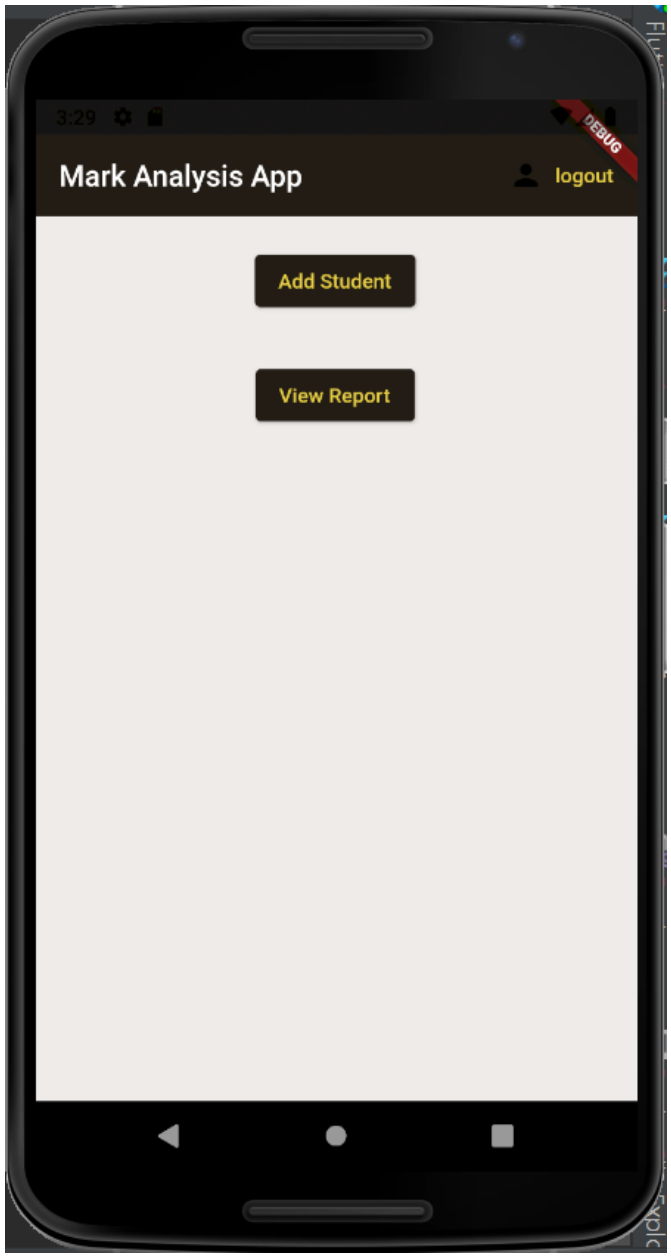
```dart
import 'package:model_app/models.dart';
import 'package:model_app/services/database.dart';
import 'package:firebase_auth/firebase_auth.dart';

class AuthService {

  final FirebaseAuth _auth = FirebaseAuth.instance;

  // create FUser obj based on User
  FUser _userFromUser(User user ) {
    return user != null ? FUser(uid: user.uid) : null;
  }

  // auth change user stream
  Stream<FUser> get user {
    //return _auth.authStateChanges().map(_userFromUser);
    return _auth.authStateChanges().map((User user) => _userFromUser(user));
  }

  // sign in anon
  Future signInAnon() async {
    try {
```

```
      UserCredential userCredential = await _auth.signInAnonymously();
      User user = userCredential.user;
      return _userFromUser(user);
    } catch(e) {
      print(e.toString());
      return null;
    }
  }

  // sign in with email and password
  Future signInWithEmailAndPassword(String email, String password) async {
    try {
      UserCredential userCredential = await _auth.signInWithEmailAndPassword(email: email,
password: password);
      User user = userCredential.user;
      return _userFromUser(user);
    } catch(e) {
      print(e.toString());
      return null;
    }
  }

  // register with email and password
  Future reigisterWithEmailAndPassword(String email, String password) async {
    try {
      UserCredential userCredential = await _auth.createUserWithEmailAndPassword(email: email,
password: password);
      User user = userCredential.user;

      // create a new document for the user with the uid
      //await DatabaseService(uid: user.uid).updateUserData('0', 'new crew member', 100);
```

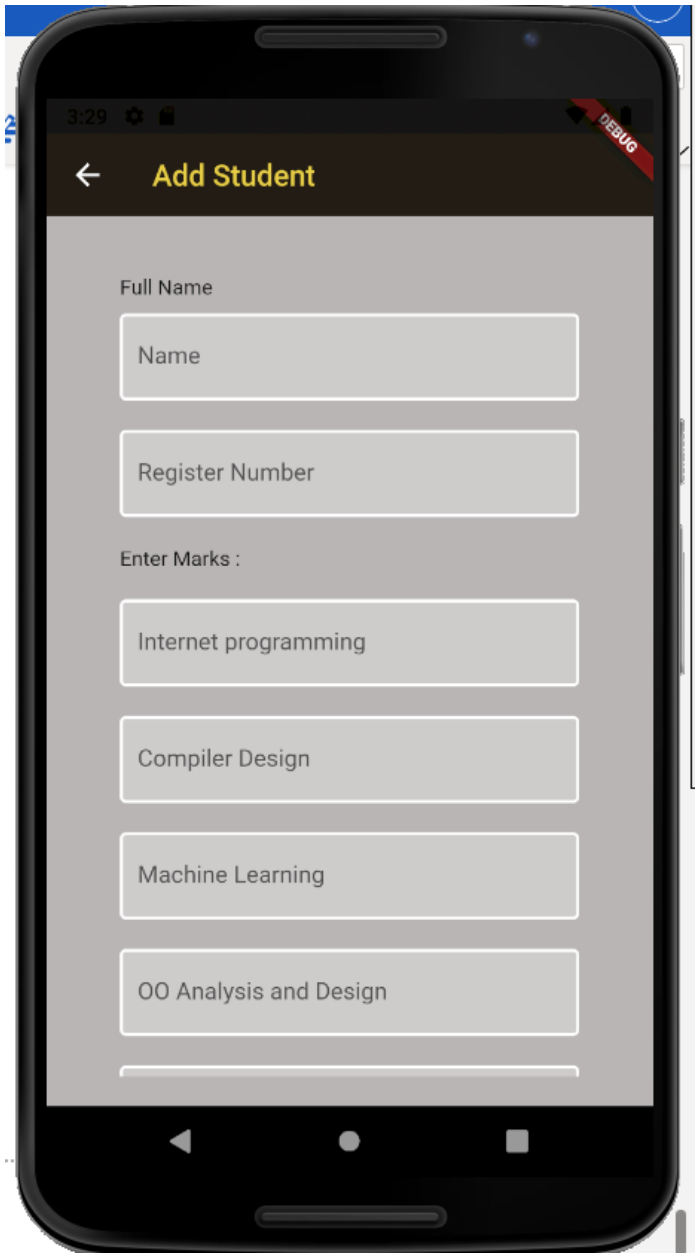
```
      return _userFromUser(user);
    } catch(e) {
      print(e.toString());
      return null;
    }
  }

  // sign out
  Future signOut() async {
    try{
      return await _auth.signOut();
    } catch(e) {
      print(e.toString());
      return null;
    }
  }

}
```

Screenshots:

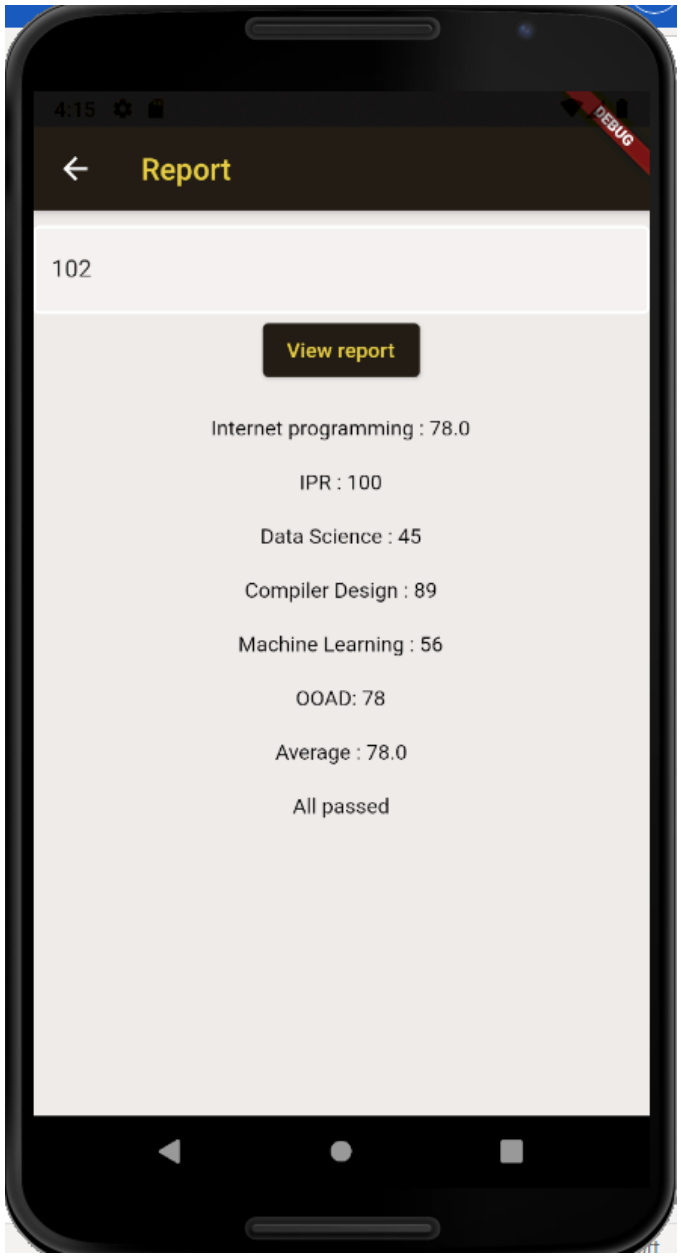
Home page:


3:29
DEBUG
Mark Analysis App
logout
Add Student
View Report

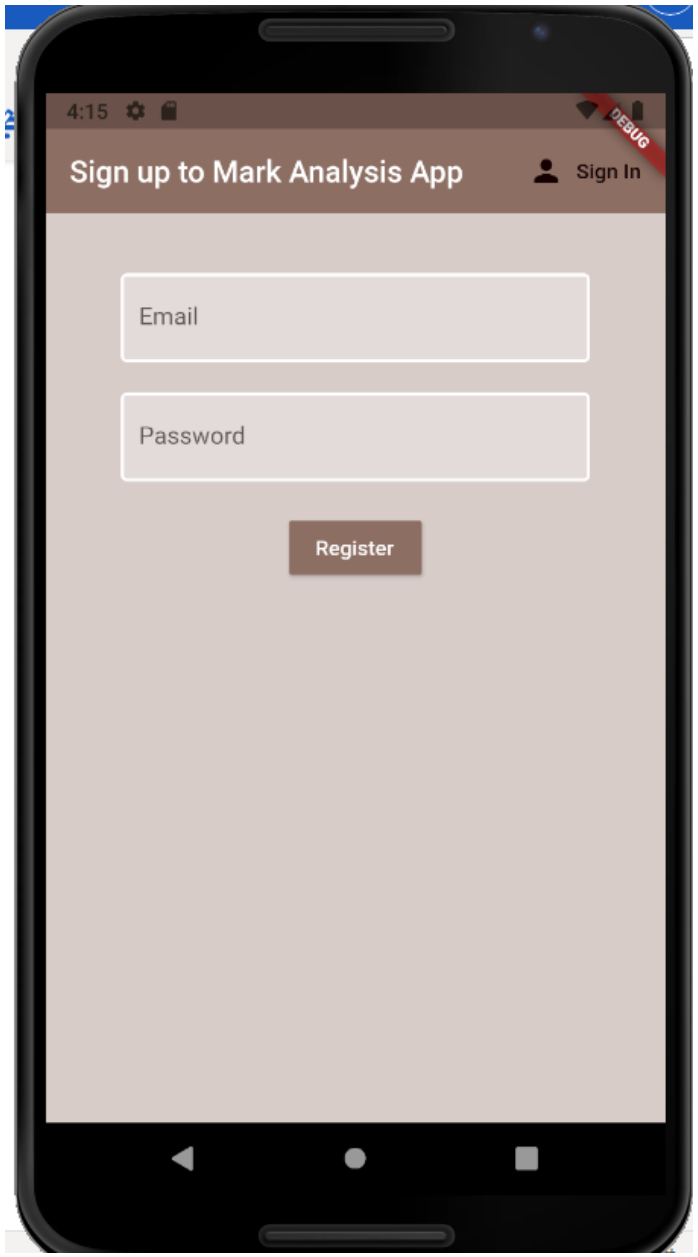
Add Student:


3:29
DEBUG
Add Student
Full Name
Name
Register Number
Enter Marks :
Internet programming
Compiler Design
Machine Learning
OO Analysis and Design

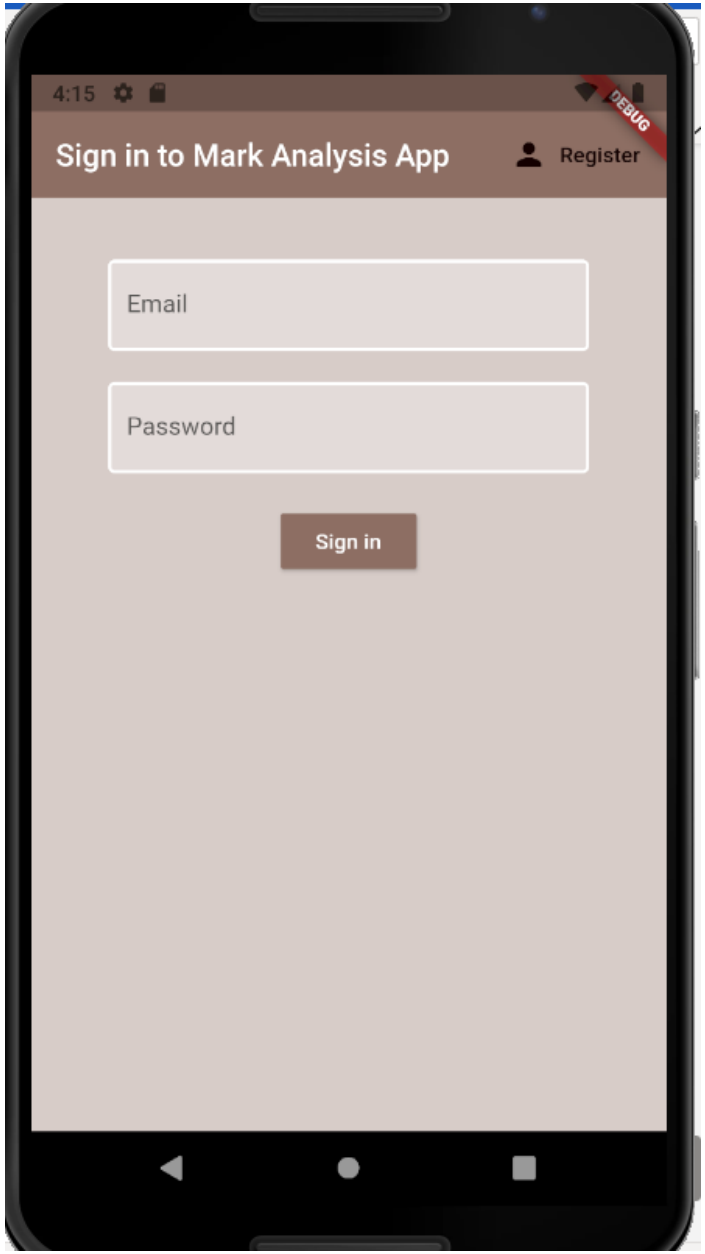
report:


4:15
DEBUG
Report
102
View report
Internet programming : 78.0
IPR : 100
Data Science : 45
Compiler Design : 89
Machine Learning : 56
OOAD: 78
Average : 78.0
All passed

Login in:


4:15
DEBUG
Sign up to Mark Analysis App
Sign In
Email
Password
Register

Signin: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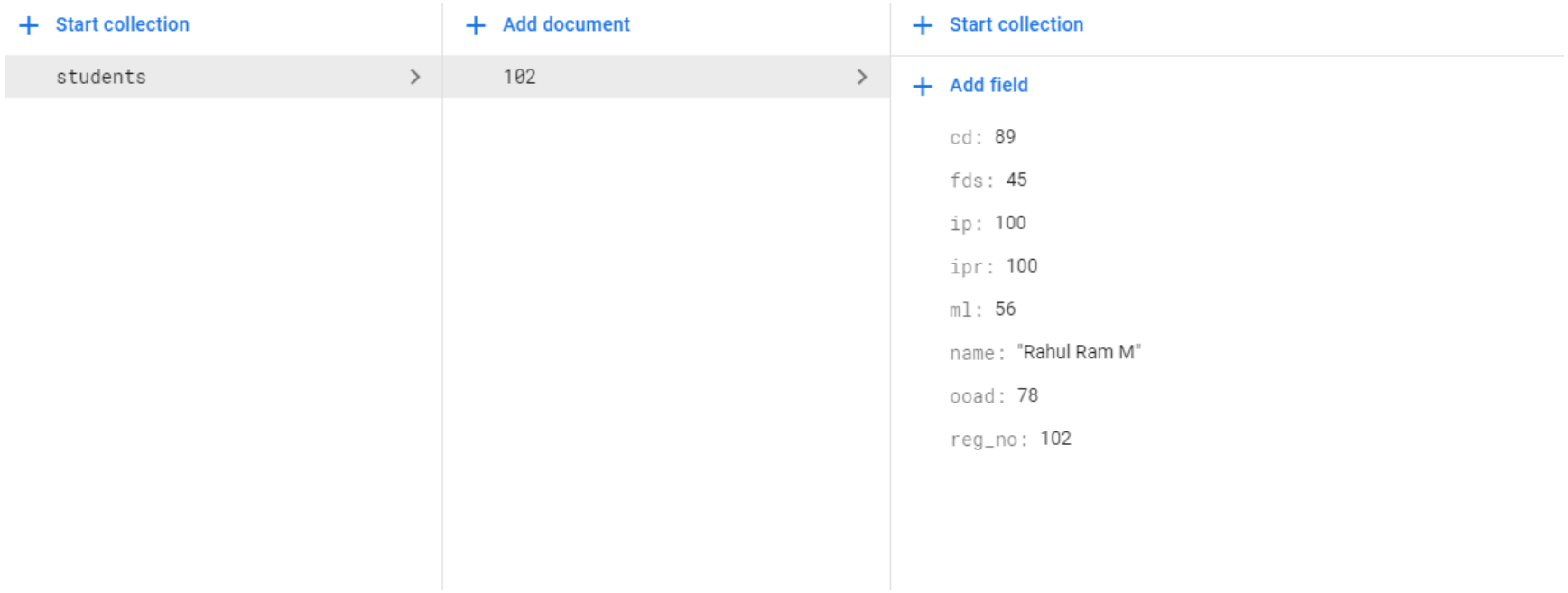
DEBUG
Sign in to Mark Analysis App
Register
Email
Password
Sign in

DataBase: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students
Add document
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Add field
cd: 89
fds: 45
ip: 100
ipr: 100
ml: 56
name: "Rahul Ram M"
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reg_no: 102