Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

Experiment	8
Aim	Implement user authentication and registration using database with flutter
Objective	- Create Registration page - Create database - Store, fetch, delete values from database. - User Authentication from database
Name	Iffat Patel
UCID	2024510041
Class	FYMCA
Batch	B
Date of Submission	

Technology used	**flutter , superbase , vscode**
Task	Create a basic registration page and store data n database. Fetch and also delete few entries from database. You can use either firebase database or postgresql.

Code with proper label	**main.dart**
	`class Profile {`
	`  final String id;`
	`  final String email;`
	`  final String? username;`
	`  final String? avatarUrl;`
	`  final DateTime createdAt;`
	`  final DateTime? updatedAt;`
	
	`  Profile({`
	`    required this.id,`
	`    required this.email,`
	`    this.username,`
	`    this.avatarUrl,`
	`    required this.createdAt,`
	`    this.updatedAt,`
	`  });`
	
	`  factory Profile.fromJson(Map<String, dynamic> json) {`
	`    return Profile(`
	`      id: json['id'] as String,`
	`      email: json['email'] as String,`
	`      username: json['username'] as String?,`
	`      avatarUrl: json['avatar_url'] as String?,`
	`      createdAt: DateTime.parse(json['created_at'] as String),`
	`      updatedAt:`
	`        json['updated_at'] == null`
	`          ? null`

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
        : DateTime.parse(json['updated_at'] as String),
    );
  }

  Map<String, dynamic> toJson() {
    return {
      'id': id,
      'email': email,
      'username': username,
      'avatar_url': avatarUrl,
      'created_at': createdAt.toIso8601String(),
      'updated_at': updatedAt?.toIso8601String(),
    };
  }

  Profile copyWith({
    String? id,
    String? email,
    // Allow null for username/avatarUrl to clear them
    ValueGetter<String?>? username,
    ValueGetter<String?>? avatarUrl,
    DateTime? createdAt,
    ValueGetter<DateTime?>? updatedAt,
  }) {
    return Profile(
      id: id ?? this.id,
      email: email ?? this.email,
      username: username != null ? username() : this.username,
      avatarUrl: avatarUrl != null ? avatarUrl() : this.avatarUrl,
      createdAt: createdAt ?? this.createdAt,
      updatedAt: updatedAt != null ? updatedAt() : this.updatedAt,
    );
  }
}

// Helper for copyWith to handle nullable fields correctly
typedef ValueGetter<T> = T Function();
```

profile.dart

```dart
class Profile {
  final String id;
  final String email;
  final String? username;
  final String? avatarUrl;
  final DateTime createdAt;
  final DateTime? updatedAt;

  Profile({
    required this.id,
    required this.email,
    this.username,
    this.avatarUrl,
    required this.createdAt,
    this.updatedAt,
  });
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
  factory Profile.fromJson(Map<String, dynamic> json) {
    return Profile(
      id: json['id'] as String,
      email: json['email'] as String,
      username: json['username'] as String?,
      avatarUrl: json['avatar_url'] as String?,
      createdAt: DateTime.parse(json['created_at'] as String),
      updatedAt:
          json['updated_at'] == null
              ? null
              : DateTime.parse(json['updated_at'] as String),
    );
  }

  Map<String, dynamic> toJson() {
    return {
      'id': id,
      'email': email,
      'username': username,
      'avatar_url': avatarUrl,
      'created_at': createdAt.toIso8601String(),
      'updated_at': updatedAt?.toIso8601String(),
    };
  }

  Profile copyWith({
    String? id,
    String? email,
    // Allow null for username/avatarUrl to clear them
    ValueGetter<String?>? username,
    ValueGetter<String?>? avatarUrl,
    DateTime? createdAt,
    ValueGetter<DateTime?>? updatedAt,
  }) {
    return Profile(
      id: id ?? this.id,
      email: email ?? this.email,
      username: username != null ? username() : this.username,
      avatarUrl: avatarUrl != null ? avatarUrl() : this.avatarUrl,
      createdAt: createdAt ?? this.createdAt,
      updatedAt: updatedAt != null ? updatedAt() : this.updatedAt,
    );
  }
}

// Helper for copyWith to handle nullable fields correctly
typedef ValueGetter<T> = T Function();
```

todo.dart

```dart
class Todo {
  final String id;
  final String userId;
  final String title;
  final String? description;
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
final bool isComplete;
final DateTime createdAt;
final DateTime? updatedAt;

Todo({
  required this.id,
  required this.userId,
  required this.title,
  this.description,
  required this.isComplete,
  required this.createdAt,
  this.updatedAt,
});

factory Todo.fromJson(Map<String, dynamic> json) {
  return Todo(
    id: json['id'] as String,
    userId: json['user_id'] as String,
    title: json['title'] as String,
    description: json['description'] as String?,
    isComplete: json['is_complete'] as bool,
    createdAt: DateTime.parse(json['created_at'] as String),
    updatedAt:
        json['updated_at'] == null
            ? null
            : DateTime.parse(json['updated_at'] as String),
  );
}

Map<String, dynamic> toJson() {
  return {
  // 'id': id, // Usually not sent for insert/update unless specifically needed
  // 'user_id': userId, // Usually not sent for insert/update unless specifically needed
    'title': title,
    'description': description,
    'is_complete': isComplete,
  // 'created_at': createdAt.toIso8601String(), // Handled by Supabase
  // 'updated_at': updatedAt?.toIso8601String(), // Handled by Supabase
  };
}

Todo copyWith({
  String? id,
  String? userId,
  String? title,
  ValueGetter<String?>? description,
  bool? isComplete,
  DateTime? createdAt,
  ValueGetter<DateTime?>? updatedAt,
}) {
  return Todo(
    id: id ?? this.id,
    userId: userId ?? this.userId,
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
      title: title ?? this.title,
      description: description != null ? description() : this.description,
      isComplete: isComplete ?? this.isComplete,
      createdAt: createdAt ?? this.createdAt,
      updatedAt: updatedAt != null ? updatedAt() : this.updatedAt,
    );
  }
}

// Helper for copyWith
typedef ValueGetter<T> = T Function();
```
auth_provider.dart
```dart
import 'dart:async';
import 'package:flutter/material.dart';
import 'package:supabase_flutter/supabase_flutter.dart';
import 'package:todo/models/profile.dart';
import 'package:todo/services/supabase_service.dart';

class AuthProvider extends ChangeNotifier {
  final SupabaseService _supabaseService = SupabaseService();
  Profile? _profile;
  bool _isLoading = false;
  String? _error;
  bool _profileCreationAttempted =
      false; // Flag to prevent multiple creation attempts per session

  StreamSubscription<AuthState>? _authStateSubscription;

  Profile? get profile => _profile;
  bool get isLoading => _isLoading;
  String? get error => _error;
  bool get isAuthenticated => _supabaseService.currentUser != null;

  AuthProvider() {
    _initializeAuth();
  }

  void _initializeAuth() {
    _authStateSubscription = _supabaseService.authStateChanges.listen((
      AuthState state,
    ) async {
      final event = state.event;
      final session = state.session;

      _setLoading(true);

      if (event == AuthChangeEvent.signedIn) {
        _profileCreationAttempted = false; // Reset flag on new sign-in
        print(
          "AuthProvider: AuthChangeEvent.signedIn detected for user
${session?.user?.id}.",
        );
        if (session?.user != null) {
          await _handleUserSignedIn(session!.user!);
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
      } else {
        print("AuthProvider: SignedIn event but session or user is null.");
        _profile = null;
        _setError("Sign-in event occurred, but user data is missing.");
      }
    } else if (event == AuthChangeEvent.signedOut) {
      print("AuthProvider: AuthChangeEvent.signedOut detected.");
      _profile = null;
      _profileCreationAttempted = false; // Reset flag
      _setError(null);
    } else if (event == AuthChangeEvent.userUpdated) {
      print("AuthProvider: AuthChangeEvent.userUpdated detected.");
      if (session?.user != null && isAuthenticated) {
        await _loadProfile();
      }
    } else if (event == AuthChangeEvent.passwordRecovery) {
      print("AuthProvider: AuthChangeEvent.passwordRecovery detected.");
    } else if (event == AuthChangeEvent.tokenRefreshed) {
      print("AuthProvider: AuthChangeEvent.tokenRefreshed detected.");
    }

    _setLoading(false);
  });

  Future.microtask(() async {
    final currentUser = _supabaseService.currentUser;
    if (currentUser != null) {
     if (!_isLoading && _profile == null) {
       print(
         "AuthProvider: Initial check (deferred) - user ${currentUser.id} is
authenticated. Handling sign-in.",
       );
       await _handleUserSignedIn(currentUser);
     }
    } else {
     print(
       "AuthProvider: Initial check (deferred) - user is not authenticated.",
     );
     if (!_isLoading) _setLoading(false);
    }
  });
}

@override
void dispose() {
  _authStateSubscription?.cancel();
  super.dispose();
}

Future<void> _handleUserSignedIn(User user) async {
  _setLoading(true);
  _setError(null);
  try {
    print(
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
      "_handleUserSignedIn: Attempting to get profile for user ${user.id}",
    );
    Profile? existingProfile = await _supabaseService.getProfile();

    if (existingProfile == null) {
      print("_handleUserSignedIn: Profile not found for user ${user.id}.");
      if (user.email != null && user.email!.isNotEmpty) {
        if (!_profileCreationAttempted) {
          _profileCreationAttempted = true; // Mark that we're attempting it
          print(
            "_handleUserSignedIn: Attempting to create new profile for
${user.email} (user ID: ${user.id}).",
          );
          try {
            await _supabaseService.createProfile(email: user.email!);
            print(
              "_handleUserSignedIn: Profile creation call completed for ${user.id}.
Re-fetching profile.",
            );
            // Crucial: Re-fetch profile after attempting creation
            existingProfile = await _supabaseService.getProfile();
            if (existingProfile == null) {
              print(
                "_handleUserSignedIn: CRITICAL - Profile still not found after
creation attempt for ${user.id}. CHECK RLS ON 'profiles' table (INSERT and
SELECT).",
              );
              _setError(
                "Failed to create or load profile after sign-in. Please try signing out
and in again. If persist, check RLS.",
              );
              _profile = null; // Ensure profile is null
            } else {
              print(
                "_handleUserSignedIn: New profile created and loaded successfully
for ${user.id}.",
              );
              _profile = existingProfile;
            }
          } catch (e) {
            print(
              "_handleUserSignedIn: ERROR during _supabaseService.createProfile
for user ${user.id}: $e",
            );
            _setError(
              "Error creating profile: $e. Check RLS on 'profiles' table.",
            );
            _profile = null; // Ensure profile is null
          }
        } else {
          print(
            "_handleUserSignedIn: Profile creation already attempted for user
${user.id} in this session, not retrying to avoid loops.",
          );
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                // Potentially set an error or rely on user to sign out/in
                _setError(
                  "Profile not found and creation already attempted. Please sign out and
sign in again.",
                );
                _profile = null;
              }
            } else {
              _setError(
                "User signed in (ID: ${user.id}), but email is not available to create a
profile.",
              );
              _profile = null;
            }
          } else {
            print(
              "_handleUserSignedIn: Existing profile loaded for user ${user.id}.",
            );
            _profile = existingProfile;
          }
        } catch (e) {
          _setError("Error handling user sign-in or profile: ${e.toString()}");
          print("_handleUserSignedIn: General Exception: ${e.toString()}");
          _profile = null;
        } finally {
          _setLoading(false);
        }
      }

  Future<void> _loadProfile() async {
    // This is mostly for explicit reloads, _handleUserSignedIn should manage
initial load
    _setLoading(true);
    _setError(null);
    try {
      _profile = await _supabaseService.getProfile();
      if (_profile == null && isAuthenticated) {
        print(
          "_loadProfile: Profile is null for an authenticated user. Triggering
_handleUserSignedIn.",
        );
        // If profile is unexpectedly null for an authenticated user, try to
recover/create it.
        final currentUser = _supabaseService.currentUser;
        if (currentUser != null) {
          await _handleUserSignedIn(currentUser);
        }
      }
    } catch (e) {
      _setError(e.toString());
      _profile = null;
    } finally {
      _setLoading(false);
    }
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
  }

  Future<bool> signUp({required String email, required String password}) async
{
    _setLoading(true);
    _setError(null);
    try {
      final response = await _supabaseService.signUp(
        email: email,
        password: password,
      );
      // AuthChangeEvent.signedIn will trigger _handleUserSignedIn for profile
creation
      return response.user != null;
    } catch (e) {
      _setError(e.toString());
      return false;
    } finally {
      _setLoading(false);
    }
  }

  Future<bool> signIn({required String email, required String password}) async
{
    _setLoading(true);
    _setError(null);
    try {
      final response = await _supabaseService.signIn(
        email: email,
        password: password,
      );
      // AuthChangeEvent.signedIn will trigger _handleUserSignedIn
      return response.user != null;
    } catch (e) {
      _setError(e.toString());
      return false;
    } finally {
      _setLoading(false);
    }
  }

  Future<bool> signInWithGoogle() async {
    _setLoading(true);
    _setError(null);
    try {
      final bool initiated = await _supabaseService.signInWithGoogle();
      // If initiated, AuthChangeEvent.signedIn will handle the rest via OAuth
callback
      if (!initiated)
        _setLoading(false); // Only set loading false if initiation failed
      return initiated;
    } catch (e) {
      _setError(e.toString());
      _setLoading(false);
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
      return false;
    }
  }

  Future<void> signOut() async {
    _setLoading(true);
    _setError(null);
    try {
      await _supabaseService.signOut();
      // AuthChangeEvent.signedOut will clear profile and set loading to false
    } catch (e) {
      _setError(e.toString());
      _setLoading(false);
    }
  }

  Future<void> updateProfile({String? username, String? avatarUrl}) async {
    _setLoading(true);
    _setError(null);
    try {
      await _supabaseService.updateProfile(
        username: username,
        avatarUrl: avatarUrl,
      );
      await _loadProfile(); // Reload profile to reflect changes
    } catch (e) {
      _setError(e.toString());
    } finally {
      _setLoading(false);
    }
  }

  void _setLoading(bool value) {
    if (_isLoading == value) return;
    _isLoading = value;
    notifyListeners();
  }

  void _setError(String? value) {
    if (_error == value) return;
    _error = value;
    notifyListeners();
  }
}
```

todo_provider.dart
```dart
import 'package:flutter/foundation.dart'; // For ValueGetter
import 'package:flutter/material.dart';
import 'package:todo/models/todo.dart';
import 'package:todo/providers/auth_provider.dart';
import 'package:todo/services/supabase_service.dart';

class TodoProvider extends ChangeNotifier {
  final AuthProvider _authProvider;
  final SupabaseService _supabaseService = SupabaseService();
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
List<Todo> _todos = [];
bool _isLoading = false;
String? _error;

List<Todo> get todos => _todos;
bool get isLoading => _isLoading;
String? get error => _error;

TodoProvider(this._authProvider) {
  _authProvider.addListener(_onAuthChanged);
  _initializeTodos();
}

void _initializeTodos() {
  Future.microtask(() {
    if (_authProvider.isAuthenticated) {
      // print("TodoProvider: Initializing, user is authenticated. Fetching todos.");
      fetchTodos();
    } else {
      // print("TodoProvider: Initializing, user is not authenticated.");
    }
  });
}

void _onAuthChanged() {
  if (_authProvider.isAuthenticated) {
    // print("TodoProvider: Auth state changed, user is authenticated. Fetching
todos.");
    fetchTodos();
  } else {
    // print("TodoProvider: Auth state changed, user is signed out. Clearing
todos.");
    _todos = [];
    _error = null;
    _isLoading = false;
    notifyListeners();
  }
}

Future<void> fetchTodos() async {
  if (!_authProvider.isAuthenticated) {
    _todos = [];
    _setError(null);
    _setLoading(false);
    return;
  }
  _setLoading(true);
  _setError(null);
  try {
    _todos = await _supabaseService.getTodos();
  } catch (e) {
    _setError(e.toString());
    _todos = [];
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
      } finally {
        _setLoading(false);
      }
    }

    Future<bool> addTodo({required String title, String? description}) async {
      if (!_authProvider.isAuthenticated) {
        _setError("User not authenticated to add todo.");
        return false;
      }
      _setLoading(true);
      _setError(null);
      try {
        final newTodo = await _supabaseService.createTodo(
          title: title,
          description: description,
        );
        _todos.insert(0, newTodo);
        _setLoading(false);
        return true;
      } catch (e) {
        _setError(e.toString());
        _setLoading(false);
        return false;
      }
    }

    Future<bool> updateTodo({
      required String id,
      String? title,
      String? description,
      bool? isComplete,
    }) async {
      if (!_authProvider.isAuthenticated) {
        _setError("User not authenticated to update todo.");
        return false;
      }

      final index = _todos.indexWhere((todo) => todo.id == id);
      if (index == -1) {
        _setError("Todo not found for update.");
        return false;
      }

      Todo originalTodo = _todos[index];
      Todo updatedTodoForUI = originalTodo.copyWith(
        title: title, // Assuming 'title' in copyWith is: String? title
        // Correctly pass ValueGetter for description if its type in copyWith is
ValueGetter<String?>?
        description:
          description != null
              ? () =>
                  description // If new description is provided
                : (originalTodo.description != null
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
            ? () => null
            : null), // If new description is null, and old was not, set to null. Else,
no change (ValueGetter is null)

      isComplete:
          isComplete, // Assuming 'isComplete' in copyWith is: bool? isComplete
      // Correctly pass ValueGetter for updatedAt if its type in copyWith is
ValueGetter<DateTime?>?
      updatedAt: () => DateTime.now(),
    );
    _todos[index] = updatedTodoForUI;
    notifyListeners();

    _setError(null);
    try {
      await _supabaseService.updateTodo(
        id: id,
        title: title,
        description: description,
        isComplete: isComplete,
      );
      return true;
    } catch (e) {
      _todos[index] = originalTodo; // Revert optimistic update
      _setError(e.toString());
      notifyListeners();
      return false;
    }
  }

  Future<bool> deleteTodo(String id) async {
    if (!_authProvider.isAuthenticated) {
      _setError("User not authenticated to delete todo.");
      return false;
    }
    final index = _todos.indexWhere((todo) => todo.id == id);
    if (index == -1) {
      _setError("Todo not found for deletion.");
      return false;
    }
    Todo todoToRemove = _todos[index];
    _todos.removeAt(index);
    notifyListeners();

    _setError(null);
    try {
      await _supabaseService.deleteTodo(id);
      return true;
    } catch (e) {
      _todos.insert(index, todoToRemove); // Revert optimistic delete
      _setError(e.toString());
      notifyListeners();
      return false;
    }
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
  }

  Future<void> toggleTodoCompletion(Todo todo) async {
    await updateTodo(id: todo.id, isComplete: !todo.isComplete);
  }

  void _setLoading(bool value) {
    if (_isLoading == value) return;
    _isLoading = value;
    notifyListeners();
  }

  void _setError(String? value) {
    if (_error == value) return;
    _error = value;
    notifyListeners();
  }

  @override
  void dispose() {
    _authProvider.removeListener(_onAuthChanged);
    super.dispose();
  }
}
```

login_screen.dart
```
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/auth_provider.dart';
import 'package:todo/screens/auth/register_screen.dart';
import 'package:todo/screens/home_screen.dart';
import 'package:todo/widgets/auth/social_login_button.dart';

class LoginScreen extends StatefulWidget {
  const LoginScreen({Key? key}) : super(key: key);

  @override
  State<LoginScreen> createState() => _LoginScreenState();
}

class _LoginScreenState extends State<LoginScreen> {
  final _formKey = GlobalKey<FormState>();
  final _emailController = TextEditingController();
  final _passwordController = TextEditingController();
  bool _isPasswordVisible = false;

  @override
  void dispose() {
    _emailController.dispose();
    _passwordController.dispose();
    super.dispose();
  }

  Future<void> _login() async {
    if (!_formKey.currentState!.validate()) return;
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
    final authProvider = Provider.of<AuthProvider>(context, listen: false);
    final success = await authProvider.signIn(
      email: _emailController.text.trim(),
      password: _passwordController.text,
    );

    if (success && mounted) {
      Navigator.of(
        context,
      ).pushReplacement(MaterialPageRoute(builder: (_) => const
HomeScreen()));
    }
  }

  Future<void> _loginWithGoogle() async {
    final authProvider = Provider.of<AuthProvider>(context, listen: false);
    final success = await authProvider.signInWithGoogle();

    if (success && mounted) {
      Navigator.of(
        context,
      ).pushReplacement(MaterialPageRoute(builder: (_) => const
HomeScreen()));
    }
  }

  @override
  Widget build(BuildContext context) {
    final authProvider = Provider.of<AuthProvider>(context);

    return Scaffold(
      body: SafeArea(
        child: Center(
          child: SingleChildScrollView(
            padding: const EdgeInsets.all(24),
            child: Column(
              mainAxisAlignment: MainAxisAlignment.center,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Icon(
                  Icons.check_circle_outline,
                  size: 80,
                  color: Theme.of(context).primaryColor,
                ),
                const SizedBox(height: 24),
                const Text(
                  'Welcome Back',
                  style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
                  textAlign: TextAlign.center,
                ),
                const SizedBox(height: 8),
                const Text(
                  'Sign in to continue',
```
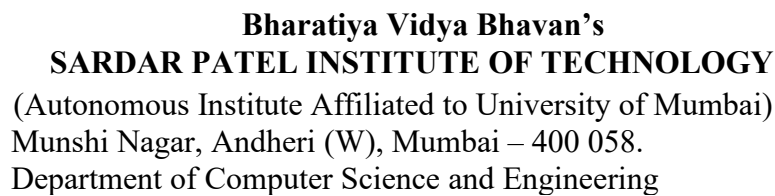
Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                            style: TextStyle(fontSize: 16, color: Colors.grey),
                            textAlign: TextAlign.center,
                          ),
                          const SizedBox(height: 32),
                          Form(
                            key: _formKey,
                            child: Column(
                              crossAxisAlignment: CrossAxisAlignment.stretch,
                              children: [
                                TextFormField(
                                  controller: _emailController,
                                  decoration: const InputDecoration(
                                    labelText: 'Email',
                                    prefixIcon: Icon(Icons.email_outlined),
                                    border: OutlineInputBorder(),
                                  ),
                                  keyboardType: TextInputType.emailAddress,
                                  validator: (value) {
                                    if (value == null || value.isEmpty) {
                                      return 'Please enter your email';
                                    }
                                    if (!value.contains('@')) {
                                      return 'Please enter a valid email';
                                    }
                                    return null;
                                  },
                                ),
                                const SizedBox(height: 16),
                                TextFormField(
                                  controller: _passwordController,
                                  decoration: InputDecoration(
                                    labelText: 'Password',
                                    prefixIcon: const Icon(Icons.lock_outline),
                                    border: const OutlineInputBorder(),
                                    suffixIcon: IconButton(
                                      icon: Icon(
                                        _isPasswordVisible
                                            ? Icons.visibility_off
                                            : Icons.visibility,
                                      ),
                                      onPressed: () {
                                        setState(() {
                                          _isPasswordVisible = !_isPasswordVisible;
                                        });
                                      },
                                    ),
                                  ),
                                  obscureText: !_isPasswordVisible,
                                  validator: (value) {
                                    if (value == null || value.isEmpty) {
                                      return 'Please enter your password';
                                    }
                                    if (value.length < 6) {
                                      return 'Password must be at least 6 characters';
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
                            }
                            return null;
                          },
                        ),
                        const SizedBox(height: 24),
                        ElevatedButton(
                          onPressed: authProvider.isLoading ? null : _login,
                          style: ElevatedButton.styleFrom(
                            padding: const EdgeInsets.symmetric(vertical: 16),
                            backgroundColor: Theme.of(context).primaryColor,
                            foregroundColor: Colors.white,
                          ),
                          child:
                              authProvider.isLoading
                                  ? const CircularProgressIndicator(
                                    color: Colors.white,
                                  )
                                  : const Text(
                                    'Sign In',
                                    style: TextStyle(fontSize: 16),
                                  ),
                        ),
                        if (authProvider.error != null) ...[
                          const SizedBox(height: 16),
                          Text(
                            authProvider.error!,
                            style: const TextStyle(
                              color: Colors.red,
                              fontSize: 14,
                            ),
                            textAlign: TextAlign.center,
                          ),
                        ],
                        const SizedBox(height: 24),
                        // const Row(
                        //   children: [
                        //     Expanded(child: Divider()),
                        //     Padding(
                        //       padding: EdgeInsets.symmetric(horizontal: 16),
                        //       child: Text('OR'),
                        //     ),
                        //     Expanded(child: Divider()),
                        //   ],
                        // ),
                        // const SizedBox(height: 24),
                        // SocialLoginButton(
                        //   icon: Icons.g_mobiledata,
                        //   text: 'Continue with Google',
                        //   onPressed: _loginWithGoogle,
                        //   isLoading: authProvider.isLoading,
                        // ),
                        const SizedBox(height: 24),
                        Row(
                          mainAxisAlignment: MainAxisAlignment.center,
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                                  children: [
                                    const Text("Don't have an account?"),
                                    TextButton(
                                      onPressed: () {
                                        Navigator.of(context).push(
                                          MaterialPageRoute(
                                            builder: (_) => const RegisterScreen(),
                                          ),
                                        );
                                      },
                                      child: const Text('Sign Up'),
                                    ),
                                  ],
                                ),
                              ],
                            ),
                          ),
                        ],
                      ),
                    ),
                  ),
                ),
              ),
            );
          }
        }
```

register_screen.dart
```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/auth_provider.dart';
import 'package:todo/screens/home_screen.dart';
import 'package:todo/widgets/auth/social_login_button.dart';

class RegisterScreen extends StatefulWidget {
  const RegisterScreen({Key? key}) : super(key: key);

  @override
  State<RegisterScreen> createState() => _RegisterScreenState();
}

class _RegisterScreenState extends State<RegisterScreen> {
  final _formKey = GlobalKey<FormState>();
  final _emailController = TextEditingController();
  final _passwordController = TextEditingController();
  final _confirmPasswordController = TextEditingController();
  bool _isPasswordVisible = false;
  bool _isConfirmPasswordVisible = false;

  @override
  void dispose() {
    _emailController.dispose();
    _passwordController.dispose();
    _confirmPasswordController.dispose();
    super.dispose();
  }
}
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
  Future<void> _register() async {
   if (!_formKey.currentState!.validate()) return;

   final authProvider = Provider.of<AuthProvider>(context, listen: false);
   final success = await authProvider.signUp(
    email: _emailController.text.trim(),
    password: _passwordController.text,
   );

   if (success && mounted) {
    Navigator.of(
      context,
    ).pushReplacement(MaterialPageRoute(builder: (_) => const
HomeScreen()));
   }
  }

  Future<void> _loginWithGoogle() async {
    final authProvider = Provider.of<AuthProvider>(context, listen: false);
    final success = await authProvider.signInWithGoogle();

    if (success && mounted) {
     Navigator.of(
       context,
     ).pushReplacement(MaterialPageRoute(builder: (_) => const
HomeScreen()));
    }
  }

  @override
  Widget build(BuildContext context) {
    final authProvider = Provider.of<AuthProvider>(context);

    return Scaffold(
     appBar: AppBar(title: const Text('Create Account')),
     body: SafeArea(
      child: Center(
       child: SingleChildScrollView(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          crossAxisAlignment: CrossAxisAlignment.stretch,
          children: [
           Icon(
             Icons.person_add_outlined,
             size: 80,
             color: Theme.of(context).primaryColor,
           ),
           const SizedBox(height: 24),
           const Text(
             'Create an Account',
             style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
             textAlign: TextAlign.center,
```
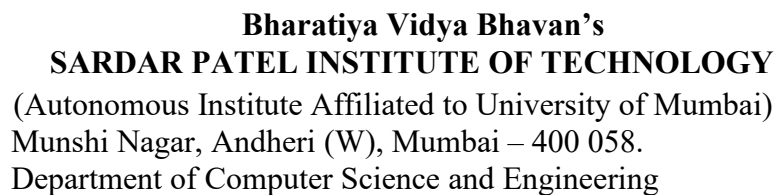
Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
            ),
            const SizedBox(height: 8),
            const Text(
              'Sign up to get started',
              style: TextStyle(fontSize: 16, color: Colors.grey),
              textAlign: TextAlign.center,
            ),
            const SizedBox(height: 32),
            Form(
              key: _formKey,
              child: Column(
                crossAxisAlignment: CrossAxisAlignment.stretch,
                children: [
                  TextFormField(
                    controller: _emailController,
                    decoration: const InputDecoration(
                      labelText: 'Email',
                      prefixIcon: Icon(Icons.email_outlined),
                      border: OutlineInputBorder(),
                    ),
                    keyboardType: TextInputType.emailAddress,
                    validator: (value) {
                      if (value == null || value.isEmpty) {
                        return 'Please enter your email';
                      }
                      if (!value.contains('@')) {
                        return 'Please enter a valid email';
                      }
                      return null;
                    },
                  ),
                  const SizedBox(height: 16),
                  TextFormField(
                    controller: _passwordController,
                    decoration: InputDecoration(
                      labelText: 'Password',
                      prefixIcon: const Icon(Icons.lock_outline),
                      border: const OutlineInputBorder(),
                      suffixIcon: IconButton(
                        icon: Icon(
                          _isPasswordVisible
                              ? Icons.visibility_off
                              : Icons.visibility,
                        ),
                        onPressed: () {
                          setState(() {
                            _isPasswordVisible = !_isPasswordVisible;
                          });
                        },
                      ),
                    ),
                    obscureText: !_isPasswordVisible,
                    validator: (value) {
                      if (value == null || value.isEmpty) {
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                            return 'Please enter your password';
                          }
                          if (value.length < 6) {
                            return 'Password must be at least 6 characters';
                          }
                          return null;
                        },
                      ),
                      const SizedBox(height: 16),
                      TextFormField(
                        controller: _confirmPasswordController,
                        decoration: InputDecoration(
                          labelText: 'Confirm Password',
                          prefixIcon: const Icon(Icons.lock_outline),
                          border: const OutlineInputBorder(),
                          suffixIcon: IconButton(
                            icon: Icon(
                              _isConfirmPasswordVisible
                                  ? Icons.visibility_off
                                  : Icons.visibility,
                            ),
                            onPressed: () {
                              setState(() {
                                _isConfirmPasswordVisible =
                                    !_isConfirmPasswordVisible;
                              });
                            },
                          ),
                        ),
                        obscureText: !_isConfirmPasswordVisible,
                        validator: (value) {
                          if (value == null || value.isEmpty) {
                            return 'Please confirm your password';
                          }
                          if (value != _passwordController.text) {
                            return 'Passwords do not match';
                          }
                          return null;
                        },
                      ),
                      const SizedBox(height: 24),
                      ElevatedButton(
                        onPressed: authProvider.isLoading ? null : _register,
                        style: ElevatedButton.styleFrom(
                          padding: const EdgeInsets.symmetric(vertical: 16),
                          backgroundColor: Theme.of(context).primaryColor,
                          foregroundColor: Colors.white,
                        ),
                        child:
                            authProvider.isLoading
                                ? const CircularProgressIndicator(
                                  color: Colors.white,
                                )
                                : const Text(
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
                    'Sign Up',
                    style: TextStyle(fontSize: 16),
                  ),
                ),
                if (authProvider.error != null) ...[
                  const SizedBox(height: 16),
                  Text(
                    authProvider.error!,
                    style: const TextStyle(
                      color: Colors.red,
                      fontSize: 14,
                    ),
                    textAlign: TextAlign.center,
                  ),
                ],
                // const SizedBox(height: 24),
                // const Row(
                //   children: [
                //     Expanded(child: Divider()),
                //     Padding(
                //       padding: EdgeInsets.symmetric(horizontal: 16),
                //       child: Text('OR'),
                //     ),
                //     Expanded(child: Divider()),
                //   ],
                // ),
                // const SizedBox(height: 24),
                // SocialLoginButton(
                //   icon: Icons.g_mobiledata,
                //   text: 'Continue with Google',
                //   onPressed: _loginWithGoogle,
                //   isLoading: authProvider.isLoading,
                // ),
                const SizedBox(height: 24),
                Row(
                  mainAxisAlignment: MainAxisAlignment.center,
                  children: [
                    const Text("Already have an account?"),
                    TextButton(
                      onPressed: () {
                        Navigator.of(context).pop();
                      },
                      child: const Text('Sign In'),
                    ),
                  ],
                ),
              ],
            ),
          ),
        ),
      ),
    ),
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
    );
  }
}
```

home_screen.dart
```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/auth_provider.dart';
import 'package:todo/providers/todo_provider.dart';
import 'package:todo/screens/auth/login_screen.dart'; // Ensure this path is
correct
import 'package:todo/screens/profile_screen.dart';
import 'package:todo/widgets/todo/add_todo_dialog.dart';
import 'package:todo/widgets/todo/todo_list.dart'; // Ensure this path is correct

class HomeScreen extends StatefulWidget {
  const HomeScreen({Key? key}) : super(key: key);

  @override
  State<HomeScreen> createState() => _HomeScreenState();
}

class _HomeScreenState extends State<HomeScreen> {
  @override
  void initState() {
    super.initState();
    // TodoProvider now handles its initial load based on AuthProvider's state.
    // So, this explicit call might be redundant if _initializeTodos in TodoProvider
works as expected.
    // However, calling it here ensures that if the HomeScreen is built while the
user
    // is already authenticated, todos are fetched promptly.
    // Let's keep it for robustness, TodoProvider's loading guards should prevent
issues.
    _fetchTodosOnLoad();
  }

  Future<void> _fetchTodosOnLoad() async {
    // Ensure the context is available and listen:false for one-off actions
    // Wait for the first frame to ensure providers are ready
    WidgetsBinding.instance.addPostFrameCallback((_) {
      if (mounted) {
        // Check if the widget is still in the tree
        Provider.of<TodoProvider>(context, listen: false).fetchTodos();
      }
    });
  }

  Future<void> _signOut() async {
    await Provider.of<AuthProvider>(context, listen: false).signOut();
    if (!mounted) return;

    // Navigate to LoginScreen after sign out
    Navigator.of(context).pushAndRemoveUntil(
      MaterialPageRoute(builder: (_) => const LoginScreen()),
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
        (route) => false, // Remove all previous routes
      );
    }

    void _showAddTodoDialog() {
      showDialog(
        context: context,
        builder: (BuildContext dialogContext) {
          // It's good practice to use the dialog's context for providers if needed within
the dialog
          return const AddTodoDialog();
        },
      );
    }

    @override
    Widget build(BuildContext context) {
     // Listen to AuthProvider to rebuild when auth state (and profile) changes
     final authProvider = Provider.of<AuthProvider>(context);
     // Listen to TodoProvider to rebuild when todos, loading, or error state changes
     final todoProvider = Provider.of<TodoProvider>(context);
     final profile = authProvider.profile;

     return Scaffold(
      appBar: AppBar(
       title: Text(profile?.username ?? 'Todo App'),
       actions: [
        IconButton(
         icon: const Icon(Icons.person_outline),
         onPressed: () {
          Navigator.of(
            context,
          ).push(MaterialPageRoute(builder: (_) => const ProfileScreen()));
         },
        ),
        IconButton(
         icon: const Icon(Icons.logout_outlined),
         onPressed: _signOut,
        ),
       ],
      ),
      body: Column(
       children: [
        // if (profile != null)
        //   Padding(
        //     padding: const EdgeInsets.all(16.0),
        //     child: Row(
        //       children: [
        //         CircleAvatar(
        //           radius: 24,
        //           backgroundColor:
        //             Theme.of(context).colorScheme.primaryContainer,
        //           child: Text(
        //             profile.username?.isNotEmpty == true
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
//                    ? profile.username!.substring(0, 1).toUpperCase()
//                    : profile.email.substring(0, 1).toUpperCase(),
//                  style: TextStyle(
//                    color: Theme.of(context).colorScheme.onPrimaryContainer,
//                    fontWeight: FontWeight.bold,
//                    fontSize: 18,
//                  ),
//                ),
//              ),
//              const SizedBox(width: 16),
//              Expanded(
//                // Use Expanded to prevent overflow if text is long
//                child: Column(
//                  crossAxisAlignment: CrossAxisAlignment.start,
//                  children: [
//                    Text(
//                      profile.username ?? 'User',
//                      style: Theme.of(context).textTheme.titleMedium
//                          ?.copyWith(fontWeight: FontWeight.bold),
//                      overflow: TextOverflow.ellipsis,
//                    ),
//                    Text(
//                      profile.email,
//                      style: Theme.of(context).textTheme.bodySmall,
//                      overflow: TextOverflow.ellipsis,
//                    ),
//                  ],
//                ),
//              ),
//            ],
//          ),
//        ),
        Expanded(
          child:
              todoProvider.isLoading && todoProvider.todos.isEmpty
                  ? const Center(child: CircularProgressIndicator())
                  : todoProvider.error != null && todoProvider.todos.isEmpty
                  ? Center(
                    child: Padding(
                      padding: const EdgeInsets.all(16.0),
                      child: Text(
                        'Error: ${todoProvider.error}\nPull to refresh.',
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          color: Theme.of(context).colorScheme.error,
                        ),
                      ),
                    ),
                  )
                  : todoProvider.todos.isEmpty
                  ? Center(
                    child: Column(
                      mainAxisAlignment: MainAxisAlignment.center,
                      children: [
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
                          Icon(
                            Icons.check_circle_outline,
                            size: 80,
                            color: Colors.grey[400],
                          ),
                          const SizedBox(height: 16),
                          Text(
                            'No todos yet!',
                            style: Theme.of(context).textTheme.headlineSmall
                                ?.copyWith(color: Colors.grey[600]),
                          ),
                          const SizedBox(height: 8),
                          Text(
                            'Tap the "+" button to add your first todo.',
                            style: Theme.of(context).textTheme.bodyMedium
                                ?.copyWith(color: Colors.grey[600]),
                          ),
                        ],
                      ),
                    )
                  : RefreshIndicator(
                    onRefresh:
                        () =>
                            todoProvider
                                .fetchTodos(), // Use the provider's method
                    child:
                        const TodoList(), // Ensure TodoList uses
Provider.of<TodoProvider>(context)
                    ),
            ),
            // Display error at the bottom if todos are already loaded but an error
occurs later
            if (todoProvider.error != null && todoProvider.todos.isNotEmpty)
              Container(
                padding: const EdgeInsets.all(16.0),
                color: Theme.of(context).colorScheme.errorContainer,
                width: double.infinity,
                child: Text(
                  todoProvider.error!,
                  textAlign: TextAlign.center,
                  style: TextStyle(
                    color: Theme.of(context).colorScheme.onErrorContainer,
                  ),
                ),
              ),
          ],
        ),
      ),
      floatingActionButton: FloatingActionButton(
        onPressed: _showAddTodoDialog,
        tooltip: 'Add Todo',
        child: const Icon(Icons.add),
      ),
    );
  }
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
}
```

profile_screen.dart

```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/auth_provider.dart';

class ProfileScreen extends StatefulWidget {
  const ProfileScreen({Key? key}) : super(key: key);

  @override
  State<ProfileScreen> createState() => _ProfileScreenState();
}

class _ProfileScreenState extends State<ProfileScreen> {
  final _formKey = GlobalKey<FormState>();
  late TextEditingController _usernameController;

  @override
  void initState() {
    super.initState();
    final profile = Provider.of<AuthProvider>(context, listen: false).profile;
    _usernameController = TextEditingController(text: profile?.username);
  }

  @override
  void dispose() {
    _usernameController.dispose();
    super.dispose();
  }

  Future<void> _updateProfile() async {
    if (!_formKey.currentState!.validate()) return;

    final authProvider = Provider.of<AuthProvider>(context, listen: false);
    await authProvider.updateProfile(username: _usernameController.text.trim());

    if (!mounted) return;
    ScaffoldMessenger.of(context).showSnackBar(
      const SnackBar(content: Text('Profile updated successfully')),
    );
  }

  @override
  Widget build(BuildContext context) {
    final authProvider = Provider.of<AuthProvider>(context);
    final profile = authProvider.profile;

    if (profile == null) {
      return const Scaffold(body: Center(child: CircularProgressIndicator()));
    }

    return Scaffold(
      appBar: AppBar(title: const Text('Profile')),
      body: SingleChildScrollView(
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
        padding: const EdgeInsets.all(16),
      child: Column(
        crossAxisAlignment: CrossAxisAlignment.center,
        children: [
          const SizedBox(height: 16),
          CircleAvatar(
            radius: 50,
            backgroundColor: Theme.of(context).primaryColor,
            child: Text(
              profile.username?.substring(0, 1).toUpperCase() ??
                profile.email.substring(0, 1).toUpperCase(),
              style: const TextStyle(
                color: Colors.white,
                fontWeight: FontWeight.bold,
                fontSize: 36,
              ),
            ),
          ),
          const SizedBox(height: 24),
          Text(
            profile.email,
            style: const TextStyle(fontSize: 18, fontWeight: FontWeight.bold),
          ),
          const SizedBox(height: 32),
          Card(
            elevation: 2,
            child: Padding(
              padding: const EdgeInsets.all(16),
              child: Form(
                key: _formKey,
                child: Column(
                  crossAxisAlignment: CrossAxisAlignment.stretch,
                  children: [
                    const Text(
                      'Edit Profile',
                      style: TextStyle(
                        fontSize: 20,
                        fontWeight: FontWeight.bold,
                      ),
                    ),
                    const SizedBox(height: 16),
                    TextFormField(
                      controller: _usernameController,
                      decoration: const InputDecoration(
                        labelText: 'Username',
                        border: OutlineInputBorder(),
                      ),
                      validator: (value) {
                      if (value == null || value.isEmpty) {
                        return 'Please enter a username';
                      }
                      return null;
                    },
                    ),
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                    const SizedBox(height: 24),
                    ElevatedButton(
                      onPressed:
                        authProvider.isLoading ? null : _updateProfile,
                      style: ElevatedButton.styleFrom(
                        padding: const EdgeInsets.symmetric(vertical: 16),
                      ),
                      child:
                        authProvider.isLoading
                            ? const CircularProgressIndicator()
                            : const Text('Update Profile'),
                    ),
                    if (authProvider.error != null) ...[
                      const SizedBox(height: 16),
                      Text(
                        authProvider.error!,
                        style: const TextStyle(color: Colors.red),
                      ),
                    ],
                  ],
                ),
              ),
            ),
          ),
        ],
      ),
    ),
  );
 }
}
```

splash_screen.dart
```
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/auth_provider.dart';
import 'package:todo/screens/auth/login_screen.dart';
import 'package:todo/screens/home_screen.dart';

class SplashScreen extends StatefulWidget {
 const SplashScreen({Key? key}) : super(key: key);

 @override
 State<SplashScreen> createState() => _SplashScreenState();
}

class _SplashScreenState extends State<SplashScreen> {
 @override
 void initState() {
  super.initState();
  _checkAuth();
 }

 Future<void> _checkAuth() async {
  await Future.delayed(const Duration(seconds: 2));
  if (!mounted) return;
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
    final authProvider = Provider.of<AuthProvider>(context, listen: false);

    if (authProvider.isAuthenticated) {
      Navigator.of(
        context,
      ).pushReplacement(MaterialPageRoute(builder: (_) => const
HomeScreen()));
    } else {
      Navigator.of(
        context,
      ).pushReplacement(MaterialPageRoute(builder: (_) => const
LoginScreen()));
    }
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [
            Icon(
              Icons.check_circle_outline,
              size: 100,
              color: Theme.of(context).primaryColor,
            ),
            const SizedBox(height: 24),
            const Text(
              'Todo App',
              style: TextStyle(fontSize: 32, fontWeight: FontWeight.bold),
            ),
            const SizedBox(height: 24),
            const CircularProgressIndicator(),
          ],
        ),
      ),
    );
  }
}
```

superbase_service.dart

```dart
import 'package:supabase_flutter/supabase_flutter.dart';
import 'package:todo/models/profile.dart';
import 'package:todo/models/todo.dart';

class SupabaseService {
  final SupabaseClient _supabaseClient = Supabase.instance.client;

  // Authentication methods
  Future<AuthResponse> signUp({
    required String email,
    required String password,
  }) async {
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
    return await _supabaseClient.auth.signUp(email: email, password: password);
  }

  Future<AuthResponse> signIn({
    required String email,
    required String password,
  }) async {
    return await _supabaseClient.auth.signInWithPassword(
      email: email,
      password: password,
    );
  }

  Future<bool> signInWithGoogle() async {
    return await _supabaseClient.auth.signInWithOAuth(
      Provider.google, // Use the correct enum from supabase_flutter
      redirectTo: 'io.supabase.fluttertodo://login-callback/',
    );
  }

  Future<void> signOut() async {
    await _supabaseClient.auth.signOut();
  }

  User? get currentUser => _supabaseClient.auth.currentUser;

  // Profile methods
  Future<Profile?> getProfile() async {
    final user = _supabaseClient.auth.currentUser;
    if (user == null) {
      print("SupabaseService.getProfile: No current user.");
      return null;
    }
    try {
      final response =
          await _supabaseClient
              .from('profiles')
              .select()
              .eq('id', user.id)
              .single();
      return Profile.fromJson(response);
    } on PostgrestException catch (e) {
      if (e.code == 'PGRST116') {
        // Profile not found
        print(
          "SupabaseService.getProfile: No profile found for user ${user.id}
(PGRST116). This is expected if it's a new user.",
        );
        return null;
      }
      print(
        "SupabaseService.getProfile: PostgrestException for user ${user.id}:
${e.message} (Code: ${e.code})",
      );
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
      // Rethrow other errors so AuthProvider can catch them
      rethrow;
    } catch (e) {
     print(
       "SupabaseService.getProfile: Unexpected error for user ${user.id}: $e",
     );
     rethrow;
    }
  }

  Future<void> createProfile({
    required String email,
    String? username,
    String? avatarUrl,
  }) async {
    final user = _supabaseClient.auth.currentUser;
    if (user == null)
      throw Exception('User not authenticated for createProfile');

    try {
     await _supabaseClient.from('profiles').insert({
       'id': user.id, // This MUST match auth.users.id
       'email': email,
       'username': username,
       'avatar_url': avatarUrl,
       // 'updated_at': DateTime.now().toIso8601String(), // Supabase handles this
     });
     print(
       "SupabaseService.createProfile: Profile insert attempted for user ${user.id}.
CHECK RLS IF IT FAILS SILENTLY.",
     );
    } catch (e) {
     print(
       "SupabaseService.createProfile: ERROR inserting profile for user
${user.id}: $e. THIS IS A CRITICAL ERROR.",
     );
     // This error needs to be propagated so AuthProvider knows profile creation
failed.
     rethrow;
    }
  }

  Future<void> updateProfile({String? username, String? avatarUrl}) async {
    final user = _supabaseClient.auth.currentUser;
    if (user == null)
     throw Exception('User not authenticated for updateProfile');

    final updates = <String, dynamic>{
     'updated_at': DateTime.now().toIso8601String(),
    };
    if (username != null) updates['username'] = username;
    if (avatarUrl != null) updates['avatar_url'] = avatarUrl;

    if (updates.length > 1) {
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
    await _supabaseClient.from('profiles').update(updates).eq('id', user.id);
  }
}

// Todo methods
Future<List<Todo>> getTodos() async {
  final user = _supabaseClient.auth.currentUser;
  if (user == null) {
    print(
      "SupabaseService.getTodos: User not authenticated. Returning empty list.",
    );
    return [];
  }
  final response = await _supabaseClient
      .from('todos')
      .select()
      .eq('user_id', user.id)
      .order('created_at', ascending: false);
  return (response as List).map((todo) => Todo.fromJson(todo)).toList();
}

Future<Todo> createTodo({required String title, String? description}) async {
  final user = _supabaseClient.auth.currentUser;
  if (user == null) throw Exception('User not authenticated for createTodo');

  // CRITICAL CHECK: Ensure a profile exists before creating a todo
  // This is a safeguard, primary logic is in AuthProvider
  final profileExists =
      await _supabaseClient
          .from('profiles')
          .select('id')
          .eq('id', user.id)
          .maybeSingle();
  if (profileExists == null) {
    print(
      "SupabaseService.createTodo: CRITICAL - Attempting to create todo for user ${user.id} but profile does NOT exist in 'profiles' table. This will cause a foreign key violation.",
    );
    throw Exception(
      "Profile for user ${user.id} not found. Cannot create todo. Please ensure RLS on 'profiles' allows insert, or sign out and sign in again.",
    );
  }

  final response =
      await _supabaseClient
          .from('todos')
          .insert({
            'user_id': user.id, // This user_id must exist in profiles.id
            'title': title,
            'description': description,
            'is_complete': false,
          })
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
              .select()
              .single();
      return Todo.fromJson(response);
  }

  Future<void> updateTodo({
    required String id,
    String? title,
    String? description,
    bool? isComplete,
  }) async {
    final user = _supabaseClient.auth.currentUser;
    if (user == null) throw Exception('User not authenticated for updateTodo');

    final updates = <String, dynamic>{
      'updated_at': DateTime.now().toIso8601String(),
    };
    if (title != null) updates['title'] = title;
    if (description != null) updates['description'] = description;
    if (isComplete != null) updates['is_complete'] = isComplete;

    if (updates.length > 1) {
      await _supabaseClient
          .from('todos')
          .update(updates)
          .eq('id', id)
          .eq('user_id', user.id);
    }
  }

  Future<void> deleteTodo(String id) async {
    final user = _supabaseClient.auth.currentUser;
    if (user == null) throw Exception('User not authenticated for deleteTodo');
    await _supabaseClient
        .from('todos')
        .delete()
        .eq('id', id)
        .eq('user_id', user.id);
  }

  Stream<AuthState> get authStateChanges =>
      _supabaseClient.auth.onAuthStateChange;
}
```

social_login_button.dart

```dart
import 'package:flutter/material.dart';

class SocialLoginButton extends StatelessWidget {
  final IconData icon;
  final String text;
  final VoidCallback onPressed;
  final bool isLoading;

  const SocialLoginButton({
    Key? key,
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
    required this.icon,
    required this.text,
    required this.onPressed,
    this.isLoading = false,
  }) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return OutlinedButton(
      onPressed: isLoading ? null : onPressed,
      style: OutlinedButton.styleFrom(
        padding: const EdgeInsets.symmetric(vertical: 16),
        side: BorderSide(color: Colors.grey[300]!),
      ),
      child: Row(
        mainAxisAlignment: MainAxisAlignment.center,
        children: [
          Icon(icon, size: 24),
          const SizedBox(width: 12),
          Text(text),
        ],
      ),
    );
  }
}
```

add_todo_dialog.dart

```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/todo_provider.dart';

class AddTodoDialog extends StatefulWidget {
  const AddTodoDialog({Key? key}) : super(key: key);

  @override
  State<AddTodoDialog> createState() => _AddTodoDialogState();
}

class _AddTodoDialogState extends State<AddTodoDialog> {
  final _formKey = GlobalKey<FormState>();
  final _titleController = TextEditingController();
  final _descriptionController = TextEditingController();

  @override
  void dispose() {
    _titleController.dispose();
    _descriptionController.dispose();
    super.dispose();
  }

  Future<void> _addTodo() async {
    if (!_formKey.currentState!.validate()) return;

    final todoProvider = Provider.of<TodoProvider>(context, listen: false);
    await todoProvider.addTodo(
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
        title: _titleController.text.trim(),
        description: _descriptionController.text.trim(),
      );

      if (!mounted) return;
      Navigator.of(context).pop();
    }

    @override
    Widget build(BuildContext context) {
      final todoProvider = Provider.of<TodoProvider>(context);

      return AlertDialog(
        title: const Text('Add Todo'),
        content: Form(
          key: _formKey,
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: [
              TextFormField(
                controller: _titleController,
                decoration: const InputDecoration(
                  labelText: 'Title',
                  border: OutlineInputBorder(),
                ),
                validator: (value) {
                  if (value == null || value.isEmpty) {
                    return 'Please enter a title';
                  }
                  return null;
                },
              ),
              const SizedBox(height: 16),
              TextFormField(
                controller: _descriptionController,
                decoration: const InputDecoration(
                  labelText: 'Description (optional)',
                  border: OutlineInputBorder(),
                ),
                maxLines: 3,
              ),
              if (todoProvider.error != null) ...[
                const SizedBox(height: 16),
                Text(
                  todoProvider.error!,
                  style: const TextStyle(color: Colors.red),
                ),
              ],
            ],
          ),
        ),
        actions: [
          TextButton(
            onPressed: () => Navigator.of(context).pop(),
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
              child: const Text('Cancel'),
            ),
            ElevatedButton(
              onPressed: todoProvider.isLoading ? null : _addTodo,
              child:
                  todoProvider.isLoading
                      ? const SizedBox(
                        width: 20,
                        height: 20,
                        child: CircularProgressIndicator(strokeWidth: 2),
                      )
                      : const Text('Add'),
            ),
          ],
        );
      }
}
```

edit_todo_dialog.dart

```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/models/todo.dart';
import 'package:todo/providers/todo_provider.dart';

class EditTodoDialog extends StatefulWidget {
  final Todo todo;

  const EditTodoDialog({Key? key, required this.todo}) : super(key: key);

  @override
  State<EditTodoDialog> createState() => _EditTodoDialogState();
}

class _EditTodoDialogState extends State<EditTodoDialog> {
  final _formKey = GlobalKey<FormState>();
  late TextEditingController _titleController;
  late TextEditingController _descriptionController;
  late bool _isComplete;

  @override
  void initState() {
    super.initState();
    _titleController = TextEditingController(text: widget.todo.title);
    _descriptionController = TextEditingController(
      text: widget.todo.description,
    );
    _isComplete = widget.todo.isComplete;
  }

  @override
  void dispose() {
    _titleController.dispose();
    _descriptionController.dispose();
    super.dispose();
  }
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
Future<void> _updateTodo() async {
 if (!_formKey.currentState!.validate()) return;

 final todoProvider = Provider.of<TodoProvider>(context, listen: false);
 await todoProvider.updateTodo(
  id: widget.todo.id,
  title: _titleController.text.trim(),
  description: _descriptionController.text.trim(),
  isComplete: _isComplete,
 );

 if (!mounted) return;
 Navigator.of(context).pop();
}

@override
Widget build(BuildContext context) {
 final todoProvider = Provider.of<TodoProvider>(context);

 return AlertDialog(
  title: const Text('Edit Todo'),
  content: Form(
   key: _formKey,
   child: Column(
    mainAxisSize: MainAxisSize.min,
    children: [
     TextFormField(
      controller: _titleController,
      decoration: const InputDecoration(
       labelText: 'Title',
       border: OutlineInputBorder(),
      ),
      validator: (value) {
       if (value == null || value.isEmpty) {
        return 'Please enter a title';
       }
       return null;
      },
     ),
     const SizedBox(height: 16),
     TextFormField(
      controller: _descriptionController,
      decoration: const InputDecoration(
       labelText: 'Description (optional)',
       border: OutlineInputBorder(),
      ),
      maxLines: 3,
     ),
     const SizedBox(height: 16),
     Row(
      children: [
       Checkbox(
        value: _isComplete,
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
                onChanged: (value) {
                  setState(() {
                    _isComplete = value ?? false;
                  });
                },
              ),
              const Text('Mark as completed'),
            ],
          ),
          if (todoProvider.error != null) ...[
            const SizedBox(height: 16),
            Text(
              todoProvider.error!,
              style: const TextStyle(color: Colors.red),
            ),
          ],
        ],
      ),
    ),
    actions: [
      TextButton(
        onPressed: () => Navigator.of(context).pop(),
        child: const Text('Cancel'),
      ),
      ElevatedButton(
        onPressed: todoProvider.isLoading ? null : _updateTodo,
        child:
            todoProvider.isLoading
                ? const SizedBox(
                  width: 20,
                  height: 20,
                  child: CircularProgressIndicator(strokeWidth: 2),
                )
                : const Text('Update'),
      ),
    ],
  );
 }
}
```

todo_item.dart
```dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/models/todo.dart';
import 'package:todo/providers/todo_provider.dart';
import 'package:todo/widgets/todo/edit_todo_dialog.dart';

class TodoItem extends StatelessWidget {
  final Todo todo;

  const TodoItem({Key? key, required this.todo}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    final todoProvider = Provider.of<TodoProvider>(context);
```

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```dart
return Dismissible(
  key: Key(todo.id),
  background: Container(
    color: Colors.red,
    alignment: Alignment.centerRight,
    padding: const EdgeInsets.only(right: 16),
    child: const Icon(Icons.delete, color: Colors.white),
  ),
  direction: DismissDirection.endToStart,
  confirmDismiss: (direction) async {
    return await showDialog(
      context: context,
      builder:
          (context) => AlertDialog(
            title: const Text('Delete Todo'),
            content: const Text(
              'Are you sure you want to delete this todo?',
            ),
            actions: [
              TextButton(
                onPressed: () => Navigator.of(context).pop(false),
                child: const Text('Cancel'),
              ),
              TextButton(
                onPressed: () => Navigator.of(context).pop(true),
                child: const Text('Delete'),
              ),
            ],
          ),
    );
  },
  onDismissed: (direction) {
    todoProvider.deleteTodo(todo.id);
    ScaffoldMessenger.of(
      context,
    ).showSnackBar(const SnackBar(content: Text('Todo deleted')));
  },
  child: Card(
    margin: const EdgeInsets.symmetric(horizontal: 16, vertical: 8),
    child: ListTile(
      contentPadding: const EdgeInsets.all(16),
      leading: Checkbox(
        value: todo.isComplete,
        onChanged: (value) {
          todoProvider.toggleTodoCompletion(todo);
        },
      ),
      title: Text(
        todo.title,
        style: TextStyle(
          fontSize: 18,
          fontWeight: FontWeight.bold,
          decoration: todo.isComplete ? TextDecoration.lineThrough : null,
```
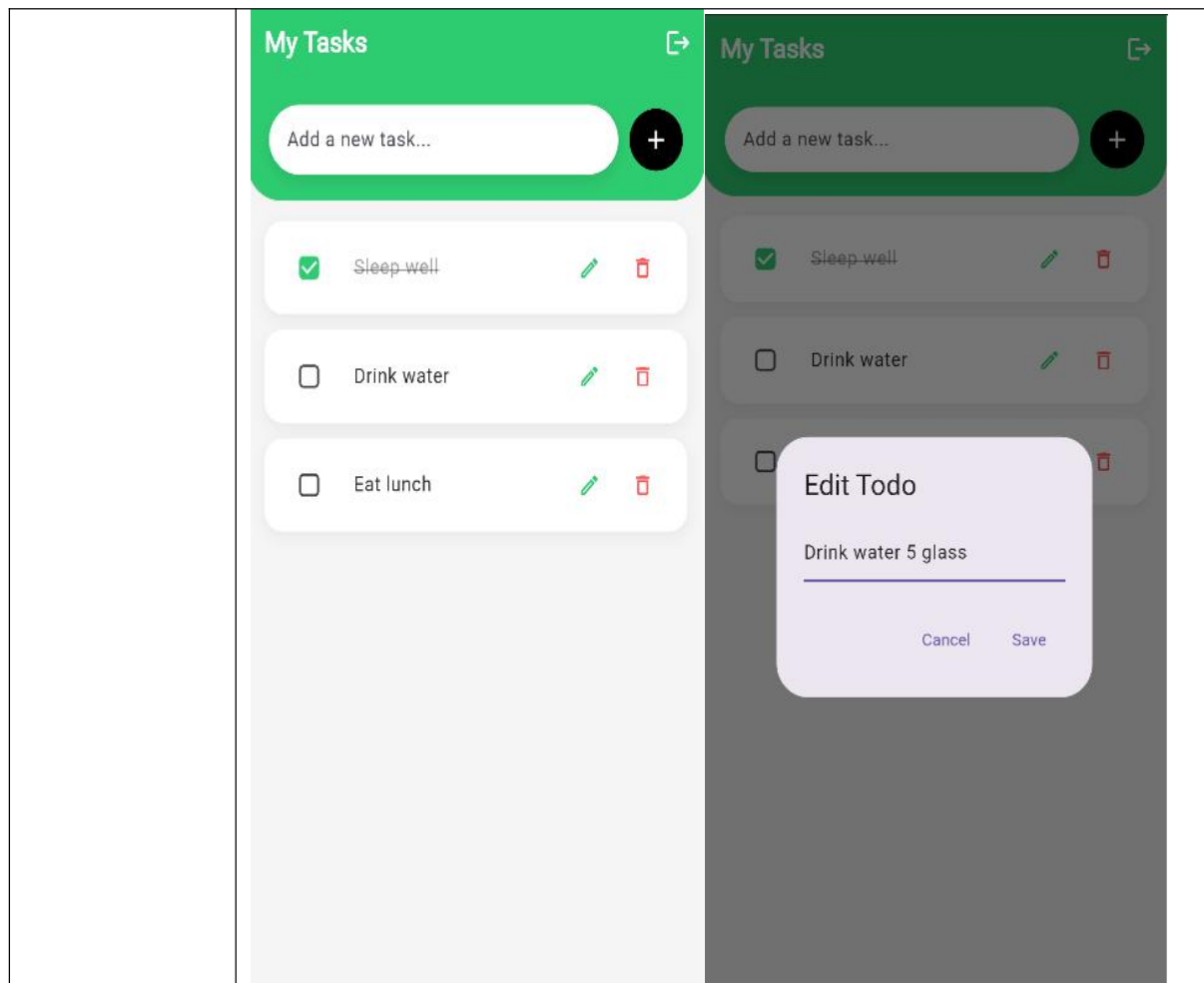
Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

```
          ),
        ),
      subtitle:
        todo.description != null && todo.description!.isNotEmpty
          ? Padding(
            padding: const EdgeInsets.only(top: 8),
            child: Text(
              todo.description!,
              style: TextStyle(
                decoration:
                  todo.isComplete ? TextDecoration.lineThrough : null,
              ),
            ),
          )
          : null,
      trailing: IconButton(
        icon: const Icon(Icons.edit),
        onPressed: () {
          showDialog(
            context: context,
            builder: (context) => EditTodoDialog(todo: todo),
          );
        },
      ),
    ),
  ),
  );
  }
}
```

todo_list.dart
```
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:todo/providers/todo_provider.dart';
import 'package:todo/widgets/todo/todo_item.dart';

class TodoList extends StatelessWidget {
  const TodoList({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    final todoProvider = Provider.of<TodoProvider>(context);
    final todos = todoProvider.todos;

    return ListView.builder(
      padding: const EdgeInsets.only(top: 8, bottom: 80),
      itemCount: todos.length,
      itemBuilder: (context, index) {
        final todo = todos[index];
        return TodoItem(todo: todo);
      },
    );
  }
}
```
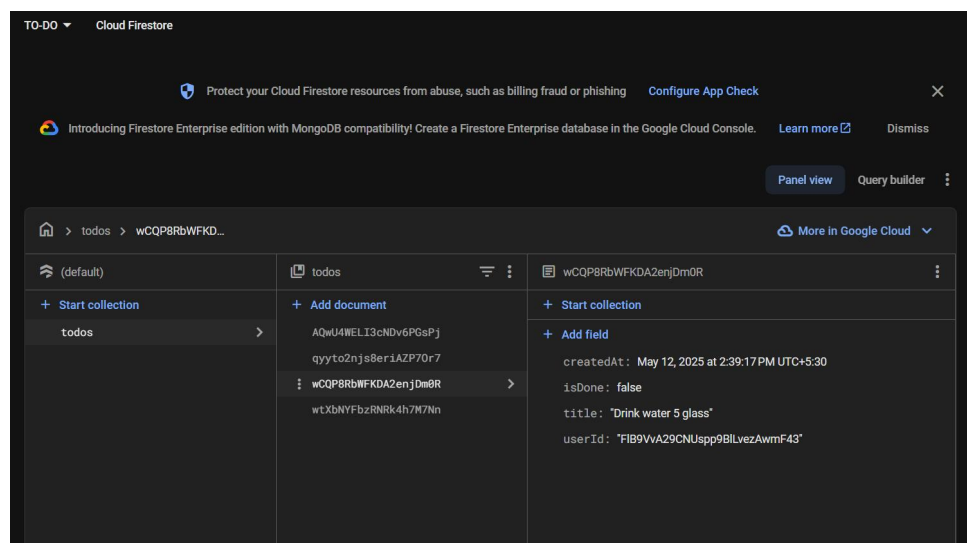
Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

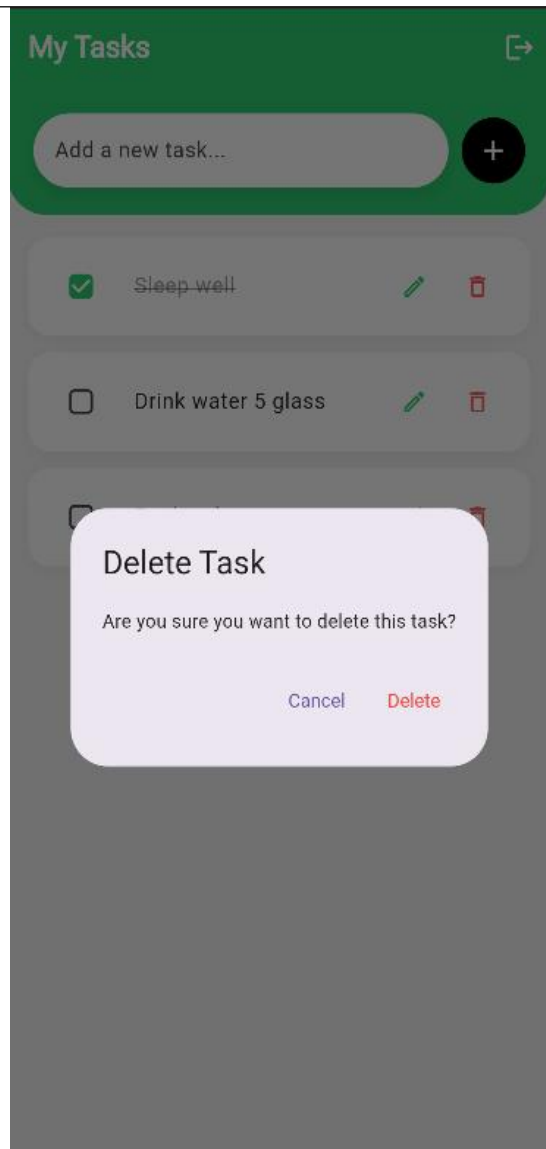|	
Screenshots	

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

My Tasks

Add a new task...

+

No tasks yet!

Add your first task above

My Tasks

Sleep well

+

Drink water

Eat lunch

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

Bharatiya Vidya Bhavan's
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Andheri (W), Mumbai – 400 058.
Department of Computer Science and Engineering

Question and Answers	Answer the following Questions:
	1. Write the connection steps, step-by-step for database connectivity. Ans: 1. to create instance of superbase client 2. Passing environment vairiables for securely connection to database 3. First one will be superbase url and second one will me ANON key which is auth token 4. Using superbase sdk to communicate with postgress db.
Conclusion	Learned how to connect to database