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| **Experiment** | 5 |
| **Aim** | Create an app for MCA department using side and tabs navigation |
| **Objective** | * To Create MCA App using UI Component * To Develop SideDrawer and Tabs Navigation in one application * To Use 60-30-10 rule * To Use Webview concept * To Use Expandable Card View Concept |
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| **Technology used** | **Flutter, Dart** |
| **Task** | Create an app for MCA department using side and tabs navigation consisting of the following:  1)    Faculty information with Expandable Card view  2)    Department Vision and Mission with expandable Card view  3)    Notification of any upcoming event (links to the website).  4)    WebView  5)    Feedback form along with rating |
| **Code with proper label** | Drawer\_menu.dart  import 'package:flutter/material.dart'; import '../screens/webview\_screen.dart';  class DrawerMenu extends StatelessWidget {  @override  Widget build(BuildContext context) {  return Drawer(  child: Column(  children: [  SizedBox(height: MediaQuery.*of*(context).padding.top), // Adjust for status bar  Container(  width: double.*infinity*,  padding: EdgeInsets.all(20),  decoration: BoxDecoration(  color: Colors.*brown*,  borderRadius: BorderRadius.only(bottomLeft: Radius.circular(20), bottomRight: Radius.circular(20)),  ),  child: Column(  mainAxisAlignment: MainAxisAlignment.center,  children: [  CircleAvatar(  radius: 40,  backgroundImage: AssetImage('assets/spit.png'),  ),  SizedBox(height: 10),  Text(  'S.P.I.T MCA Dept.',  style: TextStyle(color: Colors.*white*, fontSize: 24, fontWeight: FontWeight.*bold*),  ),  ],  ),  ),  Expanded(  child: ListView(  padding: EdgeInsets.*zero*,  children: [  ListTile(  leading: Icon(Icons.*web*, color: Colors.*brown*.shade800),  title: Text("College Website", style: TextStyle(fontSize: 16, fontWeight: FontWeight.*bold*)),  onTap: () => Navigator.*push*(  context, MaterialPageRoute(builder: (\_) => WebViewScreen())),  ),  Divider(),  ListTile(  leading: Icon(Icons.*info*, color: Colors.*brown*.shade800),  title: Text("About MCA", style: TextStyle(fontSize: 16, fontWeight: FontWeight.*bold*)),   ),  ListTile(  leading: Icon(Icons.*event*, color: Colors.*brown*.shade800),  title: Text("Events" , style: TextStyle(fontSize: 16, fontWeight: FontWeight.*bold*)),  onTap: () {},  ),  ListTile(  leading: Icon(Icons.*feedback*, color: Colors.*brown*.shade800),  title: Text("Feedback", style: TextStyle(fontSize: 16, fontWeight: FontWeight.*bold*)),  onTap: () {},  ),  ],  ),  ),  ],  ),  );  } }  splashscreen.dart  import 'package:flutter/material.dart'; import 'home\_page.dart';  class SplashScreen extends StatefulWidget {  @override  \_SplashScreenState createState() => \_SplashScreenState(); }  class \_SplashScreenState extends State<SplashScreen> {  @override  void initState() {  super.initState();  Future.delayed(Duration(seconds: 3), () {  if (mounted) {  Navigator.*of*(context).pushReplacement(  MaterialPageRoute(builder: (context) => HomePage()),  );  }  });  }   @override  Widget build(BuildContext context) {  return Scaffold(  body: Stack(  children: [  // Background Gradient  Positioned.fill(  child: Container(  decoration: BoxDecoration(  gradient: LinearGradient(  begin: Alignment.*topLeft*,  end: Alignment.*bottomRight*,  colors: [Colors.*brown*.shade300, Colors.*brown*.shade100],  ),  ),  ),  ),   // Centered Logo  Center(  child: Image.asset('assets/spit.png', width: 150, height: 150),  ),  ],  ),  );  } }  home.dart  import 'package:flutter/material.dart'; import 'faculty\_screen.dart'; import 'vision\_mission\_screen.dart'; import 'events\_screen.dart'; import 'feedback\_screen.dart'; import 'webview\_screen.dart'; import '../widgets/drawer\_menu.dart';  class HomePage extends StatelessWidget {  @override  Widget build(BuildContext context) {  return DefaultTabController(  length: 4,  child: Scaffold(  appBar: AppBar(  title: Text('MCA Department'),  bottom: TabBar(  tabs: [  Tab(text: "Faculty"),  Tab(text: "Vision & Mission"),  Tab(text: "Events"),  Tab(text: "Feedback"),  ],  ),  ),  drawer: DrawerMenu(),  body: TabBarView(  children: [  FacultyScreen(),  VisionMissionScreen(),  EventsScreen(),  FeedbackScreen(),  ],  ),  ),  );  } }  faculty\_screen.dart  import 'package:flutter/material.dart';  class FacultyScreen extends StatefulWidget {  @override  \_FacultyScreenState createState() => \_FacultyScreenState(); }  class \_FacultyScreenState extends State<FacultyScreen> {  int? expandedIndex;   final List<Map<String, String>> facultyList = [  {  "name": "Dr. Dhananjay Kalbande",  "designation": "Professor and HOD",  "image": "assets/dk.png",  "details": "Dr. Dhananjay Kalbande is a Post-Doctorate (TISS), Ph.D., M.E.(I.T.), B.E.(Comp.) Senior Research Fellow (NCW-TISS Project, T.I.S.S., Mumbai) Research Fellow (T.I.S.S. and M.I.T.(USA), CLIx-Project, Mumbai)"  },  {  "name": "Prof. Dr. Aarti Karande",  "designation": "Asst. Professor",  "image": "assets/ak.png",  "details": "Prof. Dr. Aarti Karande is a Ph.D (Computer engineering from S.P.I.T.), M.Tech (Computer Engineering from VJTI), B.E. (Computer Engineering from SAKEC)"  },  {  "name": "Prof. Sakina Salmani",  "designation": "Asst. Professor",  "image": "assets/ss.png",  "details": "Prof. Sakina Salmani is Pursuing Ph.D. in Computer (SPIT), M.E. Computers (DJSCOE), B.E. Computers (RCOE)"  },  {  "name": "Prof. Harshil Kanakia",  "designation": "Asst. Professor",  "image": "assets/hk.png",  "details": "Prof. Harshil Kanakia is Pursuing Ph.D. in Computer Engineering (SPIT), Executive PG in Data Science (IIIT Bangalore), M. E. Comps (SPIT), B. E. Comps (SPIT)"  },  {  "name": "Prof. Nikitha Mangaonkar",  "designation": "Asst. Professor",  "image": "assets/nm.png",  "details": "Prof. Nikitha Mangaonkar has done M.C.A, B.C.A"  },  {  "name": "Prof. Pallavi Thakur",  "designation": "Asst. Professor",  "image": "assets/pt.png",  "details": "Prof. Pallavi Thakur has done M.E. IT, B.E. IT"  },  ];   @override  Widget build(BuildContext context) {  return ListView.builder(  padding: EdgeInsets.all(10),  itemCount: facultyList.length,  itemBuilder: (context, index) {  return ExpandableCard(  faculty: facultyList[index],  isExpanded: expandedIndex == index,  onTap: () {  setState(() {  expandedIndex = expandedIndex == index ? null : index;  });  },  );  },  );  } }  class ExpandableCard extends StatelessWidget {  final Map<String, String> faculty;  final bool isExpanded;  final VoidCallback onTap;   ExpandableCard({required this.faculty, required this.isExpanded, required this.onTap});   @override  Widget build(BuildContext context) {  return GestureDetector(  onTap: onTap,  child: AnimatedContainer(  duration: Duration(milliseconds: 300),  curve: Curves.*easeInOut*,  padding: EdgeInsets.symmetric(vertical: 16, horizontal: 12),  margin: EdgeInsets.symmetric(vertical: 8, horizontal: 8),  decoration: BoxDecoration(  color: Colors.*white*,  borderRadius: BorderRadius.circular(10),  boxShadow: [  BoxShadow(  color: Colors.*black26*,  blurRadius: 5,  offset: Offset(0, 3),  ),  ],  ),  child: Column(  crossAxisAlignment: CrossAxisAlignment.center,  children: [  ListTile(  contentPadding: EdgeInsets.symmetric(horizontal: 8),  leading: CircleAvatar(  backgroundImage: AssetImage(faculty["image"]!),  radius: 40,  ),  title: Text(  faculty["name"]!,  style: TextStyle(fontWeight: FontWeight.*bold*, fontSize: 18),  ),  trailing: Icon(  isExpanded ? Icons.*keyboard\_arrow\_up* : Icons.*keyboard\_arrow\_down*,  size: 28,  ),  ),  AnimatedSize(  duration: Duration(milliseconds: 300),  curve: Curves.*easeInOut*,  child: isExpanded  ? Padding(  padding: const EdgeInsets.all(12.0),  child: Column(  children: [  Text(  faculty["designation"]!,  style: TextStyle(fontSize: 16, color: Colors.*grey*[700]),  ),  SizedBox(height: 10),  Text(  faculty["details"]!,  textAlign: TextAlign.center,  style: TextStyle(fontSize: 14),  ),  ],  ),  )  : SizedBox.shrink(),  ),  ],  ),  ),  );  } }  events\_screen.dart  import 'package:flutter/material.dart'; import 'package:url\_launcher/url\_launcher.dart'; import 'pdf\_viewer.dart'; // Import the new PDF viewer screen  class EventsScreen extends StatelessWidget {  final List<Map<String, String>> events = [  {  "title": "Upcoming Tech Conference",  "subtitle": "Click to visit",  "url": "https://mca.spit.ac.in/wp-content/uploads/2024/07/1.IntroductionOfACSES.pdf",  "image": "assets/event1.png",  },  {  "title": "Guest lecture on cloud computing",  "subtitle": "Learn the latest trends in cloud computing",  "url": "https://mca.spit.ac.in/wp-content/uploads/2024/07/3.CloudComputing.pdf",  "image": "assets/event2.png",  },  {  "title": "Mini Project Exhibition",  "subtitle": "Showcase innovative cloud projects.",  "url": "https://mca.spit.ac.in/wp-content/uploads/2024/07/4.MiniProjectExibition.pdf",  "image": "assets/event3.png",  },  {  "title": "CYBERSAGA E-Sport Event",  "subtitle": "Explore, Network, and Grow",  "url": "https://mca.spit.ac.in/wp-content/uploads/2024/07/5.DBMSGuestLecture.pdf",  "image": "assets/event4.png",  },  ];   @override  Widget build(BuildContext context) {  return ListView.builder(  itemCount: events.length,  itemBuilder: (context, index) {  final event = events[index];  return Card(  margin: EdgeInsets.symmetric(vertical: 8, horizontal: 16),  shape: RoundedRectangleBorder(borderRadius: BorderRadius.circular(10)),  elevation: 5,  child: Column(  crossAxisAlignment: CrossAxisAlignment.start,  children: [  ClipRRect(  borderRadius: BorderRadius.vertical(top: Radius.circular(10)),  child: Image.asset(  event["image"]!,  fit: BoxFit.cover,  width: double.*infinity*,  height: 180,  ),  ),  ListTile(  title: Text(event["title"]!, style: TextStyle(fontWeight: FontWeight.*bold*)),  subtitle: Text(event["subtitle"]!),  trailing: Icon(Icons.*arrow\_forward*, color: Colors.*brown*.shade700),  onTap: () => \_openPDF(context, event["url"]!),  ),  ],  ),  );  },  );  }   void \_openPDF(BuildContext context, String url) {  Navigator.*push*(  context,  MaterialPageRoute(builder: (context) => PDFViewer(url: url)),  );  } }  feedback\_screen.dart  import 'package:flutter/material.dart'; import 'package:flutter\_rating\_bar/flutter\_rating\_bar.dart';  class FeedbackScreen extends StatefulWidget {  @override  \_FeedbackScreenState createState() => \_FeedbackScreenState(); }  class \_FeedbackScreenState extends State<FeedbackScreen> {  final TextEditingController \_controller = TextEditingController();  double \_rating = 0;  bool \_anonymous = false;  int \_charCount = 0;   @override  void initState() {  super.initState();  Future.delayed(Duration(milliseconds: 300), () {  FocusScope.*of*(context).requestFocus(FocusNode());  FocusScope.*of*(context).requestFocus(\_focusNode);  });  }   final FocusNode \_focusNode = FocusNode();   void \_submitFeedback() {  String feedback = \_controller.text;  String message = \_anonymous  ? "Anonymous feedback submitted with rating: $\_rating"  : "Feedback: $feedback\nRating: $\_rating";   ScaffoldMessenger.*of*(context).showSnackBar(  SnackBar(  content: Text("Feedback submitted successfully!"),  duration: Duration(seconds: 2),  ),  );   showDialog(  context: context,  builder: (context) => AlertDialog(  title: Text("Thank You!"),  content: Text(message),  actions: [  TextButton(  onPressed: () => Navigator.*of*(context).pop(),  child: Text("OK"),  )  ],  ),  );   \_controller.clear();  setState(() {  \_rating = 0;  \_charCount = 0;  \_anonymous = false;  });  }   @override  Widget build(BuildContext context) {  return Padding(  padding: const EdgeInsets.all(16.0),  child: Column(  crossAxisAlignment: CrossAxisAlignment.start,  children: [  Text("Give Your Feedback", style: TextStyle(fontSize: 20, fontWeight: FontWeight.*bold*)),  SizedBox(height: 10),  TextField(  focusNode: \_focusNode,  controller: \_controller,  decoration: InputDecoration(  labelText: "Your Feedback",  border: OutlineInputBorder(),  counterText: "$\_charCount/250",  ),  maxLength: 250,  maxLines: 3,  onChanged: (text) {  setState(() {  \_charCount = text.length;  });  },  ),  SizedBox(height: 15),  Text("Rate Us", style: TextStyle(fontSize: 16)),  SizedBox(height: 5),  Center(  child: RatingBar.builder(  initialRating: \_rating,  minRating: 0,  direction: Axis.horizontal,  allowHalfRating: true,  itemCount: 5,  itemPadding: EdgeInsets.symmetric(horizontal: 4.0),  itemBuilder: (context, \_) => Icon(  Icons.*star*,  color: Colors.*amber*,  ),  onRatingUpdate: (rating) {  setState(() {  \_rating = rating;  });  },  ),  ),  SizedBox(height: 15),  Row(  children: [  Checkbox(  value: \_anonymous,  onChanged: (value) => setState(() => \_anonymous = value!),  ),  Text("Submit anonymously"),  ],  ),  SizedBox(height: 15),  Center(  child: ElevatedButton(  onPressed: \_submitFeedback,  style: ElevatedButton.*styleFrom*(  padding: EdgeInsets.symmetric(horizontal: 25, vertical: 12),  shape: RoundedRectangleBorder(  borderRadius: BorderRadius.circular(10),  ),  ),  child: Text("Submit", style: TextStyle(fontSize: 16)),  ),  ),  ],  ),  );  } }  pdf\_viewer.dart  import 'package:flutter/material.dart'; import 'package:webview\_flutter/webview\_flutter.dart';  class PDFViewer extends StatefulWidget {  final String url;  PDFViewer({required this.url});   @override  \_PDFViewerState createState() => \_PDFViewerState(); }  class \_PDFViewerState extends State<PDFViewer> {  late WebViewController \_controller;   @override  void initState() {  super.initState();  String encodedUrl = Uri.*encodeComponent*(widget.url); // ✅ Encode URL to prevent errors  String pdfUrl = "https://drive.google.com/viewerng/viewer?embedded=true&url=$encodedUrl";   \_controller = WebViewController()  ..setJavaScriptMode(JavaScriptMode.unrestricted)  ..loadRequest(Uri.*parse*(pdfUrl)); // ✅ Open in Google Drive PDF Viewer  }   @override  Widget build(BuildContext context) {  return Scaffold(  appBar: AppBar(title: Text("PDF Viewer")),  body: WebViewWidget(controller: \_controller),  );  } } |
| **Screenshots** |  |
| **Question and Answers** | Answer the following Questions::  1. How to create SideDrawer and Tabs Navigation both?  To use both a SideDrawer and Tab Navigation, wrap your Scaffold in a DefaultTabController, and include both drawer: and bottomNavigationBar: or TabBar in the AppBar.  Example:  DefaultTabController(  length: 3,  child: Scaffold(  appBar: AppBar(  title: Text('App with Drawer & Tabs'),  bottom: TabBar(  tabs: [  Tab(text: 'Tab 1'),  Tab(text: 'Tab 2'),  Tab(text: 'Tab 3'),  ],  ),  ),  drawer: Drawer(  child: ListView(  children: [  DrawerHeader(child: Text('Menu')),  ListTile(title: Text('Home')),  ListTile(title: Text('Settings')),  ],  ),  ),  body: TabBarView(  children: [  Center(child: Text('Content 1')),  Center(child: Text('Content 2')),  Center(child: Text('Content 3')),  ],  ),  ),  );  2. How did you use 60-30-10 rule in your application?  The 60-30-10 rule is applied as follows:   * 60% Primary Color: Main background (e.g., white or light blue) * 30% Secondary Color: Used in cards, containers (e.g., light grey, soft blue) * 10% Accent Color: Used in buttons, highlights, icons (e.g., orange or yellow)   In Flutter:  ThemeData(  primaryColor: Colors.white, // 60%  scaffoldBackgroundColor: Colors.white,  cardColor: Colors.lightBlue.shade50, // 30%  colorScheme: ColorScheme.fromSwatch().copyWith(secondary: Colors.orange), // 10%  );  3. Which new elements did you use for creating UI components?  Some newer or custom elements for UI:   * ExpansionTile – For collapsible views * PageView – For horizontal swiping screens * CustomPaint – For drawing custom UI shapes * BottomNavigationBar with IndexedStack – To keep tab state * SliverAppBar – For flexible scrollable headers * flutter\_animated\_dialog, animated\_text\_kit – For enhanced interactivity   4. In pubspec.yaml file, what dependencies need to be there?  It depends on features used. A sample for common UI features:  dependencies:  flutter:  sdk: flutter  cupertino\_icons: ^1.0.2  provider: ^6.0.5  http: ^0.14.0  flutter\_svg: ^2.0.7  webview\_flutter: ^4.2.2  expandable: ^5.0.1  animated\_text\_kit: ^4.2.2  shared\_preferences: ^2.2.2  5. How to create Expandable View?  You can use the built-in ExpansionTile or a third-party package like expandable.  Using ExpansionTile:  ExpansionTile(  title: Text('Click to Expand'),  children: <Widget>[  ListTile(title: Text('Child 1')),  ListTile(title: Text('Child 2')),  ],  )  Using expandable package:  ExpandablePanel(  header: Text('Expandable Header'),  collapsed: Text('Show more...'),  expanded: Column(children: [Text('More details here')]),  )  6. How to create WebView?  You can use the webview\_flutter package.  Step 1: Add to pubspec.yaml:  webview\_flutter: ^4.2.2  Step 2: Use in code:  import 'package:webview\_flutter/webview\_flutter.dart';  WebView(  initialUrl: 'https://flutter.dev',  javascriptMode: JavascriptMode.unrestricted,  ) |
| **Conclusion** | The MCA Department app was designed to provide a comprehensive, interactive, and user-friendly interface that connects students, faculty, and visitors to essential departmental information in an organized way.  By combining both SideDrawer and Tab Navigation, we ensured seamless access to all major sections of the app. Each module serves a specific purpose:   1. Faculty Information – Presented using expandable card views, allowing users to view detailed profiles of faculty members in a clean, readable format. 2. Vision and Mission – Also displayed in an expandable layout, highlighting the department's goals and philosophy in an elegant and accessible manner. 3. Notifications Section – Keeps students informed of upcoming events or activities with quick access to relevant web links for more details. 4. WebView Integration – Allows in-app browsing of the department website and related resources without leaving the application. 5. Feedback & Rating Form – Collects valuable feedback from users, encouraging continuous improvement and student engagement.   The use of the 60-30-10 design rule throughout the UI ensures the visual harmony of the app, balancing primary layout colors with attractive accents and intuitive interactions.  This app not only digitizes department communication but also enhances transparency, usability, and accessibility, creating a modern tool that supports the academic and administrative goals of the MCA department. |