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62 D15B.
DATE

MAD Assignment

Explain the key features and advantage of using flutter for mobile app develop.

(*) Single codebase for multiple platform write down one codebase for both platfo
(*) Hot Reload : Instantly see changes in the app without restarting making develop faster
(*) Fast Performance - Uses the Dart language and a compiled approach
(*) Open source & sharing community support.

Advantages

(*) Faster Development
(*) Cost Effective
(*) Reduced Performance

Discuss how the flutter framework differ from traditional approaches and why it has gained popularity in development comm.

Single codebase v.s Seperate Codebase
Traditional Approach: Developer need to write seperate code by Android.

Rendering Engine vs. Native UI comp
- Traditional Approach : Relies on pl
Native UI compo which can lead
to incosistencies and performance is

Why Flutter gained popularity ?
→ (i) Faster development with hot Deve
can install see UI changes
(ii) Cross platform efficiently : Busines
save time and resources by maint
a single codebase
(iii) Consistent UI Across devices . Si
flutter does not truly across
different or version
(iv) Improved performance : AOT
compilation and direct acces.

Q.2.
(a) Describe the concept of widget Tree
→ Widget Tree in Flutter.
In Flutter, the widget Tree is
the Fundamental structure, it
is heirarchal arrangement of
widget the UI is entrely built
Flutter UI is based using widget
can be statless . or The widget
widget tree determines

Input & Interaction Widget.
TextField - Accepts text input from user
Elevation Button . A button with elevg
Ex. column (
children [
TextField (decoration : InputDecorat r
ElevatedButton (
onPressed : () {
print ("Button pressed");
}
child : Text ("Submit")
)
}
]
/

Display & Styling
Text : displays text on the screen
Image :- shows images from n.w
Icon - Display icons
card :- A material design card with rounded

Ex. column(
children : [
Test ("welcome to Flutter , style
TextStyle (FontSize : 24
fontWeight : FontWeight .bold)

Example. class Profilecard extends {
final string name;
final string imageurl;
profilecard ({required this.name, req
@override
widget build (Build context)
return card (
child: colum:
children: [
Image.network(imageurl)
SizedBox(height: 10)
]}
}
]

(b) Provide examples of commonly us widget and their roles in creating widget.

1. Structure widget:
These widget act as the founda building the UI
Material App. The rest widget flutter app that provides efficient configuration.

Ex. MaterialApp (
home: Scaffold (
App.Bar

Discuss the important state management in Flutter application

In Flutter, state refers to data that can change during the lifetime

- User input
- UI changes
- Network changes
- Animation states

There are two types of states

Ephemeral state, small UI specific that doesn't get effect whole app

App wide states - Data stored across multiple widget

- Efficient UI updates Updates : Flutter UI rebuilt whenever state changes Efficient state management
- code Maintainability & scalability Managing state properly make the code modular.

compare and contrast the difference diff state management approaches available in Flutter such as set SetState provider and Riverpod

Provider : App wide state
Pros - Lightweight, recommended by Flutter, efficient
cons : Boilerplate code for nested provided
Best use cases : Medium scale apps

Riverpod App: wide state (More scalable
Pros : Eliminates Providers limitation
cons : Requires learning new concepts
Best cases : large apps nding gl state
Example .Shopping cart.

Q.4 Explain the process of integrating Firebase with Flutter.

→ Step (i)
Create a Firebase project
- Go to File console
click on "Add Project" and enter a project name
- configure google analytics.

Step(ii) Register the Flutter app with Firebase
- In firebase project dashboard click "Add App" and select
- For Android Enter android package name.

(iii) Install Firebase dependencies
Add Firebase dependencies
Firebase core
Firebase auth
cloud Firestore

Step (iv) configure figure for Android

Step (v) Initialize Flutter
void main () async {
widget Flutter Binding. ensure Initialized ();
await Firebase initial App()

Benefits of Firebase

(i) Easy to set up and scale
No need to manage backend
infrastructure scales automatically
(ii) Authentication
provides email/password
Google Facebook etc.
(iii) cloud Storage
secure the file storage
(iv) push Notification.