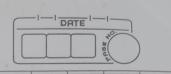
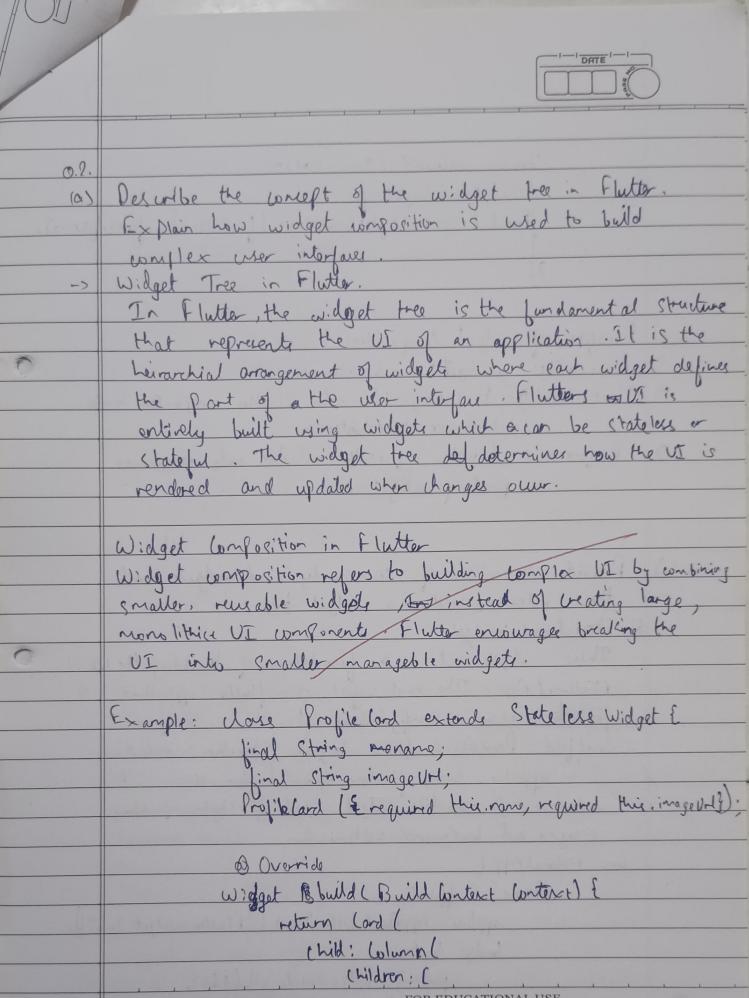
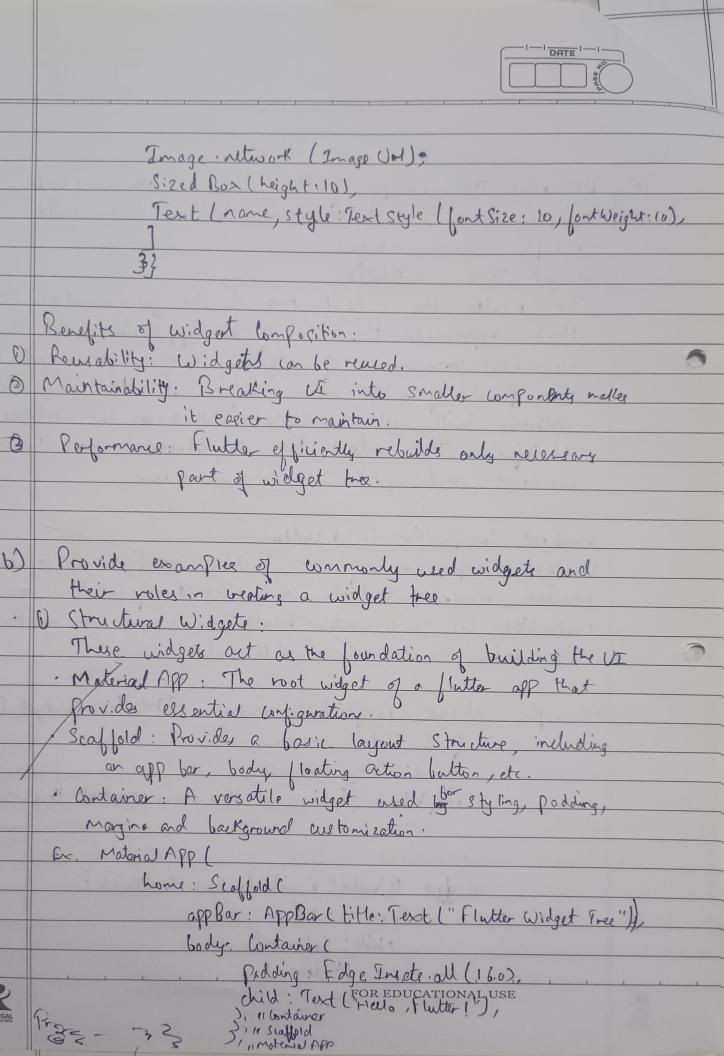
Name - Prathamesh Shetty Class - DISB Roll No: 53 MAD A seignment 1 Explain the Key features and advantages of using futter for mobile opp development. 1) Single Codo base for multiple platforms write one codebase for both android and ios, reducing development effort and mainte name. 2) Hot Reload -Instantly see changes in the app without restarting making developement faster and more interactive. 3 Fast Performance - when Uses the dart language and a compiled approach for smooth and high performance apps (4) Open source and strong community support -Backed by \$ 90091e and a large developer community, one wing continuous improvements and resources Advantages: 1 Forster Pevelopement Time: Hot reload and single cond co de base reduce developement time significantly. 2) Cost Effective: Since the code nune on both android and is businesses save on developement and maintepance 3) he duied performance issues: The app runs natively without relying on intermediate bridges like in react notive reducing lag. b. Discuss how the futter framework differ from the traditional approaches how and why it has gained Reputanity in the der community?

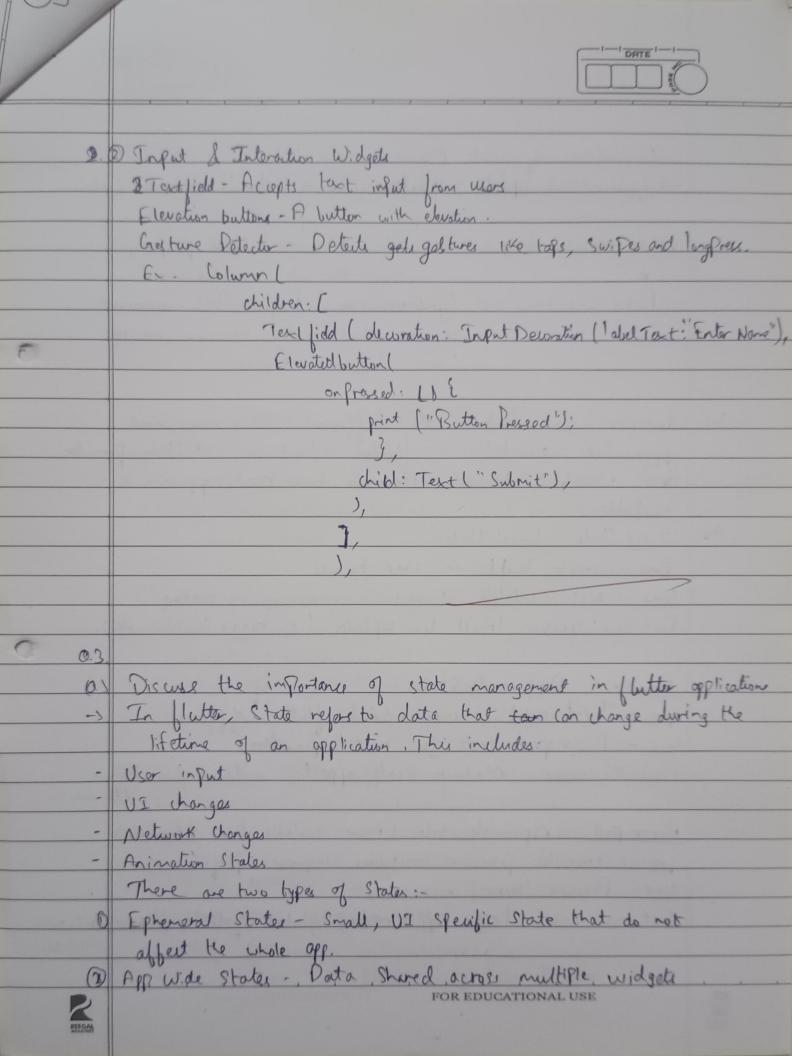


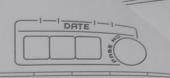
Ans O Single Code bace vs. Seperate Codebase
- Traditional approach: Developer need to write Seperate code for Andride and iOs · Flutter: Used single dant widebose for both Platforms reducing dents fine. 1 Kendoring Engine ve Native VI components Traditional Approach: Relies on Platform rative Uf components which can lead to imansistencies and performance issues. Flutter: Uses the silia rendering engine to draw everything from scratch ensuring a was start vi oxlacross devices. Why flutter has gained popularity? O Foster Development with Hot Reload - Instantly see UT changes after wide change. o Cross Platform Efficiency - Single dant wide base for Android and IOC. 3) Consistent UI - Flutter do not rely on native / VI amponents. 1 Improved Performance - PADT consilation and direct a cress to bill one we month arimations. Easy interminte gration with Backend Tenhnologies: Works well with Firebose, ferrest API's braphal and other bowerd.











Importance of State Management - Efficient US updates - Flutter US is rebuilt whenever state changes. - lude Maintainability and Stalability: - Managing State proporty makes the under modular. Data bonsisterey and Synchronization: - Proper State management engures that data remains consistent a cross different sucons. compare and Contrast the different Stater management approaches available in futter, such as set State, provider and fever god. Provide Scenariose where out approach is cuitable. And Siset State. Local State Pros - Simple built in lose to use Cons - Not scalable, causes un necessary re-rondors Best Use cases - Small VI updates (eg. toggle Switch, counter). Provider - App wide State from - light weight, recommended by flutter, officient was - Ballo plate code for nexted providers. Best Use cases - Medium Scale apps log authentication, themas, API datas River pod - App-wide state (more scalable than Aprovider) pros- Fliminates providers limitations, Improved Performance. cons - Requires learning new concepts best we case - Large opps reading global state (eg. Shopping Cont. was



Scenarios for each opproach · Use state while managing simple UI elemente within a & single widget like toggling clark made in a setting screen. · Use provider when sharing state across multiple widgets such as managing war and authentication · Uso river Pod when weating a complex scalable aff. (a) Explain the process of integrating tirefore with a flutter of application. Discuss the benebits of using Fireboxe. -> Firebase provider a powerful faction for futher application offering cervices like authentication, real fine clatabases, cloud functions storage and more. Steps to integrate firebase with flutter: 1) Create a fire love project - Cro to firebose Console -- Click 'Add Project' and enter name - lonjique google panalytils Degister the flutter of with fireboxe - Click "Add App" and Select Android or ios - For andrid, enter the andrid grackage rame and download the georgle services 3 Install firebose dependencies. firebose were, fiber firebase anth, cloud firestore
- Run flutter pub get FOR EDUCATIONAL USE





- De Configure Firebase for Android or 10s.

  + Opens android/bild.gradle and ensure com.google.gms.

  google-services 2. 4.3.10!
- 3 Initialize firebase in futter

Benefits of using firebose

Firebose is a Baskend-as-a-Sovice (Boos) tol that simplifies

backened development for further appr. Here are some kaykey

banefits.

- D Every to Setup and Scale
- @ Provides weer authentication
- 3 Cloud Storage
- @ Push notifications
- @ Nosal database

(b) trightight the first firebace services commonly used in fruiter development and provide a brief overview of how data synchronisation is a achieved.

Simplify flutter app development

O fivebase Authentication

I and third party privides like google, facebook and papple.



B Cloud firestone

Stores and Synes data in real time across devices. Supports
etructured data, queries and offine across.

eg. Fibre Firestone. instance. collection ('cusers'). add ('E

'name': John Doe'"

'crnail': 'john doe @ example.com',

3);

- B Realtine Database

  A realtine joon bersed database that automatically updates

  data cubss devices

  ex- Database reference ref = fireface latabase instancing!" message

  ref. Sct (&"fext": "Hello, Firebase!");
- Enables push notifications and auth messaging between wors.
- Tracks wer interactions and app performance
- Deploys and serves web applications securely with automatic SSL.





Data Synchronization in firebase Firebase ensures realtime data synchronization across multiple O Was real time listeners to update UI instantly when data changes. Ex- Fireboye Firestore. instance, collection ("users") - snapshatel. for (var doc in Irapshot. docs) { Print ( doctinane"); D'Realtine Patabase Syne Mechanism. Uses persistent web socket connections for live updates. 3 Offline data sync Firebase coches data locally and Synus changes when the a boud functions for automated updates updates when data changes.