FLUTTER PRACTICE PROBLEMS

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DART (CLO-1)

Question A1:

Write a program that takes the command line arguments of types string, integer and decimal value. In case of a string, its length should be displayed, for an integer value, it should be multiplied by 100, and for a decimal value, we need to take its power of 3.

Question A2:

Initialize a list of records, consisting of name and age values. Sort list with respect to name and then with age.

Question A3:

Initialize a list of integers, 10, 20, 30, 40.
Create another list using the first list, such that at its initialization, the new list is initialized like this:
Item 1: 10, Item 2: 20, Item 3: 30, Item 4: 40.

Question A4:

Suppose we have initialized a list of 4 integers. You need to sum the elements of the list without using any loops or calling list elements through their indexes.

Question A5:

Suppose we have two numbers a=10 and b=20. You need to swap the numbers without using any third temporary variable, or any arithmetic or logical operators.

Question A6:

Suppose you have a range of numbers, and their respective grades:
10 – 30, grade E
31 – 50, grade D
51 – 70, grade C
71 – 90, grade B
91 – 100, grade A

Write a switch – case statement, that takes the marks and show the grade.

Question B7:

Initialize a list of Map with the following items:

{"position": 10, "name": "Jawad"},

{"position": 33, "name": "Faisal"},

{"position": 4, "name": "Zahid"},

{"position": 6, "name": "Ali"},

{"position": 9, "name": "Noman"},

{"position": 4, "name": "Ben"},

Sort the list with first with respect to position, and then with respect to name in case the positions are same.

Question B8:

Initialize a list of Map with the following items:

{"name":"Ali", "age":45, "marks":32 },

{"name":"Noman", "age":32, "marks":23 },

{"name":"Faisal", "age":41, "marks":43 },

{"name":"Noman", "age":11, "marks":43 },

{"name":"Faisal", "age":8, "marks":43 },

Print those records whose age is greater than 30 and whose name is either Noman or Faisal

---

Question A8:

Write an example of function definition and function call with named parameters.

Question B2:

Write arrow functions for the following equations:

$A = a^2 + b^4$

$Z = p^2 + 5\text{t} + \text{A}$

Question A9:

Write arrow functions for the following equations:

$A = x^2 + 2xy + p.Z$

$Z = a^2 + 4.B^2 - 8b + 2a$

$B = n^2 + qn + 1$

Question A10:

Suppose the equation is:

$Z = x^2 + 4y^2 - 8N^2$

Where N is represented by a separate equation:

$N = p^2 + q^2$

Solve ‘Z’ with arrow function, such that you need to define the arrow function N within the body of Z.

Question A13:

Given the following list: ['apples', 'bananas', 'oranges'];

Append a string with each element of the list and capitalize each element of list. Use a combination of map and forEach function.

Question A14:

Create a small calculator application using typedef functions performing these operations, add, subtract, multiply, and divide.

Question A15:

Suppose you have the following array,

```
List<Map<String, String>> myArray = [
  {'name': 'ali', 'age': '45'},
  {'name': 'noman', 'age': '34'},
];
```

Display the key and value of array elements using for and forEach.

Question A16:

Suppose we have the following arrays:

```
var myArray1 = [3, 4, 5]
var myArray2 = [6, 7, 8]
```

Write code to append the myArray2 into myArray1.

Question A17:

Suppose we have an Dart object { 'name': 'Devin', 'hairColor': 'brown' }
Write code to change value of hairColor using spread syntax (…) three dots.

Question A18:

Write an example of defining an arrow function within another arrow function.

Question A19:

Create a class Person with attributes: id, name, age.

Derive two classes from person, named Student and Teacher.

The extra attributes of Student are cgpa, currently enrolled semester (e.g., FA22 or SP22, etc), admission date.

The extra attributes of Teacher are salary, designation (Lecturer, Assistant Professor, Professor, etc), department, and joining date.

Populate a list of at least 3 records in each class using class objects.

A user should be able to search a student or teacher with the provided ID. You should store objects of Teacher and Student in a list.

Print list of students whose cgpa is greater than 3.7.

Question A20:

Given the following list of objects (name, age, marks), you need to write myObjects.where().forEach() function, so that the name, age, and marks of those students are printed on screen whose age is greater than 25 and marks are greater than equal to 50, and name is Alice or Bob

```
myObjects.add(Student(name: 'Alice', age: 25, marks: 55));
myObjects.add(Student(name: 'Bob', age: 30, marks: 50));
myObjects.add(Student(name: 'Alice', age: 27, marks: 40));
myObjects.add(Student(name: 'Charlie', age: 22, marks: 45));
```

Question B1:

Given the following list of objects, you need to write myObjects.where().forEach() function, so that the name, age, and marks of those students are printed on screen whose age is greater than 30 and name is Noman or Faisal.

Student(name:"Ali", age:45, marks:32),

Student(name:"Faisal", age:41, marks:43),

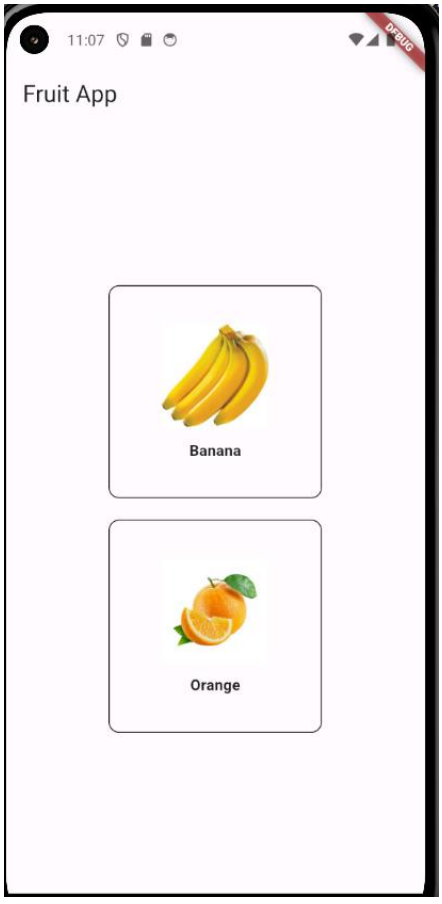
Student(name:"Noman", age:11, marks: 43),

Student(name:"Faisal", age:8, marks:43)

FLUTTER WIDGETS (CLO-2)

Question C1:

Make an app in Flutter that shows the following on screen:



To load an image from the assets folder in Flutter, you need to follow a few steps. Let's make sure everything is set up correctly:

1. **Folder Structure:**
    - Create an `assets` folder in your project root directory (if it doesn't already exist).
    - Inside the `assets` folder, create an `images` subfolder (or any other name you prefer).
    - Place your image file (`banana.jpg`) inside the `images` folder.
2. **Update** `pubspec.yaml`**:**
    - Open your `pubspec.yaml` file.
    - Under the `flutter` section, add the following lines to specify the assets:
    - `flutter:`
    - `  assets:`
    - `    - assets/images/`
    - Make sure the indentation is correct.
3. **Image Loading:**
    - Now you can load the image using the `Image.asset` widget.
    - The asset name should be relative to the `assets` folder. In your case, it's `"assets/images/banana.jpg"`.

Question C2:

Write a flutter app to show the grade of a student for the given marks. The marks are passed as an argument to the constructor of the widget class computing the grade. The computed grade is shown in the Text widget. Here is the grade distribution for different marks ranges:

< 50 --- F

>= 50 and < 60 --- E

>= 60 and < 70 --- D

>= 70 and < 80 --- C

>= 80 and < 90 --- B

>= 90 --- A

Question C3:

Use constructor arguments to pass names of students from a Name() widget to an Attendance() widget. The following should be the output by Attendance() widget, where Present or Absent status is randomly generated.

Ali Khan	Present
Noman	Present
Faisal	Absent
Javed	Absent

Question C4:

Write code to add a button in Flutter. The text showing in the button should be Click Here. When the button is clicked, a Snackbar should be shown with message “hello world”.

Question C5:

Write the code of TextFied() widget function.

When a user enters any text in the TextField(), it is also automatically written in another TextField() in capital letters.

Question C6:

Write a flutter program in which when a button is clicked, the text of first TextField() is assigned to second TextField()

Question C7:

Write a flutter code, so that when the button is clicked, the text “hello world” should be shown in the Text() widget, and the button should be disabled.

Question C8:

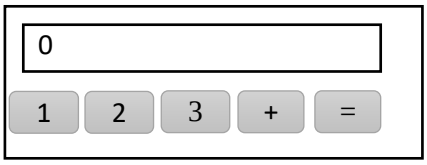
Create a simple registration page in Flutter asking for user’s email and name. When the user clicks on register button, the information should be shown using Text widgets. If any input is missing, snackbar message should be shown about the missing element. Use TextEditingController() class to get values of TextField().

Question C9:

Suppose you have two TextField(), each containing a number, and a button to add the values of the two TextField(). When the button is clicked, the values of the TextField() are added and result should be shown in a Text() widget.

Question C10:

The following layout has three number buttons, a plus and equal operator, and a TextField() initialized with a zero “0”.



The user should be able to enter an expression like this: 423+35+223. When the user press the equal button, the answer should be shown in the TextField().

Question C15:

Show a list of students, such that :

ID	Name	CGPA
1	Javed	3.0
2	Noman	2.7
3	Ali	3.7
4	Faisal	3.3
5	Shahid	4.0
6	Kamal	3.1
7	Zahid	2.3

The students whose CGPA are in the range between 2 and less than 3 should be shown in bold and red font.

The students whose CGPA are in the range between 3 and less than 3.7 should be shown in blue font without bold

The students whose CGPA are greater than and equal to 3.7 should be shown in italic, bold, and green font.

Question C35:

Write code to show the following list using flutter <ListView> widget

[{name: ‘Ali’, age: 33, city: ‘Karachi’}, {name: ‘Faisal’, age: 20, city: ‘Lahore’}, {name: ‘Noman’, age: 53, city: ‘Karachi’},]

Question C33:

We have following record of students:

RegNo	Name	Marks
1	Ali	80
2	Noman	60
3	Faisal	40
4	Javed	55

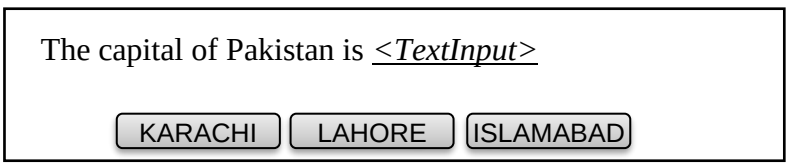
You need to show the above record map function flutter’s ListView widget. Display a 4th column in the output that displays ‘pass’ if marks are greater than 50 and fail otherwise.

For example:

RegNo	Name	Marks	Status
1	Ali	80	Pass
2	Noman	60	Pass
3	Faisal	40	Fail
4	Javed	55	Pass

Question C34:

You have a layout as given in the following.



You need to write a “single method” for all the three buttons. The prototype of method is:

function button_Click().

In this method, you need to get the text of the button clicked. If the text is matching with the string “ISLAMABAD”, the <Text> should be assigned value ISLAMABAD, otherwise it remains blank.

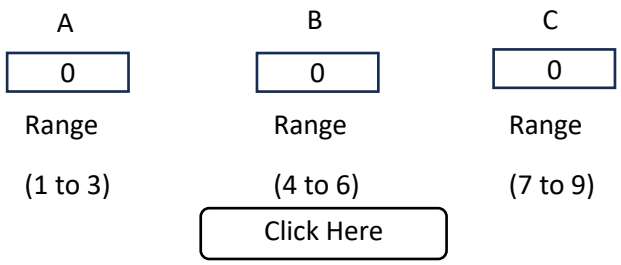
Question D1:

Write code to show the following list using flutter GridView widget

[{name: ‘Ali’, age: 33, city: ‘Karachi’}, {name: ‘Faisal’, age: 20, city: ‘Lahore’}, {name: ‘Noman’, age: 53, city: ‘Karachi’},]

Question C30:

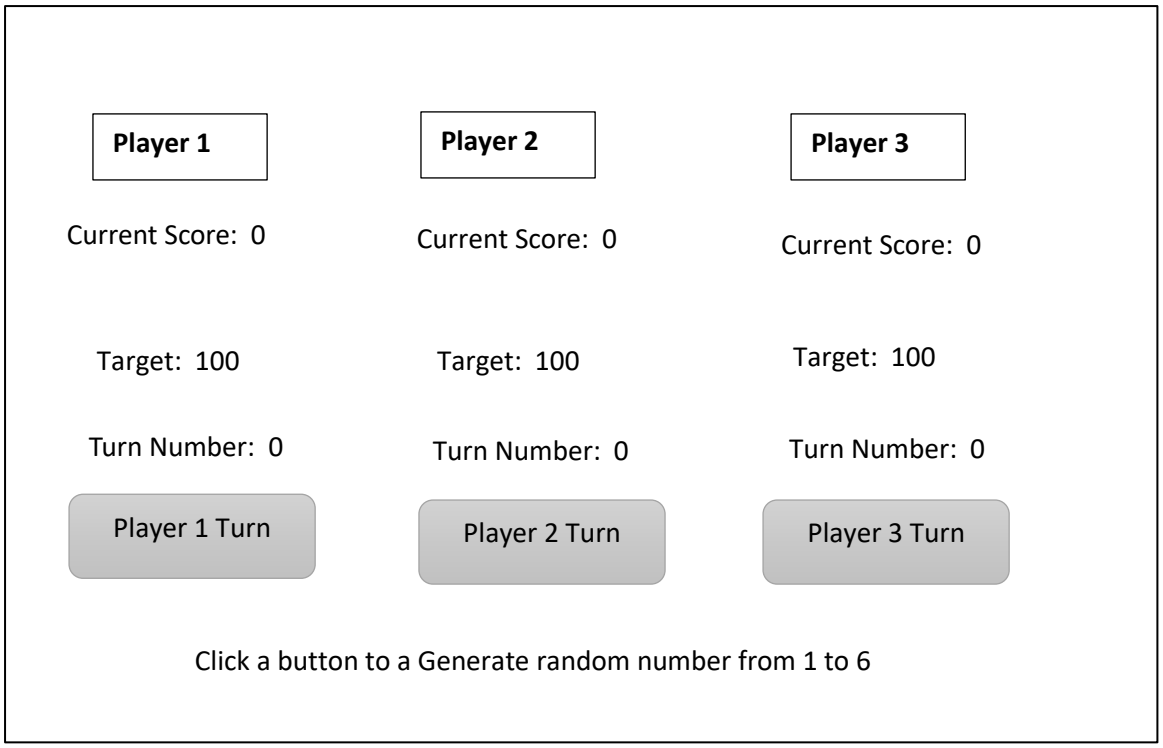
Given the following design:



You need to generate a random number from 1 to 9. If the random number is from 1 to 3, increment by one in text box A, if the random number is from 4 to 6, increment by one in text box B, if the random number is between 7 to 9, increment by one in the text box C. The program should stop executing when any of the text boxes value crosses 5.

Question C31:

We want to implement a cricket scoring game machine. It is a competition between 3 three players. Each player has to reach a target score of 20. Each player will play at his turn (when his button is enabled). At one time, the button of one player is enabled who has current turn. When a player reaches 20, his button should be disabled forever, and the competition will continue between remaining two players. When the second player will win, game will be over, and the players and their final scores and number of turns should be displayed on the screen as Match Summary (see below).



Match Summary

1st : Player 2, Score 101, No of Turns: 20

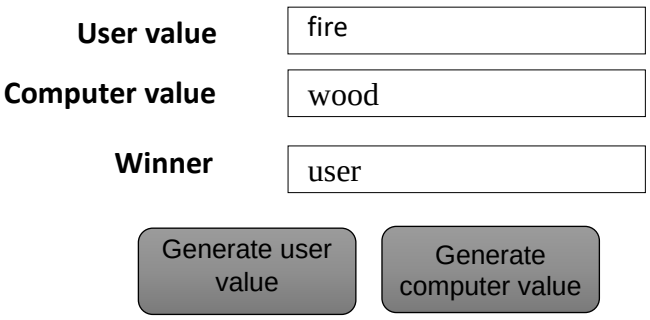
2nd: Player 1, Score: 105, No of Turns: 23,

3rd, Player 3, Score: 67, No. of turns: 24

(In above, we are first sorting on base of score, and then on base of number of turns).

Question C32:

Suppose you want to build a game in which a random value is generated representing fire or wood or water on button click. Another random value representing fire or wood or water is generated for computer on button click. The winner is decided on the following priority: Fire > Wood, Wood > Water, Water > Fire. The player that gets the higher priority value is the winner. If both get same priority value, it is draw. Write the flutter design and code.



Question C38:

Suppose you have an <Text> field and two buttons. The first button is labeled as BLUE and the second button is labeled as GREEN. When the BLUE button is clicked, the color of text in <Text> should changed to BLUE, and when GREEN button is clicked, the color of text in <Text> should change to GREEN..

Question C39:

Suppose you have a layout like the above. In the below example, the blue button is clicked, and its text size is increased and text color is changed to black.

The buttons are created by using array of color names, and the text in the buttons is shown in upper case. When a button is clicked, the color of the text below is changed and the name of color is shown as shown in the above example. Moreover, the button that is clicked has font weight changed to bold and font size increased to indicate which button is currently clicked.

Question C11*:

You need to develop a snakes and ladders game, as shown below:

The snakes & ladders board can be downloaded from:

http://hancockmcdonald.com/sites/hancockmcdonald.com/files/file-downloads/SnakesLaddersBoard.jpg

The player image can be downloaded from:

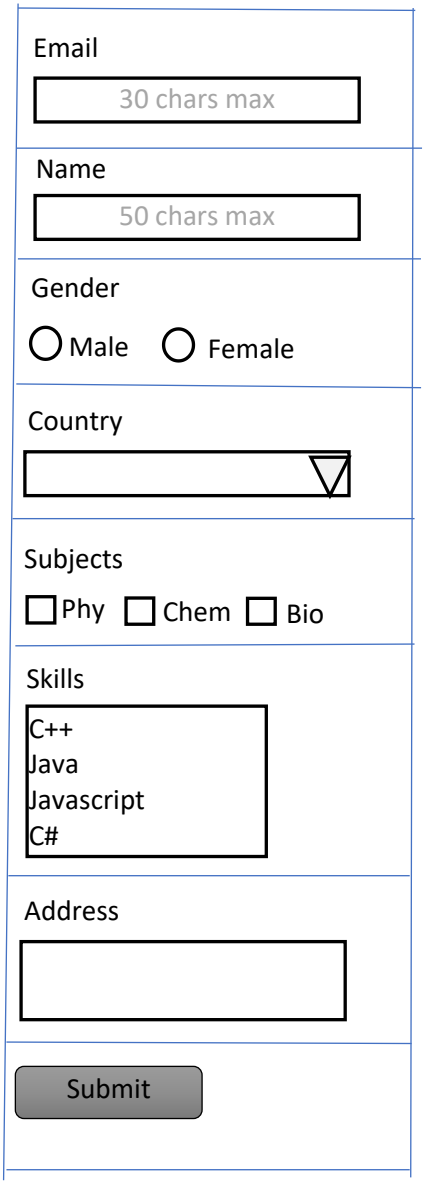
http://clipart-library.com/images/kT85jnpXc.png

(NOTE: You may change background board or player images).

The player will promote or demote based on arrival on ladder or snake head respectively. Implement complete logic. The game should end when a player crosses last digit.

Question C18*:

You need to create a mobile phone portrait layout:

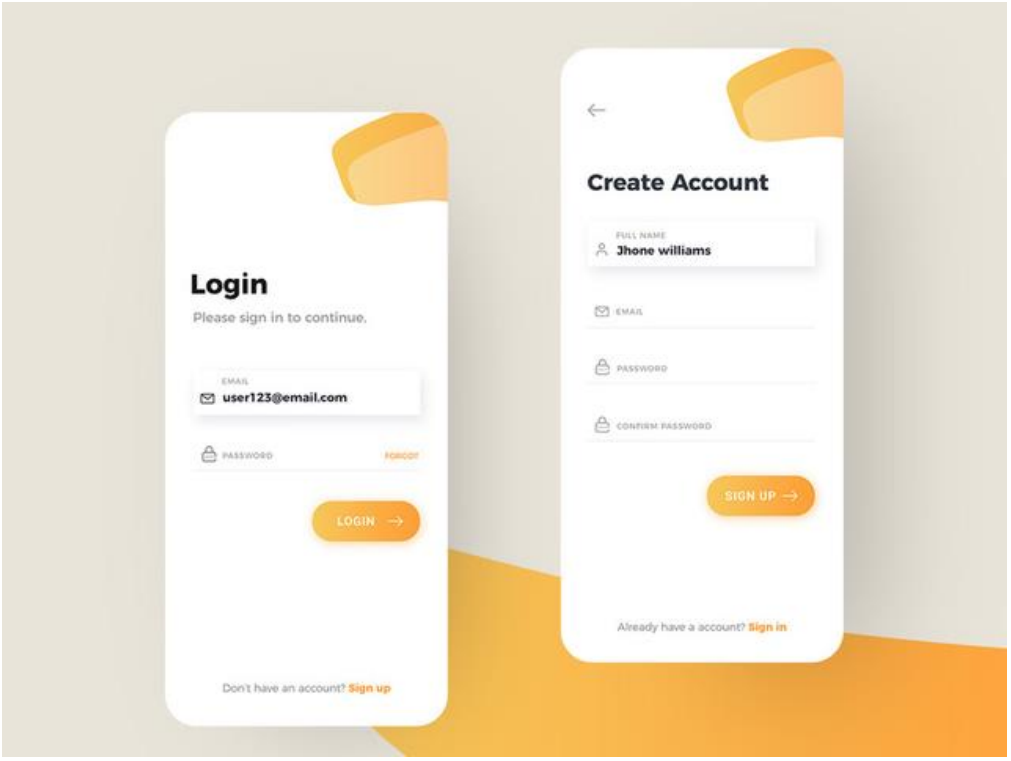


When the same app is opened in a tablet layout (landscape), it should display like this.

Email	30 chars max	Name	50 chars max
Gender	○ Male ○ Female	Country	▽
Subjects	☐ Phy ☐ Chem ☐ Bio	Address	
Skills	C++ Java Javascript		Submit

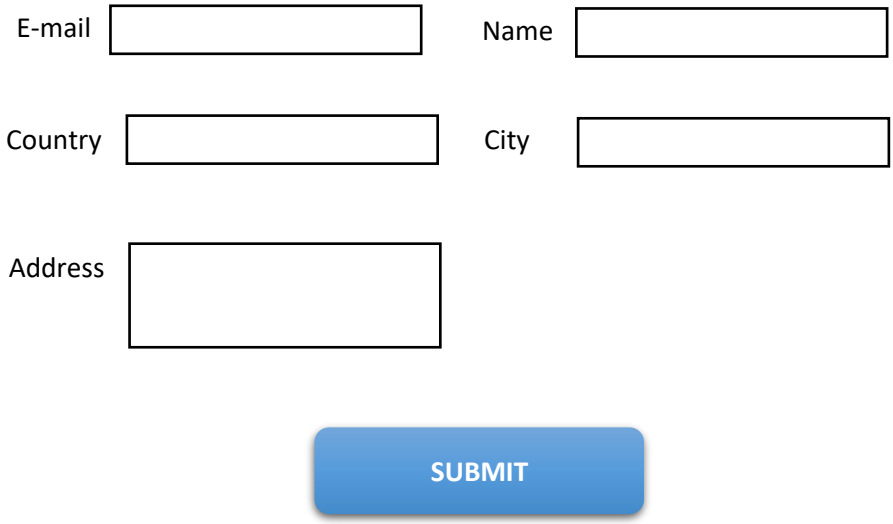
Question C41:

Create a login and a registration page, with proper flutter styling. Here is a sample, but your work can be different and better than this.



Question C40:

Write the following layout.

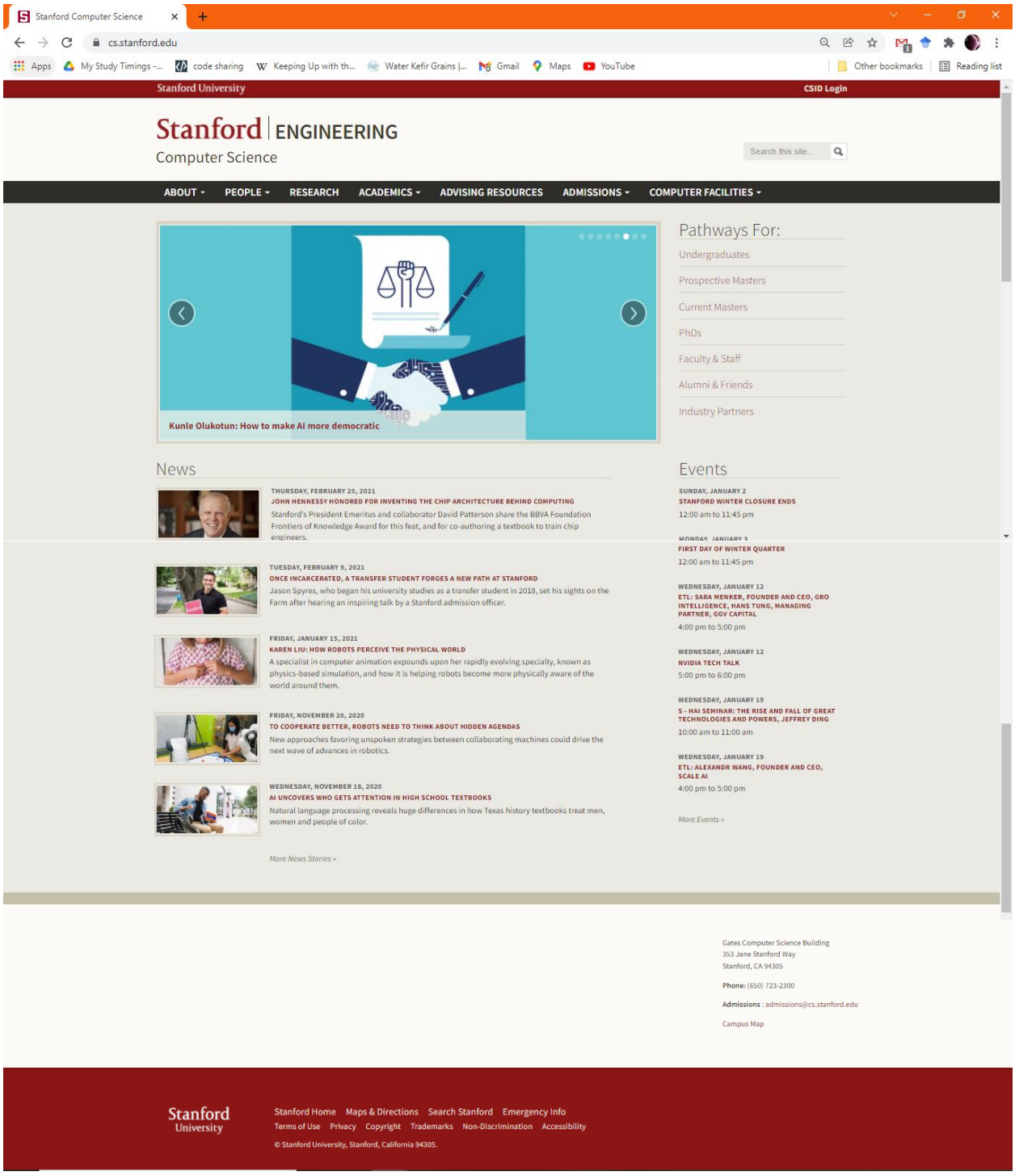


When the screen size is reduced, the layout should be changed to:

Note that labels are showing “above” the text boxes.

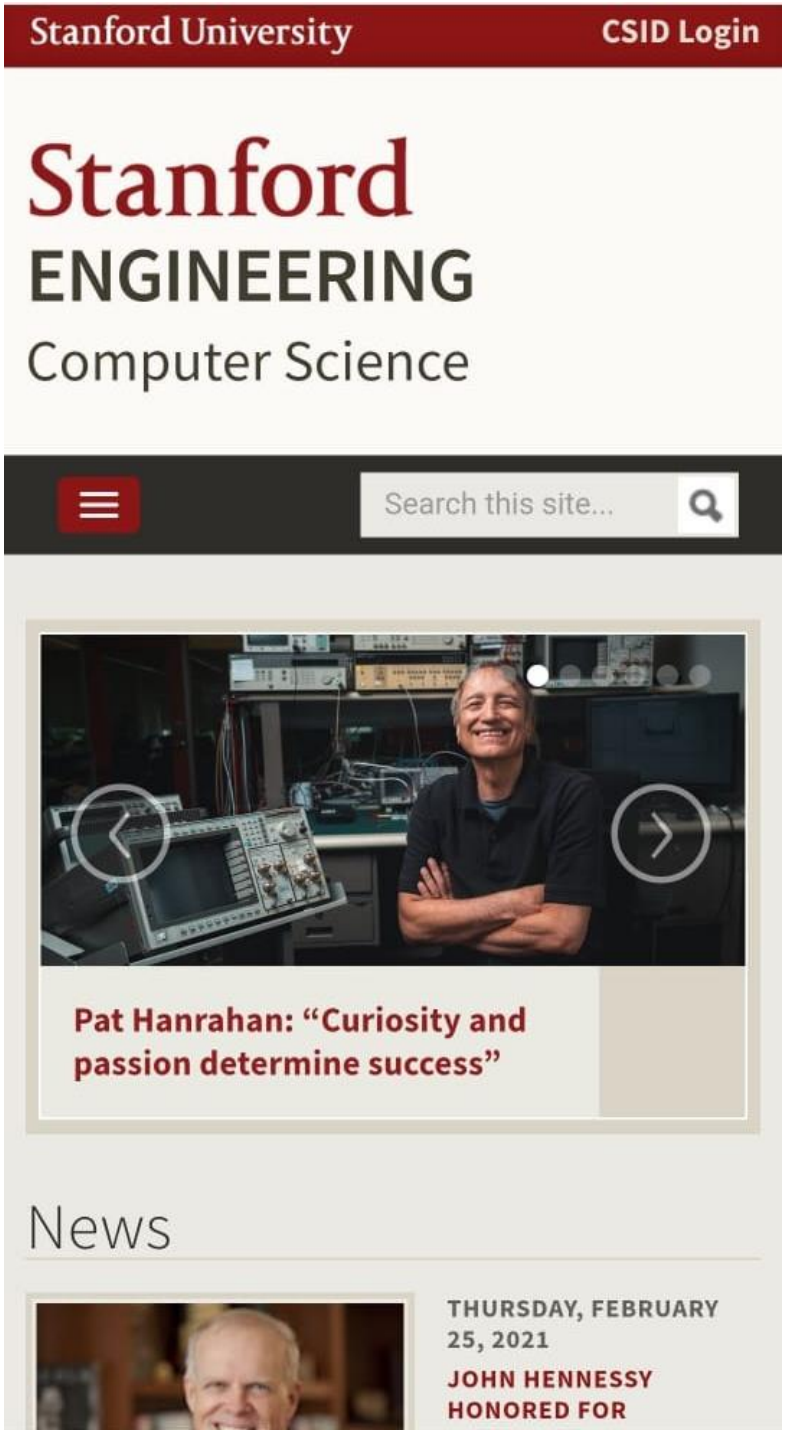
Question C12*:

The following is the website view of Standford university's computer science department.



You need to re-design the above view in mobile layout as follows:

You may need to use scrolling.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Stanford's President Emeritus and collaborator David Patterson share the BBVA Foundation Frontiers of Knowledge Award for this feat, and for co-authoring a textbook to train chip engineers.

TUESDAY, FEBRUARY 9, 2021

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Jason Spyres, who began his university studies as a transfer student in 2018, set his sights on the Farm after hearing an inspiring talk by a Stanford admission officer.

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A specialist in computer animation expounds upon her rapidly evolving specialty, known as physics-based simulation, and how it is helping robots become more physically aware of the world around them.

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ABOUT HIDDEN AGENDAS

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SUNDAY, JANUARY 2

STANFORD WINTER CLOSURE ENDS

12:00 am to 11:45 pm

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FIRST DAY OF WINTER QUARTER

12:00 am to 11:45 pm

WEDNESDAY, JANUARY 12

ETL: SARA MENKER, FOUNDER AND CEO, GRO INTELLIGENCE, HANS TUNG, MANAGING PARTNER, GGV CAPITAL

4:00 pm to 5:00 pm

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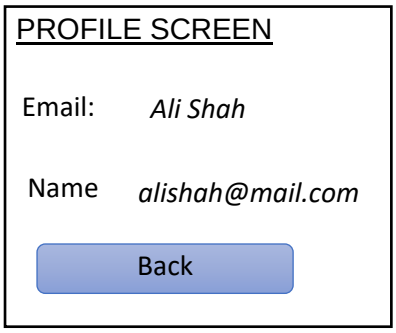
NAVIGATION IN FLUTTER (CLO-3)

Question A7:

Write code that launches a screen Display from Home screen. Send two numbers from Home to Display, where they should be shown separately in TextField widgets.

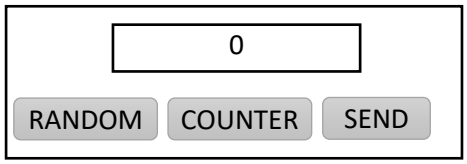
Question A11:

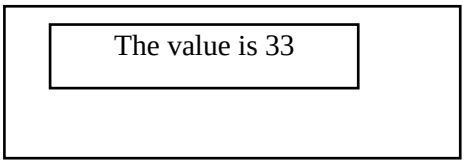
We have two navigation screens as shown below. Name and email are input in the home screen and when the submit button is clicked, the values are passed to profile screen (using RouteSettings) where they are simply displayed. You need to write the widgets of homescreen and profilescreen.



Question A12:

Suppose we have a layout like this

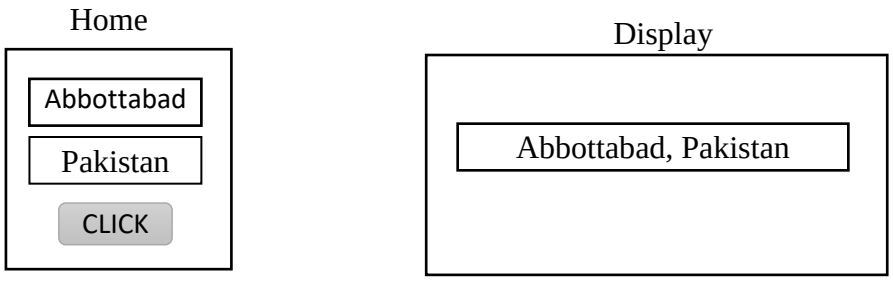




Write code for button RANDOM such that when user click button, a random number from one to hundred is shown in text box. Write code for button COUNTER such that when the user click the button, the value in the TextField start incrementing. Write code for button SEND such that when user click on button, the value in TextField is passed to a new screen (Display) and shown as indicated in the figure.

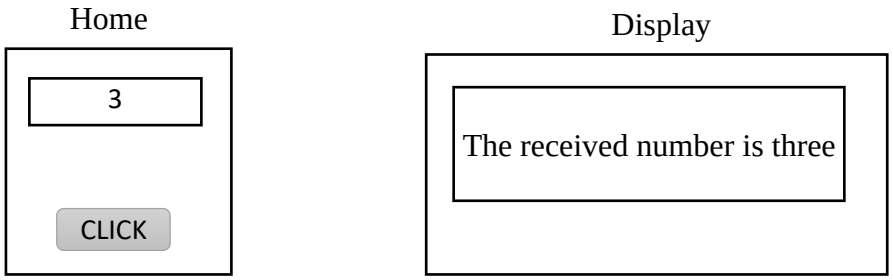
Question A21:

When the user click on button in Home screen, the both strings in TextFields should be passed separately to the Display screen where they are shown as concatenated string in display function of Display screen.



Question A22:

Pass a number from 1 to 3 from the Home screen to the Display screen. In the Display screen, check which of the number is received, and then write the number in words.
For example, you passed 3 from Home screen, and in Display screen, you will print "three" as shown below.



Question A23:

Use Flutter Widgets to design following screens:

Login screen (the initial screen)

This screen shows user name and password

Home screen

This screen will appear when user enters correct user name and password.

It will show some main categories like:

COMPUTERS, LAPTOPS, HARD DRIVES, FLASH MEMORIES, ETC.

You can use ListView to show above categories. Apply the proper theme and styling.

When any of the category name is clicked a new screen should open showing sub-categories of that parent category, and the title of the page should change to the parent category.

For example, when LAPTOPS is clicked the new screen can show models of different laptops along with their pics and prices:

HP Pavilion 15

Dell Inspiron

Sony Viao

And so on

When a laptop model is clicked, its individual detail should be shown on separate screen.

You can use different .dart files for different screens and then use import to call in main.dart.

Each subcategory page should have back navigation button and a button to navigate directly to the home screen.

Please make beautiful interfaces, some samples are attached, but you can find more on flutter.dev.

Question A24:

Create an app with 4 screens, and use Tab navigation to navigate between screens

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Question A25:

Create an app with at least 2 screens. Dynamically change the header title of the second screen when it is loaded.

Question A26:

Create a screen with a banner having a search button and signin / signout buton. When the user clicks on signin button, it changes to signout button and vice versa.

Question A27:

Create an app with 4 screens, screen1, screen2, screen3, and screen4. Use grouping with Tab navigation to place screen1 and screen2 in tab 1 and screen 3 and screen 4 in tab 2

Question A28:

Create an app with 4 screens, and use Drawer navigation to navigate between screens

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Question A29:

Create an app with 4 screens, screen1, screen2, screen3, and screen4. Use Drawer navigation based grouping to place screen1 and screen2 in drawer 1 and screen 3 and screen 4 in drawer 2

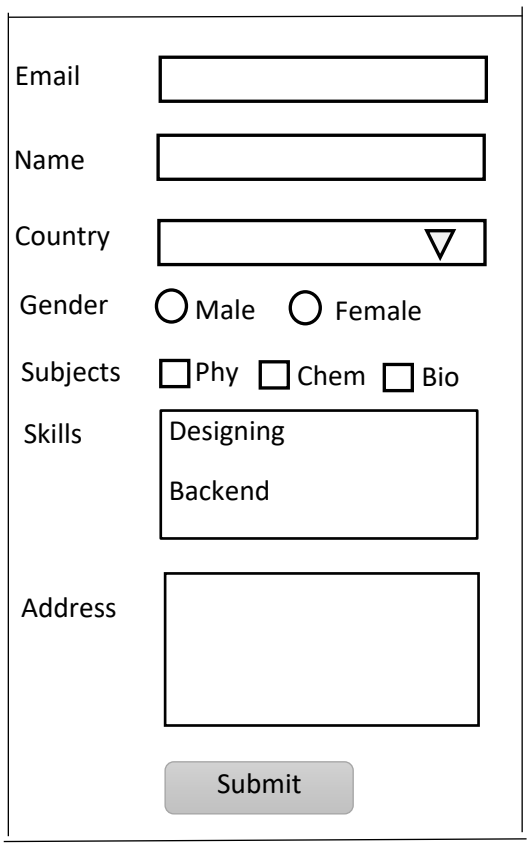
Question C13:

Create the following Form

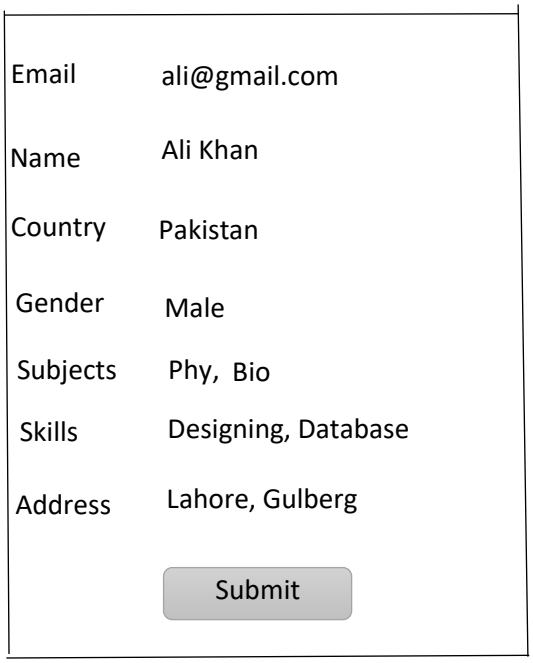
The data is input on the “input screen”.

When the user clicks the submit button, the data is sent to the “display screen” as shown below.

INPUT SCREEN



DISPLAY SCREEN



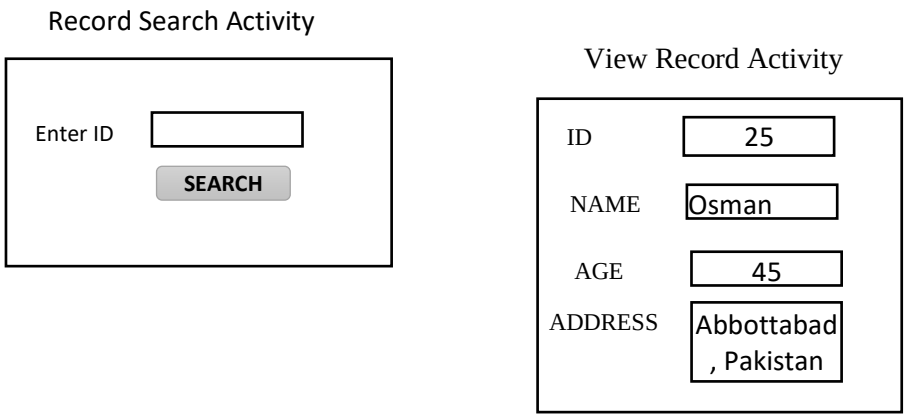
Question C19:

Create two screens screen1 and screen2. Share global data between the screens containing fields: name and age. Also change the values of the name and age in screen2.

DATABASE CONNECTIVITY IN FLUTTER (CLO-4)

Question C20:

Write an application that asks for an ID from user in RecordSearch screen. When the user enters the ID, the record is shown against the ID in the RecordView screen. The record is fetched from SQLite Database.



Question C21:

Write a program to store the following key value pairs using Shared preferences in Flutter. Create a function to save the information, and a function to retrieve the information..

{‘name’:’Ali’, ‘Age’:’45}

Question C22:

You need to create a mobile application using flutter firestore database. Here is the description of the application.

Customer:

A module to contain customers information that can purchase products from the application

Products:

A module of products. Each product can have multiple pictures uploaded to fire store file storage.

Order:

A module that contains orders for various products, the orders are placed by the customers.

Order Details:

A module that contains order id, and information about products purchased by a customer.

You need to:

Develop a customer module where a customer can place various orders. The products should be maintained in a shopping cart. On checkout a textinput will be provided to enter a fake card info.

A seller module where he can add products and can see the orders placed by the customer. The seller should be able to complete the orders as we usually see in e-commerce applications.

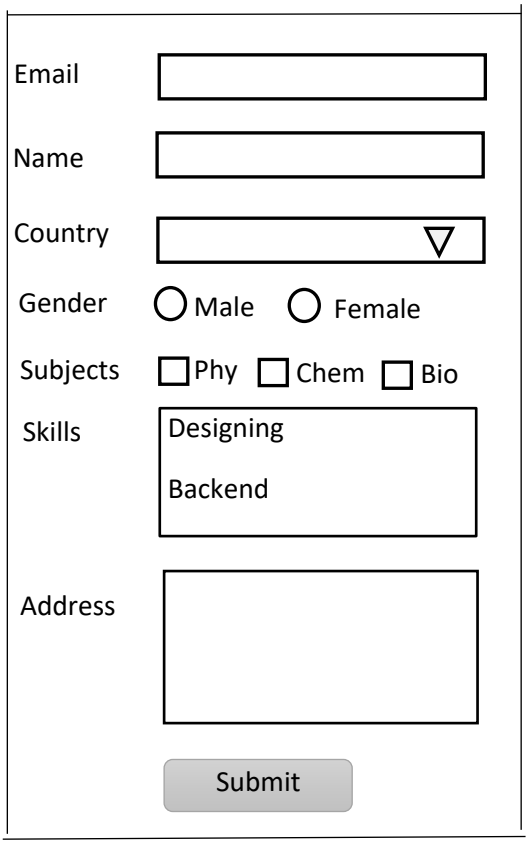
Question C14*:

Use the tab navigation or drawer navigation to show menu for the assignment.

You need to store and retrieve data from Firestore database.

The user will perform input of data in the following screen. When the submit button is clicked, the data is uploaded in firestore as a new document in the collection “persons”. You may also need subcollections for subjects and skills.

INPUT DATA SCREEN



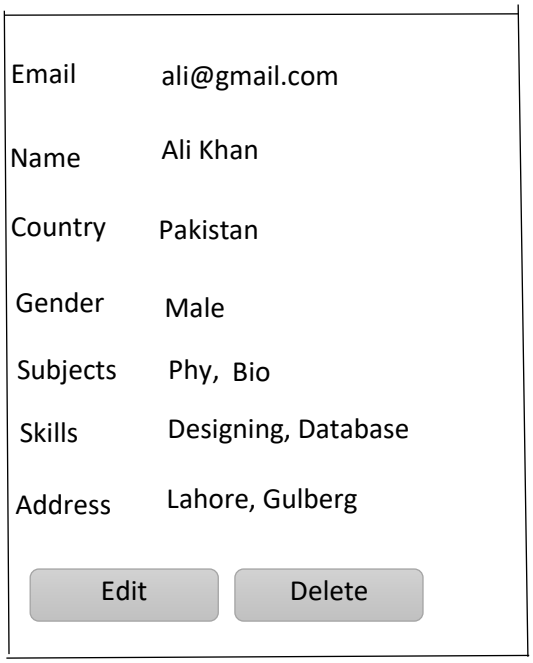
DISPLAY ALL DATA SCREEN

Use flat list or some other list to show the data of all persons, in the following format:

	Email	**Name**	**Country**
Select	ali@gmail.com	Ali Khan	Pakistan
Select	noman@gmail.com	Noman Ali	Afghanistan

When the user click on “select” against any record, the data is displayed in the following manner. (Pass the email to the next screen, where the record will be fetched from firestore against the email and showed in display screen).

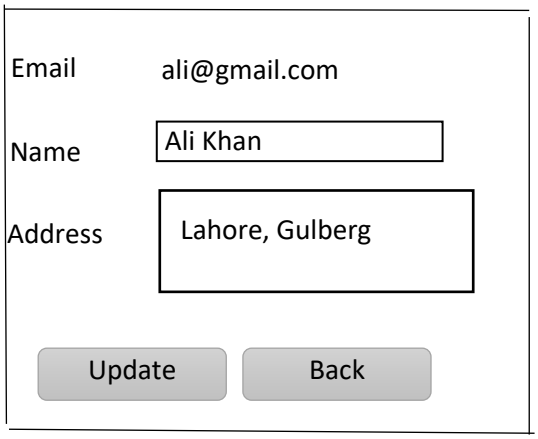
DISPLAY SINGLE DATA



When the user press delete button, the record should be deleted (after a confirmation alert) and the user should be directed back to the display all data screen.

When user presses on Edit button, the edit data screen should appear where his name and address should be in edit mode. (again, pass the email to edit screen and fetch record from db)

UPDATE DATA SCREEN



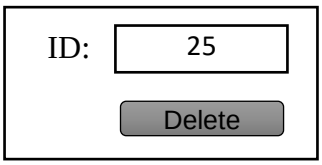
When user clicks on Update, the record is updated. When the user click on Back, he is directed back to the display single data screen.

SEARCH SCREEN.

When the user click on search button, the email is passed to the display single data screen, where the user's record is displayed.

Question C19

We have the following layout with a delete button.



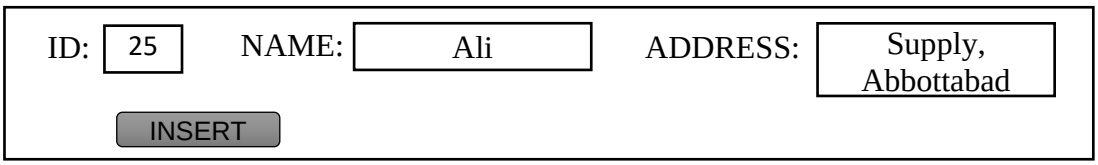
Write a method that deletes the document from firestore database whose id is 25.

Question C20:

Consider the following case study. An online shop has multiple products. Multiple customers are registered with the shop. Each customer can place multiple orders. Each order can contain multiple products purchased by the customer. The shop owner wants to maintain a complete history of what products in what quantities on what dates were purchased by which customers. Create a firestore schema to represent the above database (consisting of collections and/or subcollections).

Question C21:

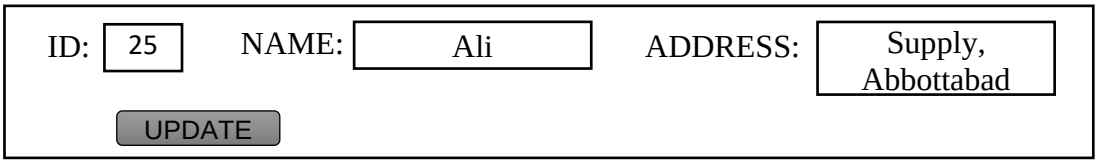
We have a following layout:



Write a method that inserts value in a firestore database collection “persons”.

Question C22:

We have a following layout:



Write a method that update value in database against ID = 25 using firestore

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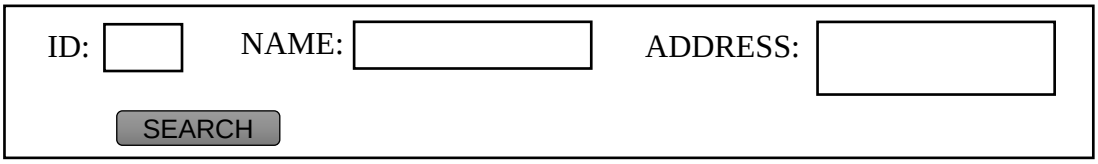
Question C23:

Suppose we have the following search form:



Based on the search fields in the above form, create a compound query to search record in a firestore collection “persons”.

Question C24:

You need to insert the following document in a collection name “students” in firestore database

Name: Ali Khan

Address:

{province: ‘punjab’, city: ‘lahore’}

1. Update the city of student from Lahore to Rawalpindi,

Solution:

Question C25:

You have a cities collection in firestore database. You need to select cities using compound query such that state of city is ABC, country is PQR, and population is greater than 1000.

You need to fetch record from 100th row and select the next 50 records.

Suppose you have a collection in a Firestore database storing the following values.

	ID	Name	CGPA
View	1	Javed	3.0
View	2	Noman	2.7

View	3	Ali	3.7

When a user clicks on View button against any record, the user should be navigated to a new screen showing the individual record of the user in console:

Question C26:

Suppose View button against ID=2 is clicked, the new screen should be showing:

ID: 2
Name: Noman
CGPA: 2.7

You need to:

(a) Write code to display the Flatlist

(b) Write code of the function component displaying individual user's values.

Question C27:

Consider the following case study. An online shop has multiple products. Multiple customers are registered with the shop. Each customer can place multiple orders. Each order can contain multiple products purchased by the customer. The shop owner wants to maintain a complete history of what products in what quantities on what dates were purchased by which customers. Create a firestore schema to represent the above database (consisting of collections and/or subcollections).

Question C28:

You need to create a web / mobile application using flutter and PHP. Here is the description of the application.

Customer:

A table to contain customers information that can purchase products from the website

Products:

A table of products

Order:

A table that contains orders for various products, the orders are placed by the customers.

Order Details:

A table that contains order id, product id as foreign keys and stores which products are ordered by a customer in a particular order.

You need to:

Develop a customer module where a customer can place various orders. The products should be maintained in a shopping cart. On checkout a textinput will be provided to enter a fake card info.

A seller module where he can add products and can see the orders placed by the customer. The seller should be able to complete the orders as we usually see in e-commerce applications.

FLUTTER ADVANCED TOPICS (CLO-5)

Question D3:

Take a picture from your mobile using camera SDK, and upload on Firestore database. Also store the name of the person whose picture is taken.

Question D4:

Create an app that shows the current GPS coordinates on the button click.

Question D5:

Create a GPS tracker app by attaching a listener, so that when the listener is running, the GPS coordinates are fetched after every few seconds automatically and stored in a file. To store values in a file using flutter, follow this URL:

https://docs.flutter.dev/cookbook/persistence/reading-writing-files