University of Bahrain
College of Information Technology
Department of Computer Science
First Semester, 2022-2023

ITCS444 Mobile Computing and Development
PRACTICAL FINAL EXAM

Date: 2nd January 2023   **Duration: 3 Hours**

STUDENT ID #	
STUDENT NAME	

QUESTION #	MARKS		COMMENTS
1	4		
2	17		
3	18		
4	11		
TOTAL	50		

Project Setup

Create an ionic project with **tabs** template and setup all necessary plugins and imports with firebase.

Note

It's your responsibility to save all your work and to submit a soft copy of your project *src* folder.
This Final Exam is open book exam and you may use or refer to any notes. Keep in mind that you may refer to provided notes or printed notes but you are not allowed to communicate with someone else. By this you testify that all submitted work in this exam is your own. This is a reminder note that any misconduct behavior will not be tolerated.

Question 1 [Marks 4]

In this Final Exam you have an app with **three tabs** and a service (**FB**):

- **Tab1:**   Tab1.html   ,   Tab1.ts
- **Tab2:**   Tab2.html   ,   Tab2.ts
- **Tab3:**   Tab3.html   ,   Tab3.ts
- **FB:**   FBService.ts

- Define a structure/interface called **User** with the following fields:
  - **Name**   (string)
  - **Shift**   (Array of Boolean)
  - **Quantity**   (number)
  - **Status**   (string)
  - **Approved**   (Boolean)

- You will need to create a firebase cloud firestore database and that allows you to create, add, delete and edit records of the above structure **User** in a collection name it **finalexam**. Therefore, ensure your project has the necessary plugins and imports.

- For your reference, Ionic Colors:
  - Blue: 'Primary'
  - Green: **'Success'**
  - Red: 'Danger'
  - Yellow: 'warning'
  - Black: 'dark'
  - Grey: **'Medium'**

Question 2   [Marks 17]

- In the **Tab1.html** page create a form that allows to submit information of type <u>User</u> in firebase as follows:

The Form expects the input of four fields.

1. First, the user inputs **User Name**
- Below the entered name, display a button titled '**Verify**'.
- In the toolbar at the top right display the icon ×
  (icon name is **close**).
- Perform Form validation using Form Builder and Form Group
  on <u>only the form **User Name**</u> and <u>validate</u> the following:
  name is required
  name consists of alphabets and letters.
  name has minimum length of 3.
  <div align="right">[Mark 4]</div>

- If the user input is not valid, the icon remains ×. Once, the
  input becomes valid it changes directly to ✓ (icon name is
  checkmark).
  <div align="right">[Mark 2]</div>

- If the user clicks the button **Verify**, it will check the validity of
  user input. If input is <u>valid</u>, the user **Status** will change to
  '**Pending**'. If input is invalid, the user **Status** will change to
  '**Error**'. Display the status to the left of button as shown in
  next figure.
  <div align="right">[Mark 2]</div>

2. Second, the user will then select the user **Shift** values. Display
   three checkboxes 'Morning', 'Afternoon' and 'Night' shifts as
   shown in figure.

3. Third, the user will determine **Quantity**. Display **up** and **down**
   arrows as icons (icon names are 'caret-down' and 'caret-up').
   Clicking the up icon/button increases the quantity by one.
   Clicking the down icon decreases quantity by one. Icons are
   better placed inside buttons for easier clicking.

4. Forth, display a toggle button to turn the field **Approved** on
   and off.

5. Finally display two buttons **Submit** and **Submit Anyway** side-by-
   side.
   <div align="right">[Mark 3]</div>

- Clicking the button '**Submit Anyway**' inserts the user data in the firebase without verification.

- The button '**Submit**' will be disabled if the field **Approved** is off. Enable the button if Approved is on.

- The button '**Submit**' inserts user data in firebase only if User **name** entered is valid. Display an alert message **only and only after** successful insertion otherwise display error message.

  In the alert controller message header display the inserted record **firebase id**.

6. Display '**Reset**' button in toolbar top left. The reset button will reset the values of variable User.

                                                        [Mark 6]

Question 3 [Marks 18]

- In the **Tab2.html** page allow the user to display the information as follows:

Display a <u>**list of items**</u> of all rows in the firestore database collection referenced. For each record display as shown with Formatting:

- ▪ **User name,**
- ▪ Checkbox with label '**detail**'.

The figure to the right is displaying three records (user1,user2,user3) stored in firebase. Order does not matter.
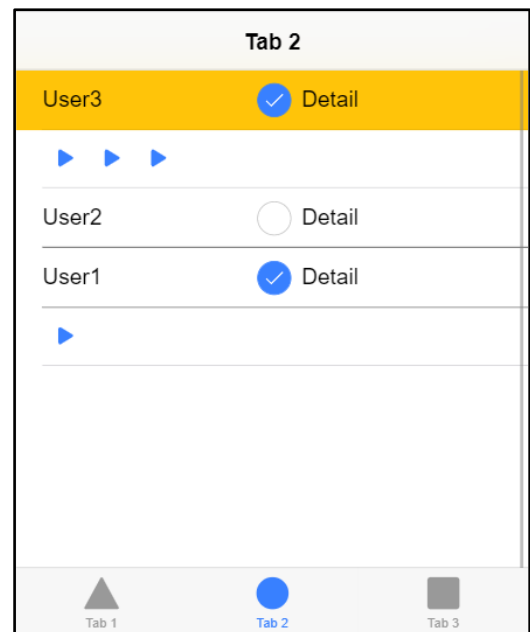[Mark 3]
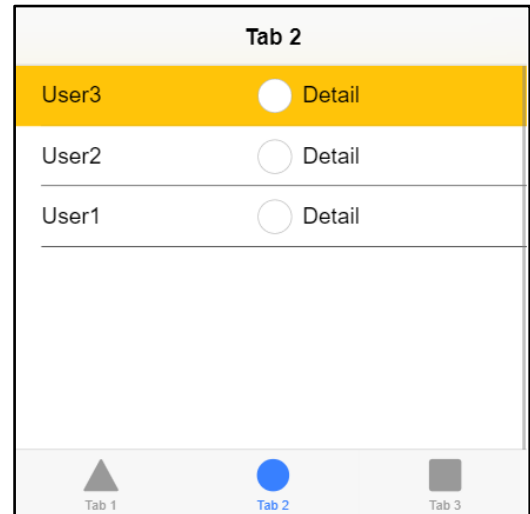
If you check the checkbox detail then show below the item the **Shift** value as <u>icons</u>. If you uncheck the checkbox, it hides the item with icons.
[Mark 3]

For example, if all shift values (morning, afternoon and night) are checked for user, then display 3 icons. If the only two values are checked the display 2 icons.

Icon name used is 'Play'.
[Mark 3]

- Clicking on any of the icons '**play**', will move(animate) the icon <u>to right</u> as follows:

    - translateY: 0
    - translateX: 100px.
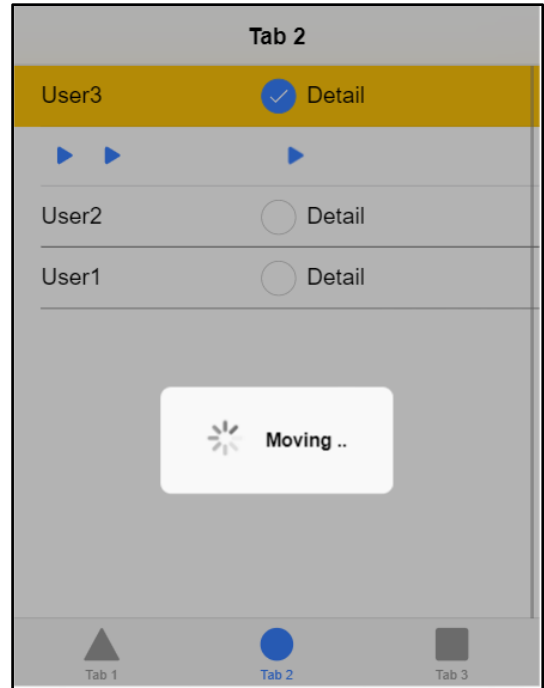   - type: dynamics.linear
    - duration: 1500

                                                    [Mark 4]

- Before the animation starts show a **loading controller** with message 'moving'. Close the loading controller message <u>**only and only after**</u> the animation is complete.
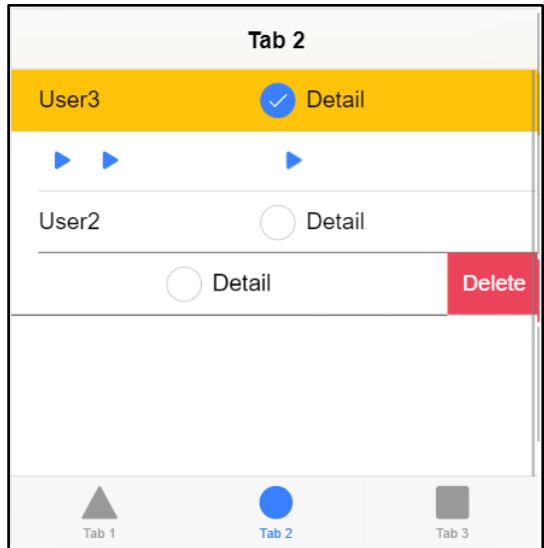   [Mark 3]

- Place the icons within buttons for easier clicking.

- Swipe the ion-item to the left, to display a delete button. Clicking the delete button will delete the record.
                                                    [Mark 2]

Question 4   [Marks 11]

In the **Tab3.html** page create the following:

- Display four boxes with letters: **H,O,M,E**.
  You may use HTML tag <div> with CSS class. Set the width and height to 25%.
- Display another box below them with white background color. You may use tag <div> with CSS class. Set the width to 100% and height to approx. 300px.
- Display button titled '**Verify**'.
- Create an array **List1** with four values: [`'H'`,`'O'`,`'M'`,`'E'`]
- Create an array **List2** empty.
- The four boxes are draggable.
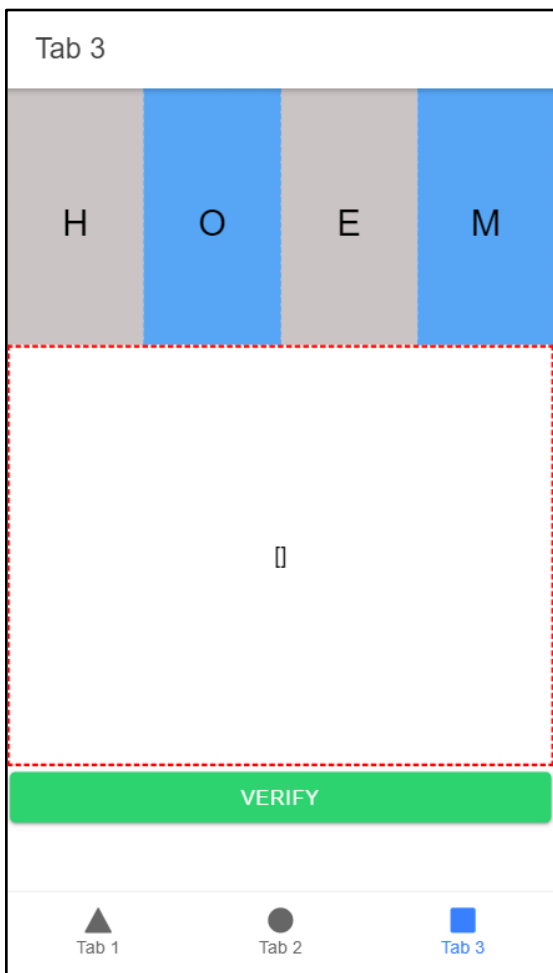
<div align="right">[Mark 4]</div>
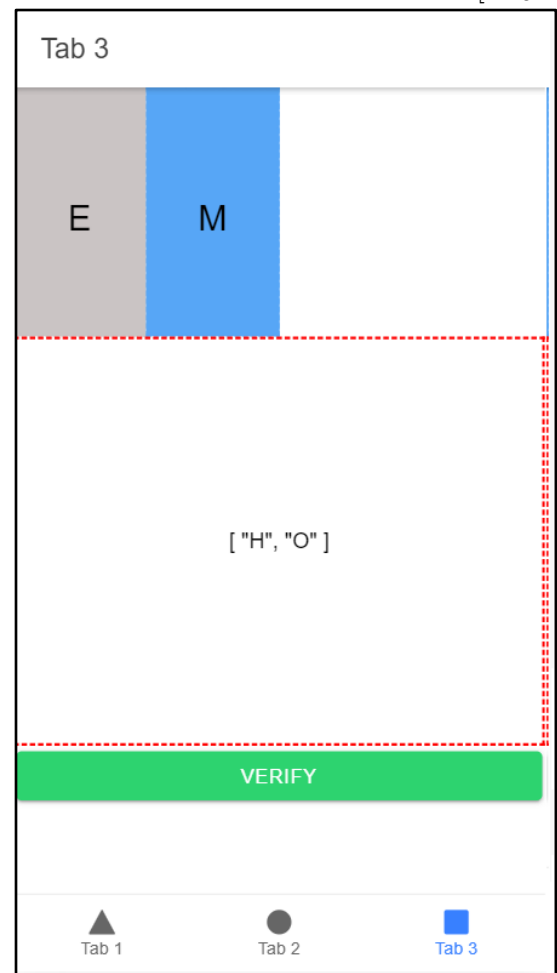

Figure: tab3 start

Figure: Two boxes H and O are dragged.

- The user should be able to **drag** any of the colored four boxes. If the box enters the white box (or you may check if currentY is above for example 300) then the box should be removed and its value is inserted in **List2 array**. Display **List2 array** values inside the white box.

  `[ Mark 4]`

- When the user clicks the '**Verify**' button. Then display an alert message as follows:
  - If the values inside the white box (List2) construct the word 'Home', display the message '**Correct**'; otherwise display the message '**Incorrect**'.

  `[ Mark 3]`
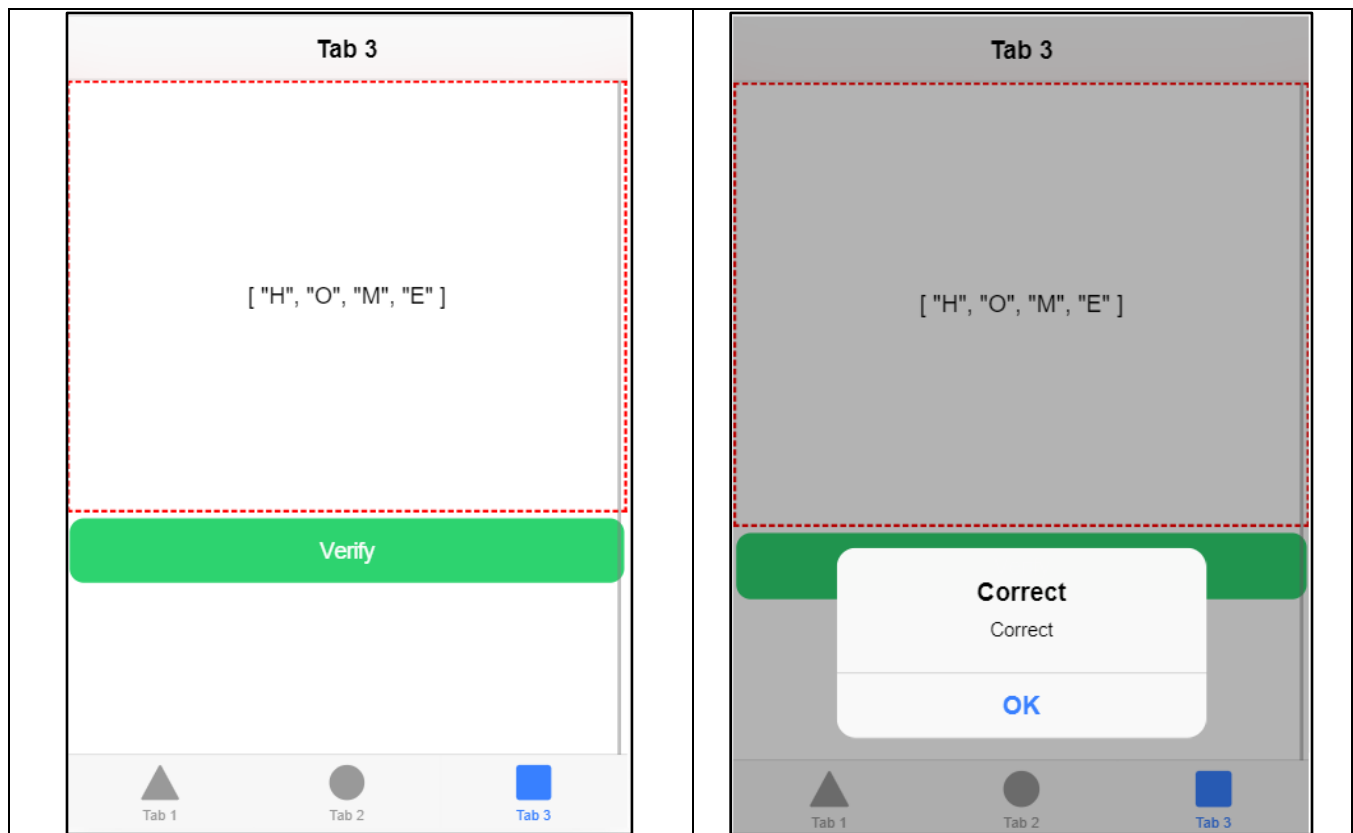
Submission

1. Submit with at least <u>three records</u> in database.

2. Take a **snapshot** of your firebase database and save as "database.jpg" that shows the content of your database.

3. Compress your *src* <u>folder</u> with **database.jpg** and rename as *src XXXX*, where XXXX is your student ID.

4. Upload compressed file on blackboard   (contains **src** folder and **database**.jpg).