Test Project

Module D - Development and Testing

Mobile Applications Development

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Introduction

To enhance visitors' understanding of China's five-thousand-year history and culture, and to improve the visitor service experience during the 48th WorldSkills Competition, an app named HeritagePass Shanghai is planned for development. The application will focus on functions such as registration, admission tickets, venue filtering, and project browsing, helping visitors participate in the event conveniently while experiencing the unique charm of Chinese culture integrated with the skills competition.

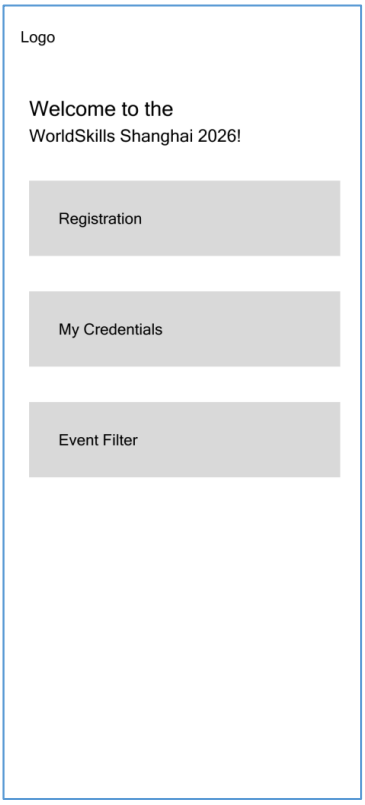
All requirement stories, images, and other materials in this Test Project are fictional, for competition use only, and have no real-world counterpart.

Description of project and tasks

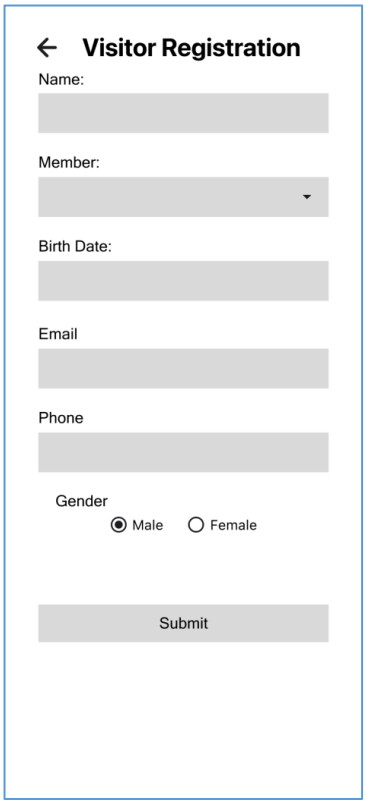
You do not need to consider the program interface's aesthetics and the elements' position. The work can be inconsistent with the given wireframes, but you need to consider the ease of use. The development task is divided into one part depending on the devices:

	PART	NAME	COMPETITION TIME	MARKING DEVICES
√	D	Development and Testing	3h	Emulator: Pixel 2 or iPhone 14

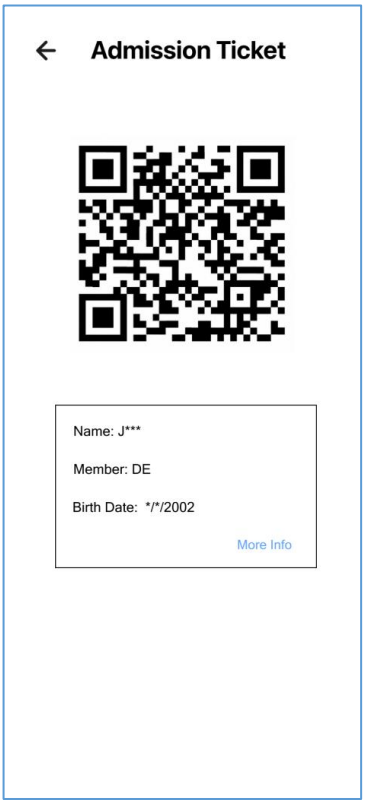
Below is an overview of the wireframes. Please check the media-files for details.



Welcome Page

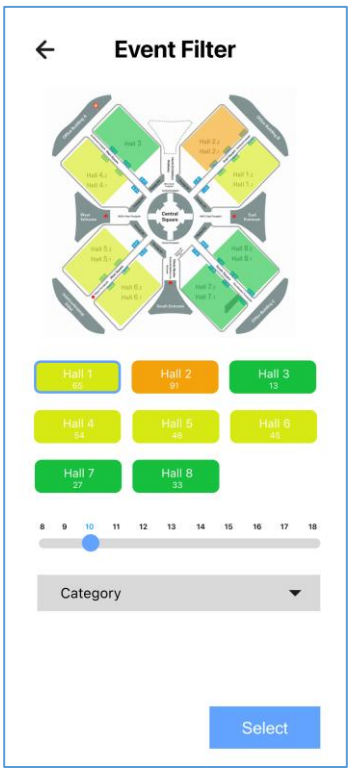


Registration Page

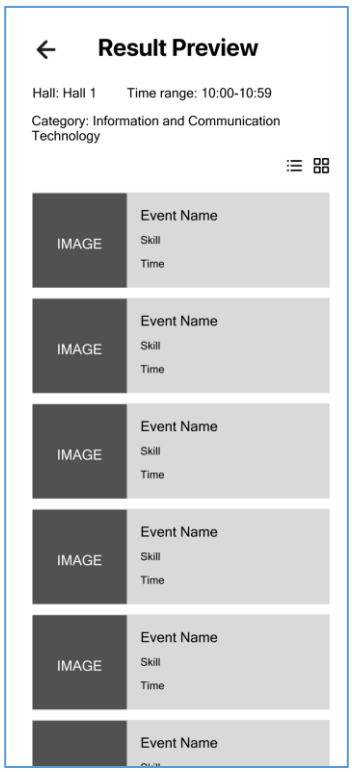


Admission Page

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Filtering Page



Results Page



Event Details Page

General Demands

1. Implement all required application functionalities according to the requirements;
2. Write automated test cases according to the requirements of the question.

Pages Demands

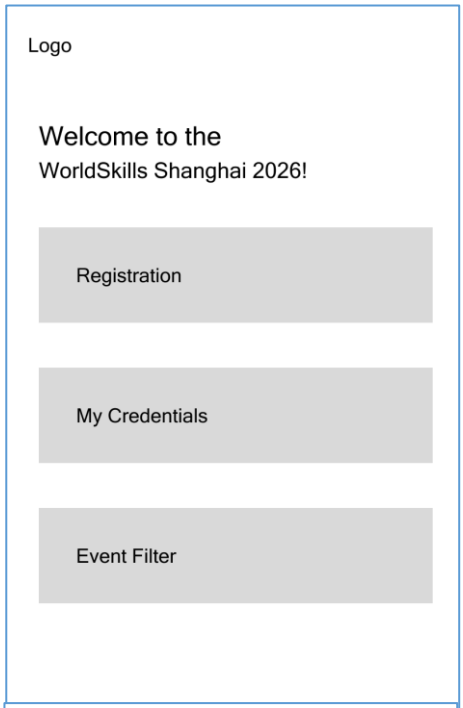
1. Welcome Page

Elements include

1. Application logo
2. Text "Welcome to the WorldSkills Shanghai 2026!"
3. "Registration" button
4. "My Credentials" button
5. "Event Filter" button

Functional requirements

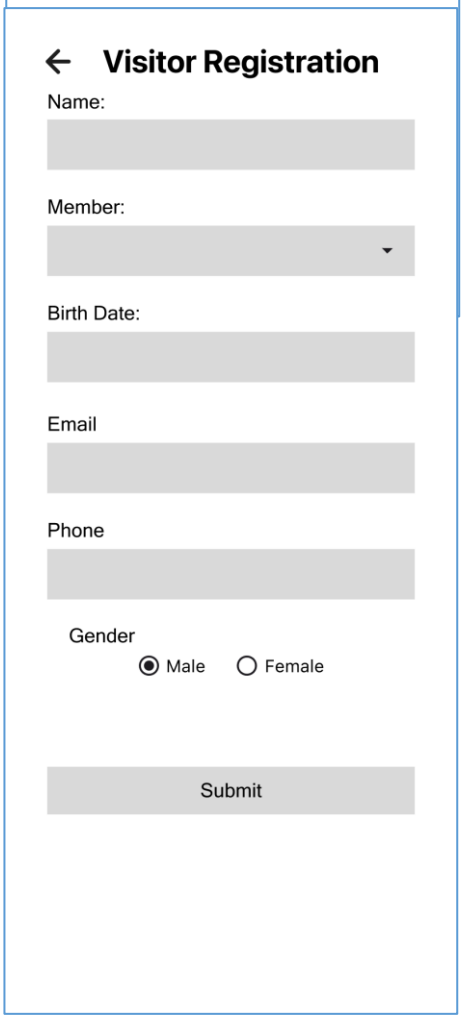
1. Replace the logo in the top-left corner with the official WorldSkills logo;
2. Tap the Registration button to navigate to the **Registration Page**;
3. Tap the My Credentials button to navigate to the **Admission Page**;
4. Tap the Event Filter button to navigate to the **Filtering Page**.



2. Registration Page

Elements include

1. Title "Visitor Registration"
2. Back icon button
3. Form:
   (a) Name input field
   (b) Member dropdown selector
   (c) Birth Date input field
   (d) Email input field
   (e) Phone input field
   (f) Gender selection with radio buttons for Male and Female
4. "Submit" button



Functional requirements

1. Tap Back icon button to return to the **Welcome Page**;
2. The form validation should meet the following requirements:
   (a) Name field length should be greater than 4 characters;
   (b) When the Member dropdown selector is tapped, all member information should be correctly listed based on the provided data file: *data/members.json* ;
   (c) Birth Date input must follow the format MM/dd/yyyy(e.g. 06/15/2002);
   (d) Email field must match the standard email format (e.g. test@example.com);
   (e) Phone field should contain at least 5 digits excluding the country code. After the Member is selected, the input field

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should automatically be prefixed with the country code, The country code must remain fixed and cannot be deleted or modified through user input;

(f) Gender selection is required;

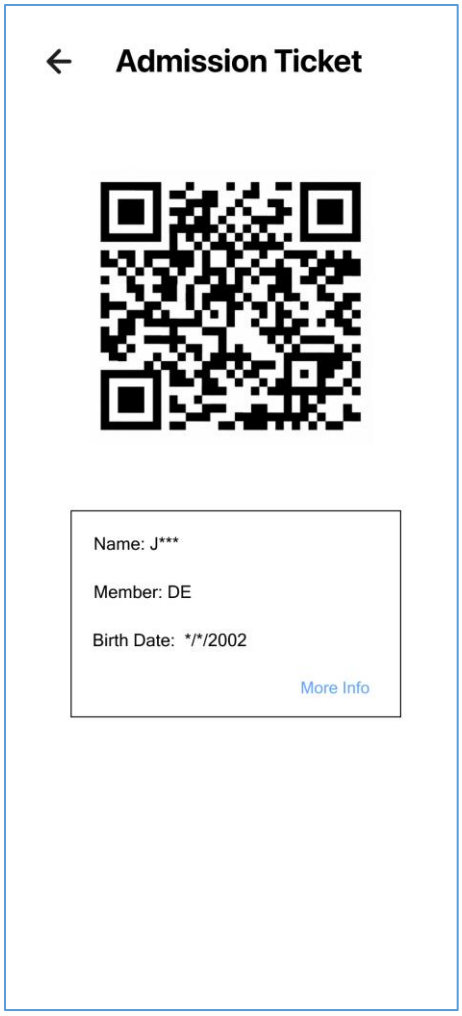
3. When Submit button is tapped:

   (a) If the form is incomplete or does not meet the validation requirements, a dialog should be displayed:

      (i) Display the text "Incomplete Information"
      (ii) Display a Confirm button. When tapped, the dialog should be closed and the form should not be submitted;

   (b) user record should be created and then the application should navigate to the **Admission Page.**

3. Admission Page



Elements include

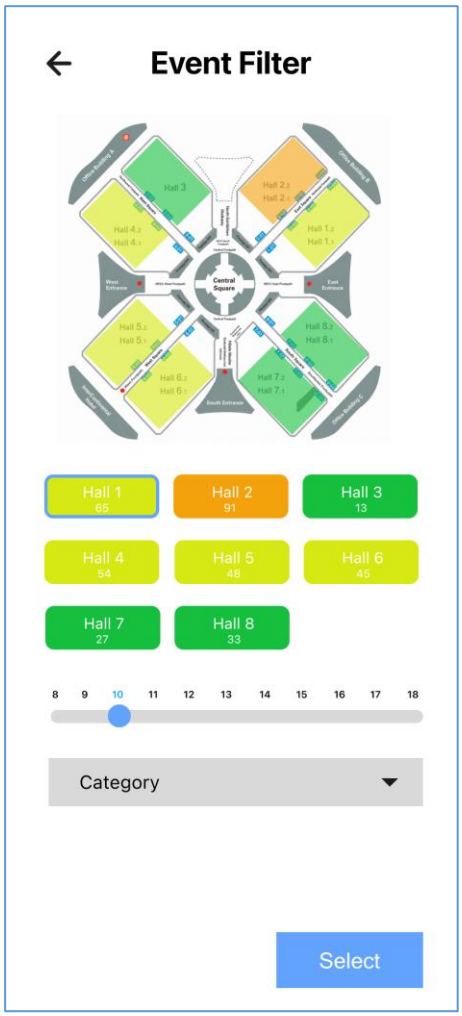
1. Title "Admission Ticket"
2. Back icon button
3. QR code image
4. Personal information card
5. "More Info" button

Functional requirements

1. When Back icon button is tapped, return to the **Welcome Page**;
2. Personal information card displays the latest registration information;
3. By default, personal information card displays only the Name, Member, and Birth Date;
4. When More Info button is tapped, the full registration information of the current user should be displayed, including Name, Member, Birth Date, Email, Phone, and Gender;
5. Sensitive information on the personal information card should be masked according to the masking rules specified in the **Desensitization rules**.

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4. Filtering Page



Elements include

1. Title "Event Filter"
2. Back icon button
3. Venue image
4. Hall list:

   (a) Hall name
   (b) Live Attendance

5. Time range slider
6. Category selector
7. "Select" button

Functional requirements

1. When Back icon button is tapped, return to the **Welcome Page**;
2. By parsing the provided data (*data/skill_venue_mapping.json*), generate and display the hall list correctly. For example, if data contains Hall 1.1 and Hall 1.2, only display "Hall 1". The same rule applies to other venues;
3. The time slider should display a range from 8 to 18 and support selection in 1-hour increments. For example, selecting 10 represents the time period from 10:00 to 10:59;
4. Live Attendance in each venue should be calculated based on the currently selected time range. User activity records should be parsed from *data/user_activity_records.json* to accurately compute the live attendance for each venue within the selected time period

```
{
    "time": "2026-09-23 08:31",
    "userId": 2635,
    "operation": "enter",
    "skillId": 54
},
{
    "time": "2026-09-23 08:32",
    "userId": 103,
    "operation": "exit",
    "skillId": 9
},
```

sample data of *data/user_activity_records.json*

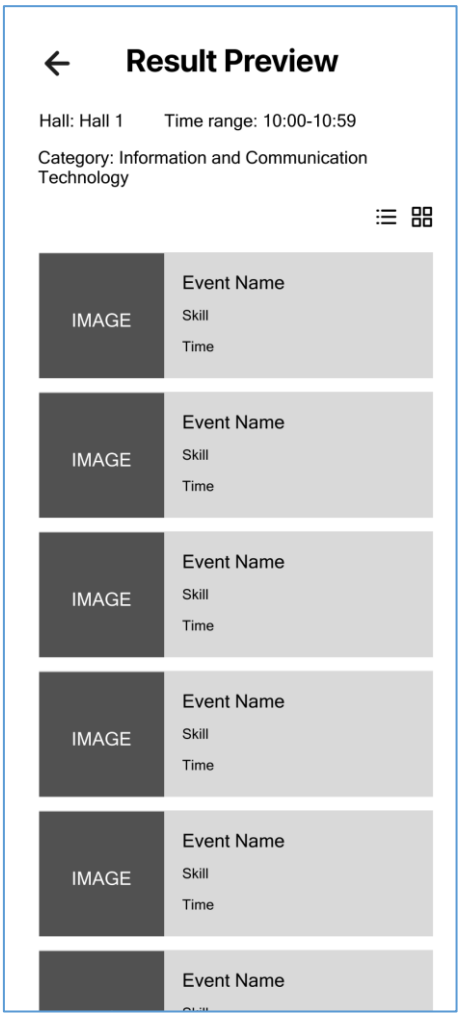
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* **Color Rules** for calculating the number of spectators in the venue:

(a) In the user activity records, the "enter" field indicates that a user enters a specific item, and the "exit" field indicates that a user leaves a specific item;
(b) You should correctly determine the hall to which the user belongs based on the entered item;
(c) The live attendance represents the number of users currently staying in the hall within the selected time range;
(d) If a user entered an item before the selected time range and has not exited during the selected time range, the user should still be counted in the corresponding hall;
(e) Users within the same hall should be aggregated. For example, visitors in Hall 1.1 and Hall 1.2 should both be counted under Hall 1;
(f) *If a user's exit time is earlier than or equal to the selected time range, the user should not be counted in the corresponding hall;*

5. Each hall list item should be displayed in different colors based on the current live attendance:
   (a) When the number is [0, 40], the color should be green;
   (b) When the number is (40, 75], the color should be yellow;
   (c) When the number is (75, 105], the color should be orange;
   (d) When the number exceeds 105, the color should be red;
6. The corresponding hall area in the venue image should also be filled with the same color based on the **Color Rules**;
7. When a hall list item is tapped, it should be highlighted to indicate the selected state;
8. The category selector has six options, and the option data is sourced from (*data/skill_venue_mapping.json*);
9. When Select button is tapped, navigate to the **Results Page**.

5. Results Page



Elements include

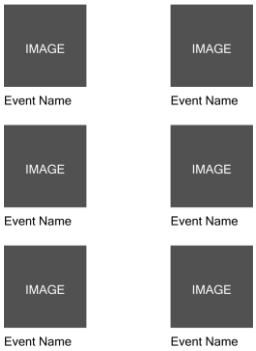
1. Title "Result Preview"
2. Back icon button
3. Hall, Time range and Category text
4. List view icon button
5. Grid view icon button
6. In the event list area under List View mode, each item is displayed in a single-column layout with the following elements:

   (a) Event image
   (b) Event name
   (c) Skill name
   (d) Time

7. In the event list area under Grid View mode, each item is displayed in a two-column layout with the following elements:

   (a) Event image
   (b) Event name

Event Grid View mode



Functional requirements

1. When back icon button is tapped, return to the **Welcome Page**;
2. Based on the selections made on the **Filtering Page**, display the hall, time range, and category text correctly;
3. Based on the selected hall, time range, and category from the **Filtering Page**, filter the event data from the provided file (*data/events.json*) and display the matching events in the list correctly;
4. The event list should be sorted by time in descending order;
5. When the List View icon button is tapped, display the event list in List View mode;
6. When the Grid View icon button is tapped, display the event list in Grid View mode;
7. When switching between views, the first event visible in the current scroll position should remain within the visible area in the new view;
8. Display the event list in List View mode by default;
9. When an Event list item is tapped, navigate to the **Event Details Page**.

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6. Event Details Page



Elements include

1. Back icon button
2. Event details area:

   (a) Event Name
   (b) Skill name
   (c) Time
   (d) Event Image
   (e) Event Description

Functional requirements

1. When Back icon button is tapped, return to the **Results Page**;
2. Event details area:

   (a) Detail information comes from the event selected on the previous Page;
   (b) When the image is tapped, it should be displayed in full-screen mode. In full-screen mode, pinch-to-zoom should be supported. Tapping the image again should exit full-screen mode.

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Automated testing

Complete the automated test scripts according to the Test Project requirements. Please note that the test script files must be stored in the specified location in accordance with the Automated Testing Guidelines.

Each test step shall be maintained for at least 5 seconds. For every step, a log message in the format should be output to the console or debug console as follows:

"Step No: <Step Number>, <Action Description>"

TABLE 1.1: AUTOMATED FUNCTIONAL TEST CASES FOR THE APPLICATION				
Program Name		HeritagePass Shanghai		
Test type		Functional testing		
Test methods		Black-box testing, automated testing		
Test requirements		Application functions and workflow are running normally		
Test execution steps				
Step number	Page	Action description	Input data	Expected results
1		Launch the HeritagePass Shanghai App		Launch HeritagePass Shanghai App and display Welcome Page
2	Welcome Page	Tap the "Registration" button		navigate to the Registration Page
3	Registration Page	Enter Name	David	Name field displays "David"
4	Registration Page	Tap the Member dropdown selector	Select "China"	Member field displays "China", Phone field is automatically populated with the country code "+86"
5	Registration Page	Enter Birth Date	04/15/2003	Birth Date field displays "04/15/2003"
6	Registration Page	Enter Email	test@example	Email field displays "test@example"

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TABLE 1.1: AUTOMATED FUNCTIONAL TEST CASES FOR THE APPLICATION				
7	Registration Page	Tap Submit button		A validation failure dialog appears
8	Registration Page	Tap Confirm button		Dismiss the dialog
9	Registration Page	Enter Email	test@example.com	Email field displays "test@example.com"
10	Registration Page	Enter Phone	17012345678	Phone field displays "+8617012345678"
11	Registration Page	Select the "Female" option in the Gender field		"Female" option is selected
12	Registration Page	Tap Submit button		navigate to the Admission Page
13	Admission Page	Tap More Info button		Display the current user registration information, and mask sensitive data according to the masking rules
14	Admission Page	Tap back icon button		return to the Welcome Page
15	Welcome Page	Tap Event Filter button		navigate to the Filtering Page
16	Filtering Page	Tap Hall 1		"Hall 1" option is selected
17	Filtering Page	Drag the time range slider to 13		Time range slider is set to 13. The hall list is updated to correctly reflect live attendance and corresponding color states

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TABLE 1.1: AUTOMATED FUNCTIONAL TEST CASES FOR THE APPLICATION				
18	Filtering Page	Tap the Category selector	Select "Manufacturing and Engineering Technology"	Category field displays "Manufacturing and Engineering Technology"
19	Filtering Page	Tap Select button		navigate to the Results Page
20	Results Page	Scroll to the 23rd list item. Tap the Grid View icon button to switch to Grid View mode		The first item in the scrollable area remains visible within the Grid View viewport
21	Results Page	Tap the 23rd list item		navigate to the Event Details Page
22	Event Details Page	Tap the event image		Display the event image in full-screen mode
23	Event Details Page	Perform a pinch-out gesture on the image		Zoom in on the event image

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TABLE 1.1: AUTOMATED FUNCTIONAL TEST CASES FOR THE APPLICATION				
24	Event Details Page	Perform a pinch-in gesture on the image		Zoom out on the event image
25	Event Details Page	Tap the event image		Exit full-screen mode

Instructions to the Competitor

1. Please create the project with correct package name (Android)/ Organization Identifier (iOS). Naming convention: edu.ws2026.mdXX;
2. You should save the project in the folder: XX_MD;
3. You should rename the generated apk (Android)/ app (iOS) file as XX_MD.apk (Android)/ XX_MD.app (iOS), and save it in the root of the XX_MD folder;
4. The whole XX_MD folder should be pushed to the provided remote Git repository in time;
5. Note: "XX" is your workstation code.

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Automated Test Guide

Automated test dependencies configuration guide and scripts storage demands:

- If you use native Android platform, you should use "UI Automator" to finish the automated test scripts. You must write your UI test scripts entrance method "startTesting" in ApplicationUITesting class in androidTest directory. You must make sure that UI test in Android Studio can be started by clicking the start run button of the method: "startTesting"

> Before building your UI test with UI Automator, make sure to configure your test source code location and project dependencies. In the build.gradle file of your Android app module, you must set a dependency reference to the UI Automator library:
>
> ```
> dependencies {
>    ...
>    androidTestImplementation 'androidx.test.uiautomator:uiautomator:2.2.0'
> }
> ```

- If you use Flutter platforms, you should use 'flutter_test' and 'integration_test' packages to finish the automated test scripts. You must write your UI test scripts in integration_test/app_test.dart file. You must make sure that the UI test can be started by running the console command:

    1. "flutter pub get --offline"
    2. "flutter test --no-pub integration_test/app_test.dart"

> Before building your UI test with flutter_test and integration_test packages, make sure to configure your project dependencies. In the pubspec.yaml file of your flutter module, you must set dependencies reference to the flutter_test and integration_test packages:
> ```
> dev_dependencies:
>   flutter_test:
>     sdk: flutter
>   integration_test:
>     sdk: flutter
> ```

- If you use native iOS platforms, you should finish the automated test scripts. During the marking process, the Experts will mark your UI test with the Xcode. You must make sure that the UI test in Xcode can be started by clicking the start run button of the method: "testStart" in "[Project Name]UITests.swift" or "[Project Name]UITests.m".

> When you create a project, select the Include Unit Tests and Include UI Tests checkboxes that appear under the Language pop-up menu on the first sheet. These options preconfigure your project with [Project Name]Tests and [Project Name]UITests targets. In the Test navigator, you can view and edit the code for these tests, and add additional tests. Then run the UI tests and unit tests on simulated and connected devices.

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Desensitization rules

ID	RULE	DESCRIPTION
1	Name	English names: only the first letter of each part is shown John Doe → J*** D**
2	Email	Only display the first and last character, while the domain remains unchanged john.doe@example.com → j*******e@example.com test123@xxx.com → t*****3@xxx.com
3	Date of Birth	Weak masking for display purposes 03/15/1999 → */*/1999

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