Mobile Application Development 2022-23

A playing court reservation application

Lab2 – Show and edit user profile

Learning objectives

- Using GitHub to share the project code within the group
- Designing early UX layers
- Designing basic UIs: layouts, colors, icons, menus, responsiveness
- Managing the activity life cycle
- Using intents to exchange data between activities
- Loading, scaling, and rotating pictures
- Persisting data in the file system

Description

Practicing team sports requires finding enough friends available for playing one or more matches: in today's frenetic life, this may be a challenge. So, one of the side capabilities offered by a court reservation application is a way to search for others interested in playing in the time slots you have reserved.
In order to find a better match, users must advertise their own interests and skills, and creating and browsing user profiles represents a major section of the app.

First of all you should define who your users are: their characteristics, objectives, needs, capabilities and limits. This will guide you in defining a set of information you need to manage, as well as a way to present them. When the UX basics have been defined, you can start with the implementation.

You will create an activity that allows a user to display its own profile, and another by which the profile can be edited. The profile contains a picture and the identified set of data. When the app starts, it is in “view mode”, and it shows the current profile data. If no data is present, it will show some default content. A command available in the user interface will allow the user to switch to the "edit mode". This has a similar layout as the previous one, but all fields are now editable. Moreover, touching the picture will trigger the camera app that allows the user to snap a new picture and

return it to the app. Alternatively, the user can select the picture from the phone gallery. By pressing the back button when in “edit mode” all changes are persisted, the profile returns in “view mode” and all fields reflect the updated values.
The project will be kept on GitHub as a private repository.

Steps

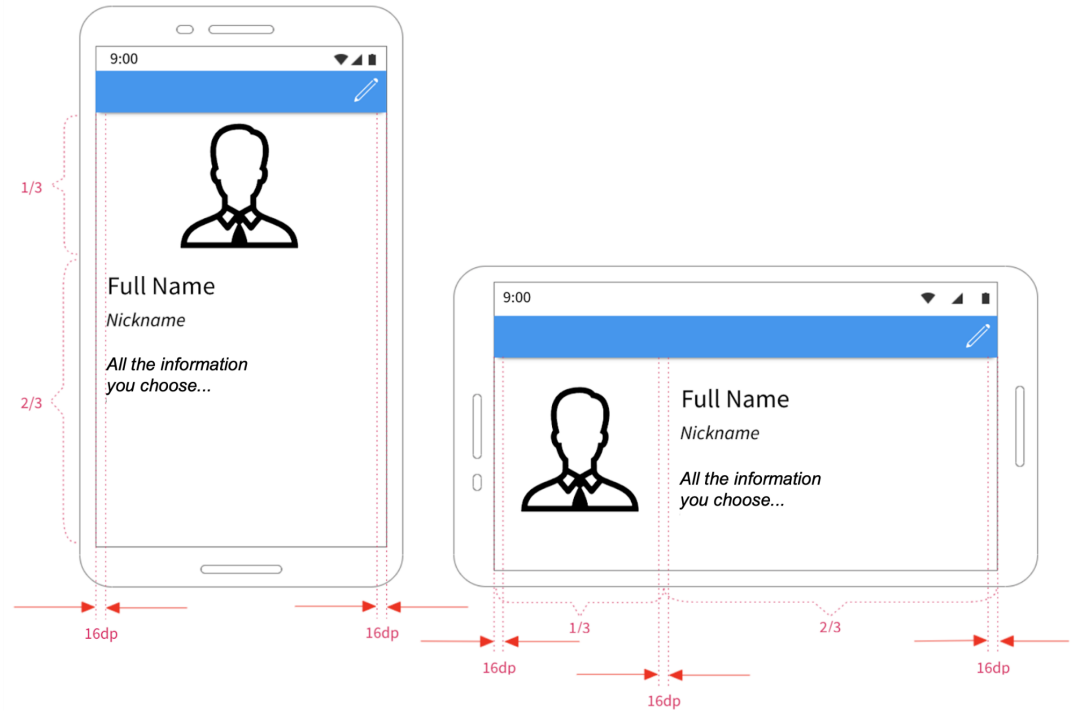
1. Thinking of the users and of the purpose of the application, identify what information need to be collected and displayed in the user profile
    a. How are they going to be represented?
    b. Is some information more relevant than others?
    c. Are there any dependencies?
2. Create an account on GitHub for each group member (if you do not have one, yet).
    a. Ask a single team member to create a new Android Studio project using the Empty activity template, choosing Kotlin as programming language
    b. Name the activity ShowProfileActivity. Make sure the “Generate Layout file” option is checked
    c. Select menu VCS → Share Project on GitHub and select the private option: this will create a new repository in the GitHub account
    d. Add all other group mates to the repository, granting them write privileges.
    e. Now other members can clone the project and cooperate: have care to manage push operations, not to overwrite existing code. Consider using a well known methodology like Git Flow (https://infinum.com/handbook/android/building-quality-apps/using-git)
3. Customize the ShowProfileActivity
    a. The purpose of this activity is to show a basic set of data about a user. This should comprise, at least, the following items:
        i. Photo (possibly a default image stored as a drawable resource)
        ii. Full Name (your real name)

iii. Nickname (your chosen public identity)

iv. Any relevant information that was identified in the first step

b. Each piece of information should be maintained as a property of the activity and initialized with some static value (to be replaced later on)

c. Modify the basic layout as sketched in the following picture (remember that the colored app bar is generated programmatically, and it is not part of the layout file)



d. The app must be responsive to different screen sizes and different orientations: check that everything works as expected choosing different device presets, both in landscape and in portrait mode

e. Commit project. Push it on the remote repository

4. Following the guidelines in the menu Android guide (https://developer.android.com/guide/topics/ui/menus), create a menu resource file containing a single item, having a pencil icon, setting the “showAsAction” attribute to “always”

a. In the activity kotlin file, override method onCreateOptionsMenu(...) and inflate the created menu. Try launching the app and verify that the icon properly shows in the right part of the app bar

    b. Override method onOptionsItemSelected(...) and add a simple reaction to the selection of the pencil item
    c. Launch your app and verify that everything works as expected
    d. Commit project. Push it on the remote repository
5. Create a second activity named EditProfileActivity that allows the user to edit his personal data
    a. The layout file will mimic the previous one with some exceptions: all *TextView*s will be replaced by corresponding *EditText*s, having their *inputType* attribute duly set to a suitable type of content, in order to support the data entry process; the ImageView will show an *ImageButton* on top of it, labeled with a camera icon
    b. If the user clicks on the *ImageButton* a floating context menu appears, showing the following options:
        i. Select an image from the phone gallery
        ii. Use the camera to take a picture
    c. The input fields must implement a smart keyboard
        i. Customizing the displayed keys to the data item to be entered (generic text, e-mail address, numbers, …)
    d. If the user rotates the device, data entered so long should not be lost
    e. Commit project. Push it to the remote repository.
6. Connect the two activities so that you can switch from the "view mode" to the "edit mode", making any change permanent.
    a. Run the application and check that everything works as expected
    b. Commit project. Push it to the remote repository.
7. Update *EditProfileActivity* to allow the user to choose a different picture
    a. Carefully read the document https://hamzaasif-mobileml.medium.com/android-capturing-images-from-camera-or-gallery-as-bitmaps-using-activityresultlauncher-ad59d3a075e1, and use the contained guidelines to allow the user to launch the default camera application in order to snap a new picture and to return it to the application or to select an existing image from the gallery

    b. Commit project. Push it on the remote repository

8. Persist all the information in the local file system, so that, when the app is started again, all edited content is retrieved

    a. Using the background information contained in the document https://developer.android.com/training/data-storage/shared-preference update the *ShowProfileActivity* in order to load, on startup, the profile data from *SharedPreferences* and to persist updated information whenever the *EditProfileActivity* returns updated data. The data must be serialized and deserialized using a *JSONObject* and the resulting String must be saved with the key *profile*.

    b. The user profile image must be saved to the local filesystem, following the guidelines contained in the document https://developer.android.com/training/data-storage/app-specific.

    c. Commit project. Push it on the remote repository

Summary

Activities

- An Activity is an app component that provides a single screen focused on a single user task.
- Each Activity has its own user interface layout file.
- You can assign your Activity implementations a parent/child relationship to enable Up navigation within your app.
- Activities may have an option menu which is located in the left side of the toolbar

Intents

- An Intent lets you request an action from another component in your app, for example, to start one Activity from another. An Intent can be explicit or implicit.
- With an explicit Intent you indicate the specific target component to receive the data.

- With an implicit `Intent` you specify the functionality you want but not the target component.
- An `Intent` can include data on which to perform an action (as a URI) or additional information as `Intent` *extras*.
- `Intent` *extras* are key/value pairs in a `Bundle` that are sent along with the `Intent`.

SharedPreferences

- The `SharedPreferences` class allows an app to store small amounts of primitive data as key-value pairs.
- Shared preferences persist across different user sessions of the same app.
- To write to the shared preferences, get a `SharedPreferences.Editor` object.
- Use the various "put" methods in a `SharedPreferences.Editor` object, such as `putInt()` or `putString()`, to put data into the shared preferences with a key and a value.
- Use the various "get" methods in a `SharedPreferences` object, such as `getInt()` or `getString()`, to get data out of the shared preferences with a key.
- Use the `clear()` method in a `SharedPreferences.Editor` object to remove all the data stored in the preferences.
- Use the `apply()` method in a `SharedPreferences.Editor` object to save the changes to the preferences file.

Paper Prototyping

- Even if Android Studio gives you very good tools for designing your app's UI, it's always important to start from a paper sketch
- Try to make a simple sketch of all the activities you're planning to design for your application, taking note of all the expected elements of the UI, for each requested feature
- Having a design/brainstorming phase with all the application's screens on a global paper scheme, will help you A LOT in the following phases, to avoid

user experience problems - which always translate in unwanted redesigning/re-coding for your activities

Submission rules

- The work must be submitted by next lab
- The functionalities implemented in the code as well as the design of the user interface will be evaluated
- Before submitting, clean the project using *Build -> Clean Project*
- Create a zip file with your project and name it gXX_lab2.zip
- Upload it on the Polito web portal (only one student of the group must upload it); in case of multiple uploads by the same group, only the most recent one will be evaluated