Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Specialized in Information Technology

Final Examination

Year 2, Semester 2 (2023)

IT2010 – Mobile Application Development

Duration: 2 Hours

May/June 2023

Version 01

Instructions to Candidates:

♦ This paper has 4 questions.
♦ The total mark for the paper is 100%.
♦ This paper contains 7 pages, including the cover page.
♦ Mobile Phones are not allowed during the exam.
♦ Students cannot browse the internet during the exam.
♦ 10 minutes reading time is allowed
♦ All questions must be answered within the cages provided in the Netexam.
♦ Reference materials can be found in the Netexam Quiz

Question 01

a) List 3 reasons why Kotlin is suitable for Android Application development.

(3 Marks)

b) Explain the following terms that are associated with Kotlin programming language.

(2 Marks)

1. Type Inference
2. Null Safety

c) List 3 types of Mobile Application Development

(3 Marks)

d) Explain the usage of broadcast receivers in android applications with examples.

(4 Marks)

e) List the types of Android services and describe its functionality

(3 Marks)

Question 02

(15 marks)

Following code snippets have been extracted from the Android Services Tutorial (Tutorial 07). Complete sheet is uploaded to the netexam server as well.

a) Explain the scenarios where an exception can occur in the following code.

(5 marks)

```
private fun playTrack(trackIndex: Int) {
    val uri = Uri.parse("android.resource://$packageName/${trackList[trackIndex]}")
    nowPlaying = "Now Playing: Track: Track ${trackIndex + 1}"
    if (isPaused) {
      mediaPlayer.start()
      isPaused = false
    } else {
      try {
        mediaPlayer.reset()
        mediaPlayer = MediaPlayer.create(this, uri)
        mediaPlayer.setOnPreparedListener(this)
      } catch (e: IOException) {
        e.printStackTrace()
      }
    }
}
```

b) Explain the need for calling the mediaplayer.release() method in the following code

(4 marks)

```
fun stopTrack() {
    mediaPlayer.stop()
    mediaPlayer.release()
    mediaPlayer = MediaPlayer()
}
```

c) Explain what will happen if you comment the unbindService(serviceConnection) from the following code.

(3 Marks)

```
override fun onStop() {
    super.onStop()
    if (isBound) {
        unbindService(serviceConnection)
        isBound = false
    }
}
```

d) Explain the usage of the LocalBinder class

(3 Marks)

```
inner class LocalBinder : Binder() {
    fun getService(): MusicPlayerService = this@MusicPlayerService
}
```

Question 03 (30 marks)

A coffee shop introduces a new online ordering system that allows customers to place their orders through an android app. Customers can create an account, select their drink, customize it to their preferences, and pay for their order through the app.

Following are the application features belonging to the user type

Admin

- Can add, edit, and delete drinks
- See customer feedback
- Reply to customers
- View purchase history

Customer

- Create an account
- Select a drink
- Customize the drink
- Pay for the drink
- Add/ edit feedback

a) Construct 2 entity data classes that are related to the above scenario.

(10 Marks)

b) Design all the activities for the mentioned app using the listed views below. Note that you can write down the activity name and list the views. List them according to how they appear on the screen top to bottom as shown in example1?

(10 Marks)

Views
TextView
EditText
Button
RadioGroup
RadioButton
ToggleButton
CheckBox
RatingBar
Spinner
ScrollView
RecyclerView
Layout (This can be used to determine any layout)

Example 1:

1. Login Activity
   a. TextView – Login
   b. EditText – username
   c. EditText – password
   d. Button – Login
   e. Button – Register

c) Formulate the navigation from activity to another activity. You may list the navigation as shown in the example 2.

(10 Marks)

Example 2:
1. Click Register Button to navigate from Login Activity to Register Activity.

Question 04   (40 marks)

Write the code snippets to the following Questions. Consider the scenario in Question 03.

a) MainActivity will be developed as the login Activity. RegisterActivity will be loaded after clicking the register button. User will be navigated to the correct profile after successful login.

1. Construct the code snippet for the Register Button Click

(2 Marks)

2. Construct the code snippet for the Login Button click event. Note that you need to only consider the admin login. (Username: "Admin", Password: "admin@123").

(4 Marks)

3. Write the code snippet that will display a Toast Message to the admin when the password is wrong. (Implement the relevant logic as well)
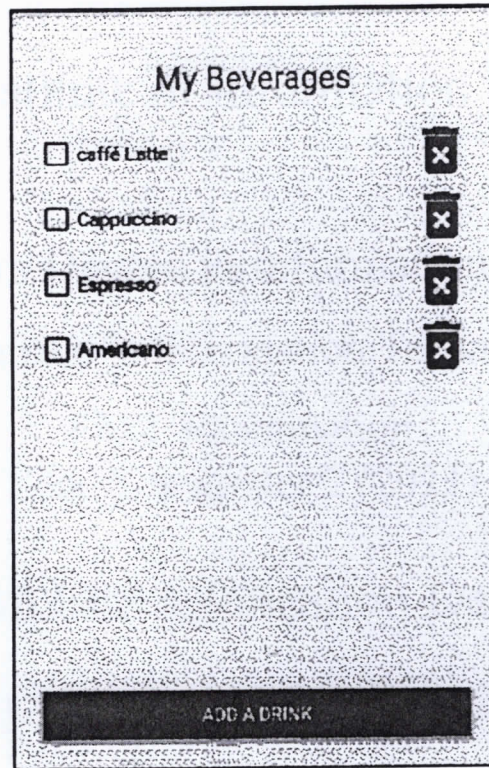
(4 Marks)

b) Refer to the given code in the Netexam and the UI below and write the answers for the following questions to implement the database operations.

Register

User Name
_____

Email
_____

Password
_____

Re-type Password
_____

REGISTER

CANCEL

1. Construct the suitable DAO interface for the User table.

(4 Marks)

2. Construct the repository for the above DAO.

(5 Marks)

3. Construct the code for the Register Button.

(6 Marks)

c) The developer decided to add a new screen for the customer login where they can keep a record of the drinks they have consumed. Refer to the given codes in the Netexam and the UI below and write the answers for the following questions.

1. To display the beverages in a list view, Recycler view has been used. Construct the code for the following classes/ methods in the Adapter Class.
    i. ViewHolder class   (3 Marks)
    ii. onCreateViewHolder method   (3 Marks)
2. When the user clicks the delete button the beverage should not be deleted if the beverage is not selected. Construct the code to address that scenario.
                                                (3 Marks)
3. When the user clicks the "ADD A DRINK" button there will be an alert pop up. Construct the suitable code for the Alert dialog box that can input the beverages.
                                                (6 Marks)

End of the Question Paper