0022

National University of Computer and Emerging Sciences

Islamabad Campus

Software for Mobile Devices (CS4039)

Sessional-II Exam

Total Time (Hrs): 1

Total Marks: 40

Total Questions: 4

Course Instructor(s):
Mr. Saad Salman

Date: Apr 9, 2025

Roll No **Course Section** **Student Signature**

Do not write below this line.

Attempt all the questions.

Instructions:

1. Read the question carefully, understand the question, and then attempt your answers in the provided answer booklet.
2. Verify that you have **Two (2)** printed page of the question paper including this page. There are **Four (4)** questions.
3. Calculator sharing is strictly prohibited.
4. Students are allowed to bring a cheat sheet of size A4. The sheet should be handwritten (one side only). Photocopies and printouts are not allowed. Sheets of any size other than A4 (smaller or bigger) aren't allowed. Sharing of cheat sheet is strictly prohibited and will result in F grade.
5. **Clearly mark your question number in the answer sheet. Attempt the questions on your answer sheet in sequential order; answering out of order may result in negative marking.**
6. Avoid long stories and irrelevant code while answering your question

Q1: Error Correction **[10 marks]**

See the attached code and the error in the code. Please encircle the error in the code. Write the line number along with the error and its fix in your answer sheet.

activity_main.xml | MainActivity.kt | MyAdapter.kt | AndroidManifest.xml | row.xml | MySqliteHelper.kt

```
import androidx.recyclerview.widget.RecyclerView

class MainActivity : AppCompatActivity() {
    var add:Button?=null
    @SuppressLint("MissingInflatedId")
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        var rv=findViewById<RecyclerView>(R.id.rv)

        add!!.setOnClickListener { it:View!
            startActivity(Intent( packageContext: this,Add::class.java))
        }
        var myHelper=MySqliteHelper( cr: this)
```

```
2024-04-02 00:11:15.814  9867-9867  AndroidRuntime    com.example.mysqliteex    E  FATAL EXCEPTION: main
                                                       Process: com.example.mysqliteex, PID: 9867
                                                       java.lang.RuntimeException: Unable to start activity ComponentInfo{com.example.mysqliteex/com.example.mysqliteex.MainActivity}:

java.lang.NullPointerException
                                                         at android.app.ActivityThread.performLaunchActivity(ActivityThread.java:3645)
                                                         at android.app.ActivityThread.handleLaunchActivity(ActivityThread.java:3782)
                                                         at android.app.servertransaction.LaunchActivityItem.execute(LaunchActivityItem.java:101)
                                                         at android.app.servertransaction.TransactionExecutor.executeCallbacks(TransactionExecutor.java:135)
                                                         at android.app.servertransaction.TransactionExecutor.execute(TransactionExecutor.java:95)
                                                         at android.app.ActivityThread$H.handleMessage(ActivityThread.java:2307)
                                                         at android.os.Handler.dispatchMessage(Handler.java:106)
                                                         at android.os.Looper.loopOnce(Looper.java:201)
                                                         at android.os.Looper.loop(Looper.java:288)
                                                         at android.app.ActivityThread.main(ActivityThread.java:7872)
                                                         at java.lang.reflect.Method.invoke(Native Method)
                                                         at com.android.internal.os.RuntimeInit$MethodAndArgsCaller.run(RuntimeInit.java:548)
                                                         at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:936)
                                                       Caused by: java.lang.NullPointerException
                                                         at com.example.mysqliteex.MainActivity.onCreate(MainActivity.kt:19)
```

```
at android.app.Activity.performCreate(Activity.java:8305)
at android.app.Activity.performCreate(Activity.java:8284)
at android.app.Instrumentation.callActivityOnCreate(Instrumentation.java:1417)
at android.app.ActivityThread.performLaunchActivity(ActivityThread.java:3626)
at android.app.ActivityThread.handleLaunchActivity(ActivityThread.java:3782)
at android.app.servertransaction.LaunchActivityItem.execute(LaunchActivityItem.java:101)
at android.app.servertransaction.TransactionExecutor.executeCallbacks(TransactionExecutor.java:135)
at android.app.servertransaction.TransactionExecutor.execute(TransactionExecutor.java:95)
at android.app.ActivityThread$H.handleMessage(ActivityThread.java:2307)
at android.os.Handler.dispatchMessage(Handler.java:106)
at android.os.Looper.loopOnce(Looper.java:201)
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at com.android.internal.os.ZygoteInit.main(ZygoteInit.java:936)
```

Q2: Draw activity lifecycle. Explain when each function is called? **[10 marks]**

Q3: Listed below are different types of database storage features for an android application.

Provide an example of a mobile application where each of the following database can be better use. Justify your solution by explaining how it can be used in the application [10 marks]

a. Shared Preference
b. SQLite
c. Firebase

Q4: Register Activity for Result **[10 marks]**

Suppose the two screens on the right. By clicking on the add button on the main activity, it will lead you to the add activity. After filling the data in the Add activity you can press save and the Add activity acts as the helper to get back the data from the other screen. In Kotlin this can be done using RegisterActivityforResult. Write code for the given scenario.

Bonus [5 Marks]

Checking papers is a boring process 😴 To make the process a bit more enjoyable, you are invited to write a clean and original joke. It can be related to Artificial Intelligence, Computer Science, or simply be witty and appropriate. If your joke brings a smile during evaluation, you will be awarded **up to 5 bonus marks**

(Write the here on the question paper)

There are 10 types of programmers, those who know binary & those who don't.

**** Good Luck ****

Q.3

(a) SharedPreference

=> Allows to store data locally as key-value pairs.

=> Useful when small amount of data needs to be stored & data persistance may be required.

=> Useful in applications in which some small data such as JWT tokens need to be stored.

=> Simple Login portal with user session management.

(b) SQLite

=> Lightweight version of SQL

=> Usable in application with complex database schema which needs to be mapped manually.

=> An application such as a Management System with complex relations between different types of users, tables for features etc.

(c) Firebase

=> Backend-as-a-Service

=> Useful when developing an android application & you do not want to building a backend from scratch.

=> Provides SDKs to use already made features of auth, push notifications, realtime database etc.

=> Social Media applications can use it as it provides many features such as auth, realtime database, push notifications with easy to use sdk's.

Q.1

=> Error :

Line Number : 19

Reason : the add button has not been initialized & is NULL. Thus, when an OnClickListener is ~~tried to be~~ added to it, NullPointerException is thrown as the add variable is NULL & no function of it can be called.

=> Fix :

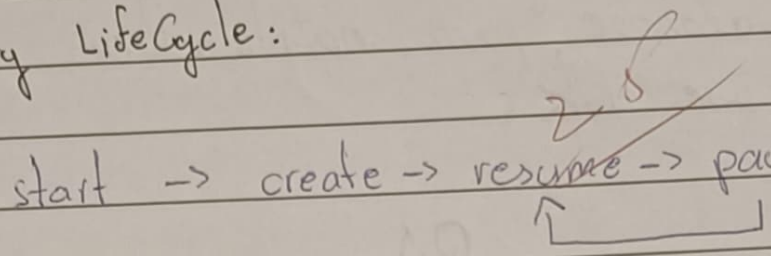
In the onCreate function add the following lines of code,

Line 18 : `add = findViewById<Button>(R.id.add)`

```
// assuming there exists a button view in the
// relevant XML layout file with the id
// add
```

Q.2

=> Activity LifeCycle:



=> Function Calling:

c> When application starts the onStart() function is called.

c> Then the onCreate() function is called, it attaches the relevant layout file with the activity.

c> Then the onResume() function is called. This function is called everytime when the current activity (which has not been destroyed yet) comes (back in scope.) as well as after the onCreate() function

c> The onPause() function is called whenever, the current activity goes out of scope such as when the user moves to on another application, activity etc.

↳ Lastly, the onDelete() function is called whenever the current activity is destroyed such as when we exit it.
It is called after the onPause() function.

↳ These functions can be overriden to allow us to perform certain computation whenever the state of an activity changes. Such as saving the current user data whenever the user exits the application. This can be done by overriding the onDelete() func. or loading data at startup using onCreate() function.

Q.4

=> AddActivity.kt

```
fun onCreate() {

val nameView= findViewById<EditTextView>(R.id.name)
val phoneView = findViewById<EditTextView>(R.id.phone)
val saveBtn = findViewById<Button>(R.id.save)

saveBtn.setOnClickListener {
    if(nameView.text == NULL or
            phaneView.text == NULL) {
            toast.makeToast("Fields Empty").show()
    }
    else {
    val nameD = nameView.text.toString()
    val phoneD = phoneView.text.toString()

    val i = Intent(this, MainActivity::class.java)
    i.putExtra("name", nameD)
    i.putExtra("phone", phoneD)

    startActivity(i)

}
}
```