FINAL

(SESSION SEPTEMBER 2024)

Programming for Mobile Devices
CCS21503

LECTURER :

SEPTEMBER 2024 **TIME : 3 HOURS**

Instructions :

1. Candidates must read all questions carefully.
2. The examination script consists of the followings:

Types of Questions	Instruction	Duration
ESSAY (Option)	Answer **4** out of 6 questions.	3 Hours

(ESSAY Option)
(100 Marks)

INSTRUCTION

This part consists of **SIX (6)** questions. Answer **FOUR (4)** questions only in the answer booklet provided.

(Question 1)

Programming for small devices involves creating application software specifically designed for low-power handheld devices like

(a) What are the recommended strategies for handling computationally intensive tasks in mobile applications?

(b) Explain the benefits of simplifying an application's design for small devices.

(c) Why is it important to prototype and plan before coding an application for small devices?

(Question 2)

As mobile technology continues to advance, the demand for intelligent and interactive applications is growing. With the advent (LLMs) such as OpenAI's GPT models, Google's Bard, and similar AI frameworks, developers have access to powerfu interactions, automating tasks, and personalizing content. Integrating LLMs into mobile applications can transform user expe language processing, contextual awareness, and adaptive learning directly within apps. However, building such intelligent appli to navigate challenges related to data processing, AI resource constraints, and cross-platform compatibility.

Currently, mobile platforms like Android and iOS are exploring how best to support LLM integration in a way that optimizes user privacy. As these platforms evolve, developers will need to consider both the technical requirements and the ethical implic apps. The potential of LLMs to enhance the intelligence and adaptability of mobile applications has opened new possibiliti which could shape the future of user interaction.

(a) Discuss the potential impacts of integrating LLMs into mobile applications on user experience and engagement.

(b) Explain the implications for developers aiming to build intelligent, cross-platform applications that incorporate LLM technolo

(c) Identify and discuss **TWO (2)** significant challenges developers face when integrating LLMs into mobile applications.

(Question 3)

As an Android app developer, you play a critical role in creating dynamic and user-friendly applications that leverage Android's in Java and Android framework components enables you to build efficient, scalable, and responsive apps. To demonstrate your core elements and how they interact within an app, answer the following questions based on key concepts in Java and Android

(a) How are data types defined and used within a Java class? Provide **THREE (3)** different examples to illustrate this concept.

(b) What is the primary function of the MainActivity in an Android application, and how does it interact with layouts?

(c) What is the significance of the "manifest" file in an Android application, and what kind of information does it contain?

(Question 4)

Based on the graphical user interface (GUI) depicted in **Figure 1**, you are required to complete the program code provided in sections marked with TODO comments. These comments include instructions for specific tasks that need to be implement handling, data validation, and interaction with external resources. Ensure that your completed code aligns with the visual described in **Figure 1**, providing a seamless user experience.

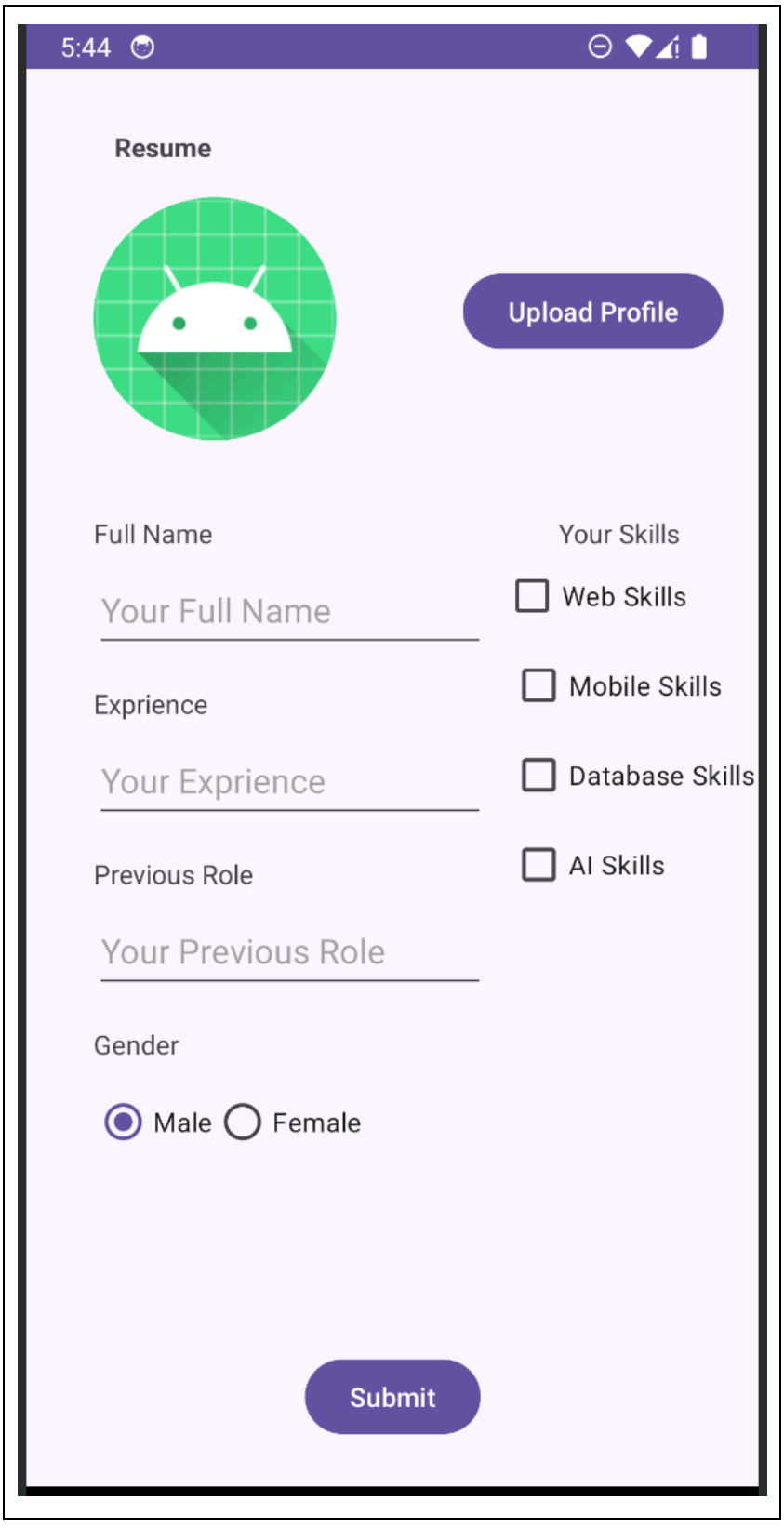

Figure 1

:

:

```
public class MainActivity extends AppCompatActivity {

    private TextView txtResume, txtFullName, txtPreviousRole, txtExperience, txtGender, txtWarningNam
txtWarningExperience, txtWarningRole;

    private EditText edtFullName, edtExperience, edtPreviousRole;

    private Button btnSubmit, btnUpload;

    private RadioGroup rdgGender;

    private ConstraintLayout parent;

    private CheckBox checkboxWebSkills, checkboxMobileSkills, checkboxDatabaseSkills, checkboxAISkill

    @Override
```

```
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // TODO 1: Initialize all the EditTexts
    //
.....................................................................................
       // TODO 2: Initialize all the CheckBoxes
        //
.....................................................................................
        // Initialize Submit Button and set OnClickListener
        btnSubmit = findViewById(R.id.btnSubmit);

        // Set OnClickListener for btnSubmit to call submitForm() on click
        btnSubmit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // TODO 3: Call method to process and display user input
                //
.....................................................................................

         }
        });
    }
    private void submitForm() {
        // TODO 4: Retrieve text from EditTexts
        //
.....................................................................................
        // Get state of CheckBoxes
       // TODO 5: Check if each skill checkbox is selected by setting each variable to the checked st
corresponding checkbox
        // Hint: Use isChecked() method to determine if each checkbox is selected
        //
.....................................................................................
        // Initialize RadioGroup
        rdgGender = findViewById(R.id.rdgGender);
        // Get selected gender from RadioGroup
        int selectedGenderId = rdgGender.getCheckedRadioButtonId();
        String gender = "";
        // TODO 6: Determine selected gender and assign "Male" or "Female" to `gender`
        //
.....................................................................................
        // Create buffer to display collected data as a summary
        StringBuilder buffer = new StringBuilder();
        // Append full name, experience, previous role, gender, and skills to buffer
        buffer.append("Full Name: ").append(fullName).append("\n");
        buffer.append("Experience: ").append(experience).append("\n");
        buffer.append("Previous Role: ").append(previousRole).append("\n");
        buffer.append("Gender: ").append(gender).append("\n");
        // TODO 7: Append CheckBox states to buffer
       //
.....................................................................................
        // Display the buffer content in a Toast message
        Toast.makeText(this, buffer.toString(), Toast.LENGTH_LONG).show();
    }
```

```
}
```

Figure 2

(Question 5)

As an Android app developer, your job is to design high-performance applications that make the most out of Android's a Android's main layers and core parts is key to building apps that are strong, efficient, scalable, and offer a great user experienc

(a) Identify and discuss **FOUR (4)** main components of the Android architecture.

(b) The Linux kernel is the foundation of the Android platform. Explain its roles in the Android OS.

(c) Identify and describe **THREE (3)** key responsibilities of the Android Runtime (ART) in the Android operating system.

(d) Differentiate between Platform Libraries and the Application Framework in Android and provide the supporting examples.

(Question 6)

As a mobile application developer, you are responsible for creating high-quality, user-friendly, and secure applications that perf devices and platforms. However, the growing demand for mobile apps and the expanding diversity of mobile devices present ur

(a) What are the primary challenges developers face when developing mobile applications?

(b) What strategies can developers employ to address the challenge of platform diversity in mobile app development?

(c) How does limited screen space impact UI design in mobile app development?

(d) What is the significance of user experience (UX) in the success of mobile applications?

(e) What are the key considerations for developers regarding security concerns in mobile app development?

END OF QUESTION