

**Computer Science Department
Midterm Exam- Summer- 2024
COMP 5450-AA Mobile Programming**

Github Link: <https://github.com/chandana-sree-krishna/Mobile-Programming-Midterm.git>

Q1. Create a calculator app that can perform addition, subtraction, multiplication, and division. You must use the When statement.

colors.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="black">#FF000000</color>
    <color name="white">#FFFFFF</color>
    <color name="purple_500">#6200EE</color>
    <color name="purple_700">#3700B3</color>
</resources>
```

themes.xml

```
<resources xmlns:tools="http://schemas.android.com/tools">
    <!-- Base application theme. -->
    <style name="Base.Theme.Midterm_Q1_Calculator"
parent="Theme.MaterialComponents.DayNight.DarkActionBar">
        <!-- Customize your light theme here. -->
        <item name="colorPrimary">@color/purple_500</item>
        <item name="colorPrimaryVariant">@color/purple_700</item>
        <item name="colorOnPrimary">@color/white</item>
        <item name="android:statusBarColor">@color/purple_700</item>
    </style>

    <style name="Theme.Midterm_Q1_Calculator"
parent="Base.Theme.Midterm_Q1_Calculator" />
</resources>
```

MainActivity.kt

```
package com.example.midterm_q1_calculator

import android.os.Bundle
import android.view.View
import android.widget.AdapterView
import android.widget.ArrayAdapter
```

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1226847

```
import android.widget.Button
import android.widget.EditText
import android.widget.Spinner
import android.widget.TextView
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)
        val button: Button = findViewById(R.id.btResult)
        val edttx1: EditText = findViewById(R.id.ednum1)
        val edttx2: EditText = findViewById(R.id.ednum2)
        val resultTV: TextView = findViewById(R.id.textResult)
        //global variable
        var flag : String = "addition"
        //create a spinner items (options)
        val spinnerVal : Spinner = findViewById(R.id.spSelect)
        var options =
        arrayOf("addition","subtraction","multiplication","division")
        spinnerVal.adapter =
        ArrayAdapter<String>(this,android.R.layout.simple_list_item_1,options )
        button.setOnClickListener{ view ->
            var x: Int = edttx1.text.toString().toInt();
            var y: Int = edttx2.text.toString().toInt();

            resultTV.text = when (flag) {
                "addition" -> add(x, y)
                "subtraction" -> subtract(x, y)
                "multiplication" -> multiply(x, y)
                "division" -> divide(x, y)
                else -> "Invalid operation"
            }
        }
        spinnerVal.onItemSelectedListener = object :
        AdapterView.OnItemSelectedListener{
            override fun onItemSelected(p0: AdapterView<*>?, p1: View?, p2: Int, p3: Long) {
                flag = options.get(p2) //p2 is the index of selected item
            }
            override fun onNothingSelected(p0: AdapterView<*>?) {
                TODO("Not yet implemented")
            }
        }
    }
    public fun add(a: Int, b: Int): String {
        return (a+b).toString();
    }

    public fun subtract(a:Int, b:Int): String{
        return (a-b).toString();
    }
}
```

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1226847

```
public fun multiply(a: Int, b: Int): String {
    return (a*b).toString();
}

public fun divide(a:Int, b:Int): String{
    if(b==0){
        return "Division by 0 not allowed";
    }
    else{
        return (a.toFloat()/b.toFloat()).toString();
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_marginStart="10dp"
    android:layout_marginTop="10dp"
    android:layout_marginEnd="10dp"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:text="Calculations"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.131" />

    <EditText
        android:id="@+id/ednum1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="number"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
```

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1226847

```
        android:id="@+id/ednum2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="number"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.644" />

    <TextView
        android:id="@+id/textResult"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Result"
        android:textSize="24sp"
        app:layout_constraintBottom_toTopOf="@+id/btResult"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.501"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ednum2"
        app:layout_constraintVertical_bias="0.697" />

    <Button
        android:id="@+id/btResult"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="RESULT"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ednum2"
        app:layout_constraintVertical_bias="0.7" />

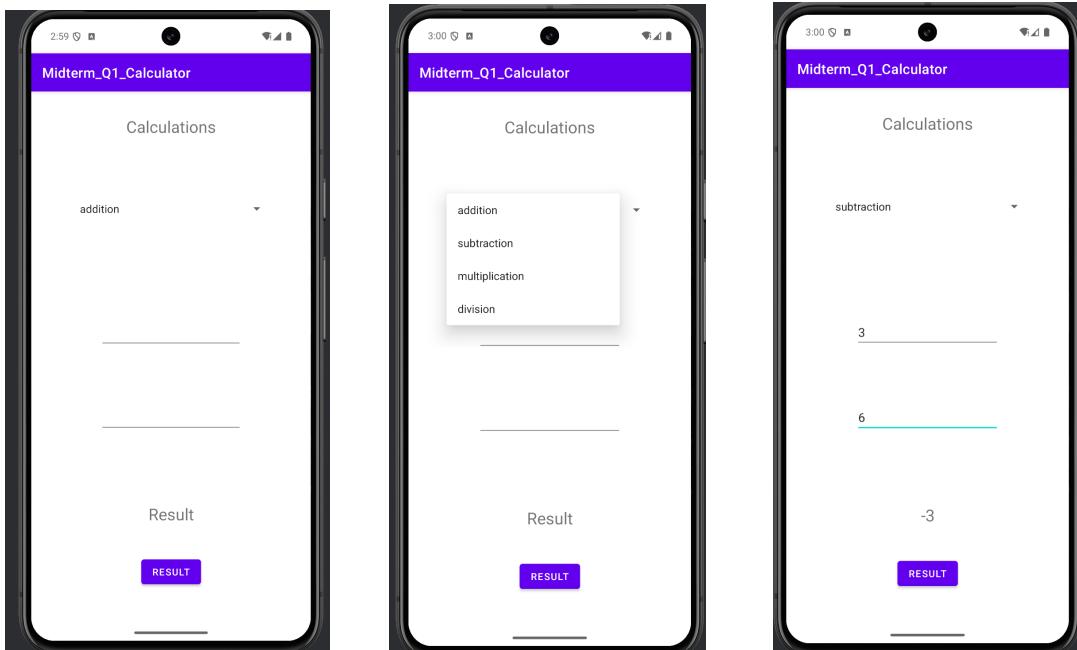
    <Spinner
        android:id="@+id/spSelect"
        android:layout_width="300dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="56dp"
        android:layout_marginEnd="10dp"
        app:layout_constraintBottom_toTopOf="@+id/ednum1"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.153" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

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Figure 1: Design



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Q2. Create an app of your choice(do not repeat question 1) as a topic that uses several views with at least a Button and Spinner with their Listeners (setOnClickListener and onItemSelectedListener), accordingly.

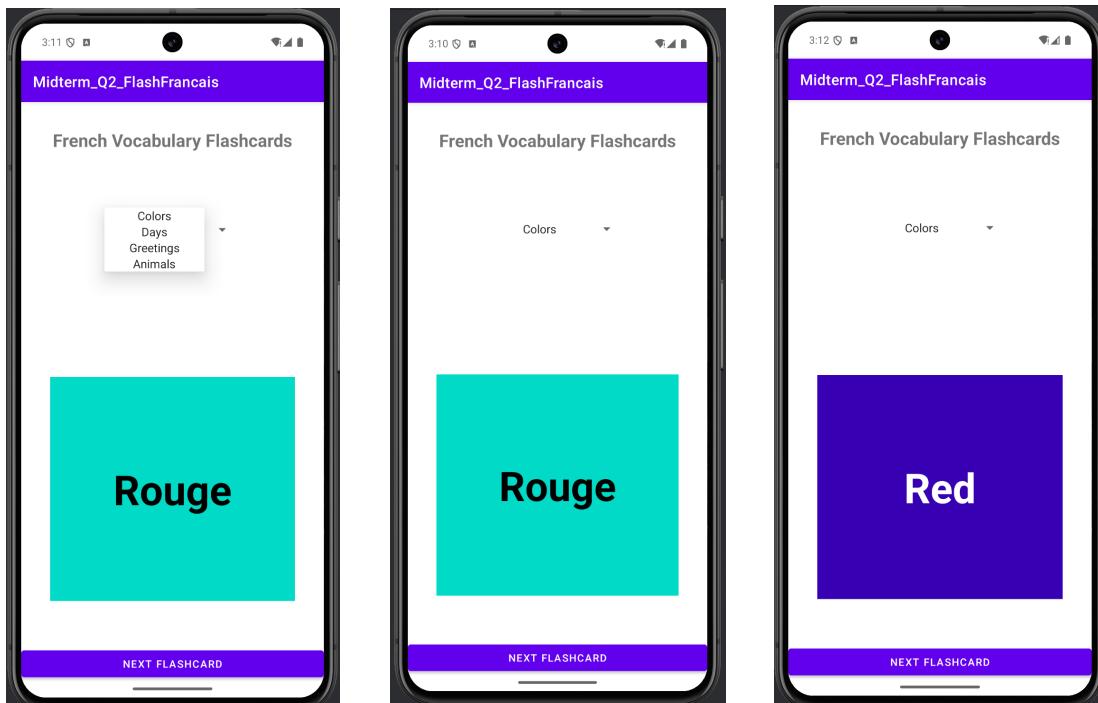
FlashFrancais is a simple Android application for learning French vocabulary through flashcards.

Features

Display French words and their English translations on interactive flashcards.

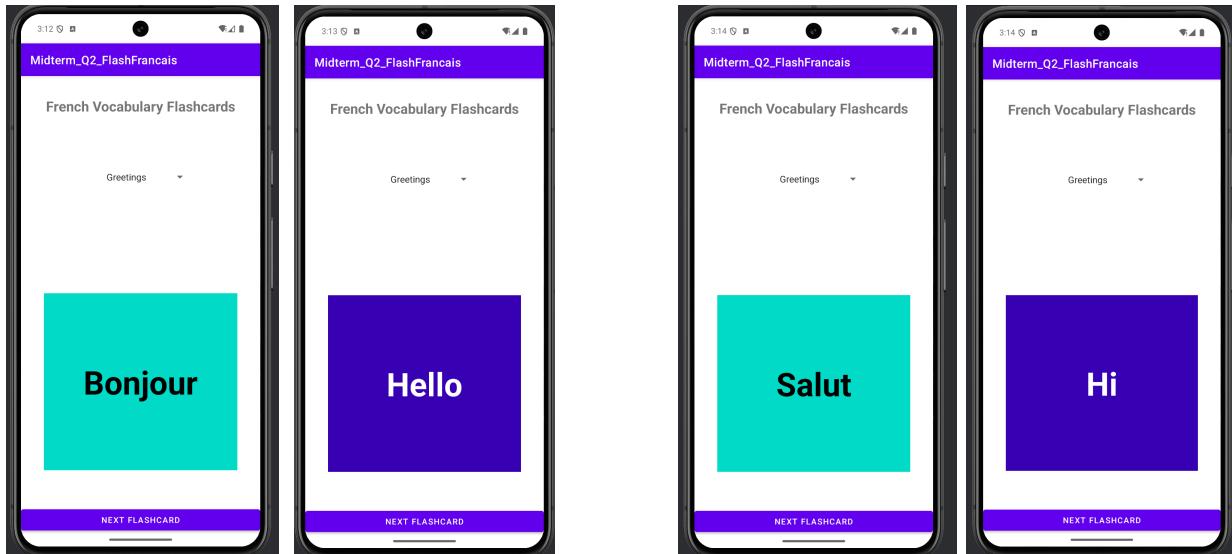
Toggle between French and English by tapping on the flashcard text.

Supports multiple categories: colors, days of the week, greetings, animals, and more.



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MainActivity.kt

```
package com.example.midterm_q2_flashfrancais

import android.os.Bundle
import android.view.View
import android.widget.AdapterView
import android.widget.ArrayAdapter
import android.widget.Button
import android.widget.Spinner
import android.widget.TextView
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat

class MainActivity : AppCompatActivity() {

    private lateinit var flashcardsMap: Map<String, List<Flashcard>>
    private var currentCardIndex = 0
    private lateinit var currentCategory: String

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)

        val categorySpinner: Spinner = findViewById(R.id.category_spinner)
        val nextFlashcardButton: Button =
            findViewById(R.id.next_flashcard_button)

        // Set up Spinner
        categorySpinner.adapter = ArrayAdapter.createFromResource(
            this,
```

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1226847

```
R.array.french_categories,
        android.R.layout.simple_spinner_item
    )
categorySpinner.setAdapter(categorySpinner.adapter)

// Initialize flashcards map with data
flashcardsMap = mapOf(
    "Colors" to listOf(
        Flashcard("Rouge", "Red"),
        Flashcard("Vert", "Green"),
        Flashcard("Bleu", "Blue"),
        Flashcard("Jaune", "Yellow"),
        Flashcard("Noir", "Black"),
        Flashcard("Blanc", "White"),
        Flashcard("Gris", "Gray"),
        Flashcard("Orange", "Orange"),
        Flashcard("Violet", "Purple"),
        Flashcard("Rose", "Pink"),
        Flashcard("Marron", "Brown"),
        Flashcard("Turquoise", "Turquoise"),
        Flashcard("Argenté", "Silver"),
        Flashcard("Doré", "Gold"),
        Flashcard("Bordeaux", "Maroon"),
        // Add more colors as needed
    ),
    "Days" to listOf(
        Flashcard("Lundi", "Monday"),
        Flashcard("Mardi", "Tuesday"),
        Flashcard("Mercredi", "Wednesday"),
        Flashcard("Jeudi", "Thursday"),
        Flashcard("Vendredi", "Friday"),
        Flashcard("Samedi", "Saturday"),
        Flashcard("Dimanche", "Sunday")
        // All days of the week
    ),
    "Greetings" to listOf(
        Flashcard("Bonjour", "Hello"),
        Flashcard("Salut", "Hi"),
        Flashcard("Bonsoir", "Good evening"),
        Flashcard("Bon après-midi", "Good afternoon"),
        Flashcard("Bonne nuit", "Good night"),
        Flashcard("Bienvenue", "Welcome"),
        Flashcard("Coucou", "Hey there")
        // Add more greetings as needed
    ),
    "Animals" to listOf(
        Flashcard("Chat", "Cat"),
        Flashcard("Chien", "Dog"),
        Flashcard("Oiseau", "Bird"),
        Flashcard("Lapin", "Rabbit"),
        Flashcard("Poisson", "Fish"),
        Flashcard("Cheval", "Horse"),
        Flashcard("Vache", "Cow"),
        Flashcard("Souris", "Mouse"),
        Flashcard("Éléphant", "Elephant"),
        Flashcard("Girafe", "Giraffe"),
        Flashcard("Serpent", "Snake"),
        // Add more animals as needed
    )
)
```

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```
        Flashcard("Tigre", "Tiger"),
        Flashcard("Lion", "Lion"),
        Flashcard("Renard", "Fox"),
        Flashcard("Abeille", "Bee"),
        Flashcard("Poule", "Chicken"),
        Flashcard("Cochon", "Pig"),
        Flashcard("Papillon", "Butterfly"),
        Flashcard("Coccinelle", "Ladybug"),
        Flashcard("Loup", "Wolf")
        // Add more animals as needed
    )
)

// Set default category
//currentCategory = "Colors"
//displayFlashcard()

// Set up Spinner onItemSelectedListener
categorySpinner.onItemSelectedListener = object :
AdapterView.OnItemSelectedListener {
    override fun onItemSelected(parent: AdapterView<*>?, view: View?,
position: Int, id: Long) {
        currentCategory =
parent?.getItemAtPosition(position).toString()
        currentCardIndex = 0 // Reset index when category changes
        displayFlashcard()
    }

    override fun onNothingSelected(parent: AdapterView<*>?) {
        // Handle case where nothing is selected
    }
}

// Set up Button onClickListener
nextFlashcardButton.setOnClickListener {
    currentCardIndex = (currentCardIndex + 1) %
flashcardsMap[currentCategory]!!.size
    displayFlashcard()
}

private fun displayFlashcard() {
    val flashcard = flashcardsMap[currentCategory]!![currentCardIndex]
    val frenchWordTextView: TextView = findViewById(R.id.french_word)
    val englishTranslationTextView: TextView =
findViewById(R.id.english_translation)

    frenchWordTextView.text = flashcard.frenchWord
    englishTranslationTextView.text = flashcard.englishTranslation

    // Hide all text views except the first one (French word) initially
    frenchWordTextView.visibility = View.VISIBLE
    englishTranslationTextView.visibility = View.GONE

    // Set up click listener to switch between views
}
```

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```
        frenchWordTextView.setOnClickListener {
            toggleVisibility(frenchWordTextView, englishTranslationTextView)
        }
        englishTranslationTextView.setOnClickListener {
            toggleVisibility(englishTranslationTextView, frenchWordTextView)
        }

    }

    private fun toggleVisibility(viewToHide: TextView, viewToShow: TextView)
{
    viewToHide.visibility = View.GONE
    viewToShow.visibility = View.VISIBLE
}

}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/french_word"
        android:layout_width="333dp"
        android:layout_height="304dp"
        android:background="@color/colorSecondary"
        android:gravity="center"
        android:textColor="@color/colorOnSecondary"
        android:textSize="56sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.785"
        tools:text="Bonjour" />

    <TextView
        android:id="@+id/english_translation"
        android:layout_width="333dp"
        android:layout_height="304dp"
        android:background="@color/colorPrimaryVariant"
        android:gravity="center"
        android:textColor="@color/colorOnPrimary"
        android:textSize="56sp"
```

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1226847

```
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.785"
        tools:text="Hello" />

    <TextView
        android:id="@+id/title_text"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:gravity="center"
        android:text="@string/french_vocab_flashcards"
        android:textSize="24sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.141" />

    <Spinner
        android:id="@+id/category_spinner"
        android:layout_width="184dp"
        android:layout_height="60dp"
        android:dropDownWidth="match_parent"
        android:dropDownHeight="match_parent"
        android:entries="@array/french_categories"
        android:prompt="@string/select_category_prompt"
        android:scrollbarSize="26dp"
        android:textAlignment="center"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.292" />

    <Button
        android:id="@+id/next_flashcard_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="Next Flashcard"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintTop_toTopOf="@+id/title_text"
        app:layout_constraintVertical_bias="0.97"
        tools:layout_editor_absoluteX="0dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Strings.xml

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```
<resources>
    <string name="app_name">Midterm_Q2_FlashFrancais</string>
    <string name="select_category_prompt">Select a category</string>
    <string name="french_vocab_flashcards">French Vocabulary
Flashcards</string>
    <!-- Categories for French vocabulary -->
    <string-array name="french_categories">
        <item>Colors</item>
        <item>Days</item>
        <item>Greetings</item>
        <item>Animals</item>
        <!-- Add more categories as needed -->
    </string-array>
</resources>
```

Flashcard.kt

```
package com.example.midterm_q2_flashfrancais

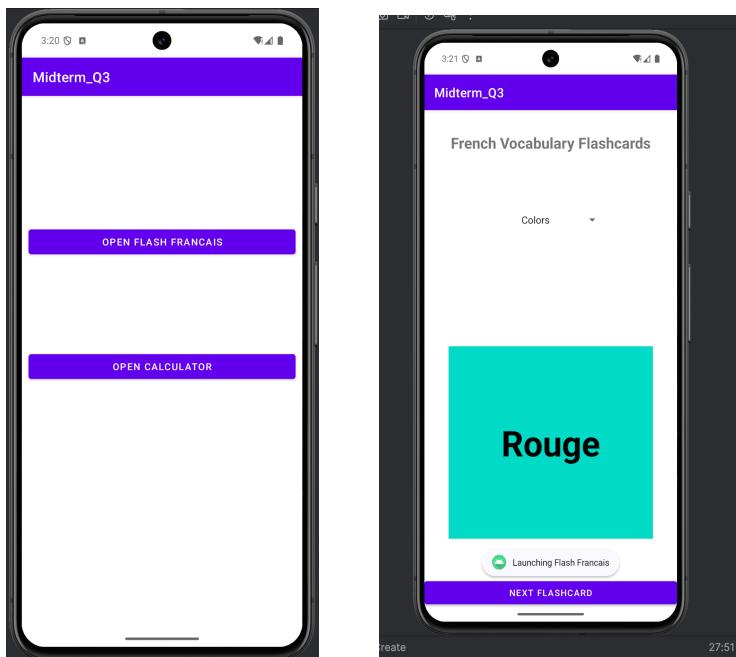
data class Flashcard(
    val frenchWord: String,
    val englishTranslation: String,
)
```

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Q3. Create an app on your choice of topic that uses an activity that calls the previous two apps and sends data using putExtra.

In the 3rd app, I have created 2 buttons to open the two apps. When the buttons are clicked, corresponding apps are opened and a message is displayed “Launching <app_name>”.

Press back button to go back to the previous page to select the 2nd app.



The message Launching Flash Francais is displayed.

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After going back and clicking on the “OPEN CALCULATOR” button, the message is displays the message “Launching Calculator”

After opening the apps, it functions the same

CalculatorActivity.kt

```
package com.example.midterm_q3

import android.content.Intent
import android.os.Bundle
import android.view.View
import android.widget.AdapterView
import android.widget.ArrayAdapter
import android.widget.Button
import android.widget.EditText
import android.widget.Spinner
import android.widget.TextView
import android.widget.Toast
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity

class CalculatorActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_first)

        val bundle: Bundle? = intent.extras
        bundle?.let {
            val msg = bundle.getString("extra_data")
```

Chandana Sree Krishna

1226847

```
        Toast.makeText(this,msg,Toast.LENGTH_SHORT).show()
    }

    val button: Button = findViewById(R.id.btResult)
    val edtxt1: EditText = findViewById(R.id.ednum1)
    val edtxt2: EditText = findViewById(R.id.ednum2)
    val resultTV: TextView = findViewById(R.id.textResult)

    var flag : String = "addition"
//create a spinner items (options)
    val spinnerVal : Spinner = findViewById(R.id.spSelect)
    var options =
arrayOf("addition","subtraction","multiplication","division")
    spinnerVal.adapter =
ArrayAdapter<String>(this,android.R.layout.simple_list_item_1,options )
    button.setOnClickListener{ view ->
        var x: Int = edtxt1.text.toString().toInt();
        var y: Int = edtxt2.text.toString().toInt();

        resultTV.text = when (flag) {
            "addition" -> add(x, y)
            "subtraction" -> subtract(x, y)
            "multiplication" -> multiply(x, y)
            "division" -> divide(x, y)
            else -> "Invalid operation"
        }
    }

    spinnerVal.onItemSelectedListener = object :
AdapterView.OnItemSelectedListener{
        override fun onItemSelected(p0: AdapterView<*>?, p1: View?,
p2: Int, p3: Long) {
            flag = options.get(p2) //p2 is the index of selected item
        }
        override fun onNothingSelected(p0: AdapterView<*>?) {
            TODO("Not yet implemented")
        }
    }
}

private fun add(a: Int, b: Int): String {
    return (a+b).toString();
}

private fun subtract(a:Int, b:Int): String{
    return (a-b).toString();
}

private fun multiply(a: Int, b: Int): String {
    return (a*b).toString();
}

private fun divide(a:Int, b:Int): String{
    if(b==0){
        return "Division by 0 not allowed";
    }
    else{
```

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1226847

```
        return (a.toFloat() / b.toFloat()).toString();
    }
}

}
```

MainActivity.kt

```
package com.example.midterm_q3

import android.content.Intent
import android.os.Bundle
import android.widget.Button
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)
        val btnCalculator: Button = findViewById(R.id.btnCalculator)
        val btnColorSelector: Button = findViewById(R.id.btnColorSelector)

        btnCalculator.setOnClickListener {
            val intent = Intent(this, CalculatorActivity::class.java)
            intent.putExtra("extra_data", "Launching Calculator")
            startActivity(intent)
        }

        btnColorSelector.setOnClickListener {
            val intent = Intent(this, SecondActivity::class.java)
            intent.putExtra("extra_data", "Launching Flash Francais")
            startActivity(intent)
        }
    }
}
```

SecondActivity.kt

```
package com.example.midterm_q3

import android.os.Bundle
import android.view.View
import android.widget.AdapterView
import android.widget.ArrayAdapter
import android.widget.Button
import android.widget.Spinner
import android.widget.TextView
import android.widget.Toast
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
```

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1226847

```
class SecondActivity : AppCompatActivity() {

    private lateinit var flashcardsMap: Map<String, List<Flashcard>>
    private var currentCardIndex = 0
    private lateinit var currentCategory: String

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_second)

        val bundle: Bundle? = intent.extras
        bundle?.let {
            val msg = bundle.getString("extra_data")
            Toast.makeText(this, msg, Toast.LENGTH_SHORT).show()
        }

        val categorySpinner: Spinner = findViewById(R.id.category_spinner)
        val nextFlashcardButton: Button =
            findViewById(R.id.next_flashcard_button)

        // Set up Spinner
        categorySpinner.adapter = ArrayAdapter.createFromResource(
            this,
            R.array.french_categories,
            android.R.layout.simple_spinner_item
        )
        categorySpinner.setAdapter(categorySpinner.adapter)

        // Initialize flashcards map with data
        flashcardsMap = mapOf(
            "Colors" to listOf(
                Flashcard("Rouge", "Red"),
                Flashcard("Vert", "Green"),
                Flashcard("Bleu", "Blue"),
                Flashcard("Jaune", "Yellow"),
                Flashcard("Noir", "Black"),
                Flashcard("Blanc", "White"),
                Flashcard("Gris", "Gray"),
                Flashcard("Orange", "Orange"),
                Flashcard("Violet", "Purple"),
                Flashcard("Rose", "Pink"),
                Flashcard("Marron", "Brown"),
                Flashcard("Turquoise", "Turquoise"),
                Flashcard("Argenté", "Silver"),
                Flashcard("Doré", "Gold"),
                Flashcard("Bordeaux", "Maroon"),
                // Add more colors as needed
            ),
            "Days" to listOf(
                Flashcard("Lundi", "Monday"),
                Flashcard("Mardi", "Tuesday"),
                Flashcard("Mercredi", "Wednesday"),
                Flashcard("Jeudi", "Thursday"),
                Flashcard("Vendredi", "Friday"),
                Flashcard("Samedi", "Saturday"),
            )
        )
    }
}
```

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1226847

```
        Flashcard("Dimanche", "Sunday")
        // All days of the week
    ),
    "Greetings" to listOf(
        Flashcard("Bonjour", "Hello"),
        Flashcard("Salut", "Hi"),
        Flashcard("Bonsoir", "Good evening"),
        Flashcard("Bon après-midi", "Good afternoon"),
        Flashcard("Bonne nuit", "Good night"),
        Flashcard("Bienvenue", "Welcome"),
        Flashcard("Coucou", "Hey there")
        // Add more greetings as needed
),
    "Animals" to listOf(
        Flashcard("Chat", "Cat"),
        Flashcard("Chien", "Dog"),
        Flashcard("Oiseau", "Bird"),
        Flashcard("Lapin", "Rabbit"),
        Flashcard("Poisson", "Fish"),
        Flashcard("Cheval", "Horse"),
        Flashcard("Vache", "Cow"),
        Flashcard("Souris", "Mouse"),
        Flashcard("Éléphant", "Elephant"),
        Flashcard("Girafe", "Giraffe"),
        Flashcard("Serpent", "Snake"),
        Flashcard("Tigre", "Tiger"),
        Flashcard("Lion", "Lion"),
        Flashcard("Renard", "Fox"),
        Flashcard("Abeille", "Bee"),
        Flashcard("Poule", "Chicken"),
        Flashcard("Cochon", "Pig"),
        Flashcard("Papillon", "Butterfly"),
        Flashcard("Coccinelle", "Ladybug"),
        Flashcard("Loup", "Wolf")
        // Add more animals as needed
)
)

// Set default category
//currentCategory = "Colors"
//displayFlashcard()

// Set up Spinner onItemSelectedListener
categorySpinner.onItemSelectedListener = object :
AdapterView.OnItemSelectedListener {
    override fun onItemSelected(parent: AdapterView<*>?, view: View?,
position: Int, id: Long) {
        currentCategory =
parent?.getItemAtPosition(position).toString()
        currentCardIndex = 0 // Reset index when category changes
        displayFlashcard()
    }

    override fun onNothingSelected(parent: AdapterView<*>?) {
        // Handle case where nothing is selected
    }
}
```

Chandana Sree Krishna

1226847

```
// Set up Button onClickListener
nextFlashcardButton.setOnClickListener {
    currentCardIndex = (currentCardIndex + 1) %
flashcardsMap[currentCategory]!!.size
    displayFlashcard()
}
}

private fun displayFlashcard() {
    val flashcard = flashcardsMap[currentCategory]!![currentCardIndex]
    val frenchWordTextView: TextView = findViewById(R.id.french_word)
    val englishTranslationTextView: TextView =
findViewById(R.id.english_translation)

    frenchWordTextView.text = flashcard.frenchWord
    englishTranslationTextView.text = flashcard.englishTranslation

    // Hide all text views except the first one (French word) initially
    frenchWordTextView.visibility = View.VISIBLE
    englishTranslationTextView.visibility = View.GONE

    // Set up click listener to switch between views
    frenchWordTextView.setOnClickListener {
        toggleVisibility(frenchWordTextView, englishTranslationTextView)
    }
    englishTranslationTextView.setOnClickListener {
        toggleVisibility(englishTranslationTextView, frenchWordTextView)
    }
}

private fun toggleVisibility(viewToHide: TextView, viewToShow: TextView)
{
    viewToHide.visibility = View.GONE
    viewToShow.visibility = View.VISIBLE
}

}
```

flashcard.kt

```
package com.example.midterm_q3

data class Flashcard(
    val frenchWord: String,
    val englishTranslation: String,
)
```

activity_first.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
```

Chandana Sree Krishna

1226847

```
xmlns:tools="http://schemas.android.com/tools"
xmlns:app="http://schemas.android.com/apk/res-auto"
android:id="@+id/main"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_marginStart="10dp"
android:layout_marginTop="10dp"
android:layout_marginEnd="10dp"
tools:context=".MainActivity">

<TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="20dp"
    android:text="Calculations"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.131" />

<EditText
    android:id="@+id/ednum1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="number"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/ednum2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="number"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.644" />

<TextView
    android:id="@+id/textResult"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Result"
    android:textSize="24sp"
    app:layout_constraintBottom_toTopOf="@+id/btResult"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.501"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/ednum2"
```

Chandana Sree Krishna

1226847

```
    app:layout_constraintVertical_bias="0.697" />

    <Button
        android:id="@+id/btResult"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="RESULT"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ednum2"
        app:layout_constraintVertical_bias="0.7" />

    <Spinner
        android:id="@+id/spSelect"
        android:layout_width="300dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="56dp"
        android:layout_marginEnd="10dp"
        app:layout_constraintBottom_toTopOf="@+id/ednum1"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.153" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btnCalculator"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:text="Open Calculator"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.526"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.553" />

    <Button
        android:id="@+id/btnColorSelector"
        android:layout_width="match_parent"
```

Chandana Sree Krishna

1226847

```
        android:layout_height="wrap_content"
        android:text="Open Flash Francais"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.342" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_second.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/french_word"
        android:layout_width="333dp"
        android:layout_height="304dp"
        android:background="@color/colorSecondary"
        android:gravity="center"
        android:textColor="@color/colorOnSecondary"
        android:textSize="56sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.785"
        tools:text="Bonjour" />

    <TextView
        android:id="@+id/english_translation"
        android:layout_width="333dp"
        android:layout_height="304dp"
        android:background="@color/colorPrimaryVariant"
        android:gravity="center"
        android:textColor="@color/colorOnPrimary"
        android:textSize="56sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.785"
        tools:text="Hello" />
```

Chandana Sree Krishna

1226847

```
<TextView
    android:id="@+id/title_text"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="20dp"
    android:gravity="center"
    android:text="@string/french_vocab_flashcards"
    android:textSize="24sp"
    android:textStyle="bold"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.141" />

<Spinner
    android:id="@+id/category_spinner"
    android:layout_width="184dp"
    android:layout_height="60dp"
    android:dropDownWidth="match_parent"
    android:dropDownHeight="match_parent"
    android:entries="@array/french_categories"
    android:prompt="@string/select_category_prompt"
    android:scrollbarSize="26dp"
    android:textAlignment="center"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.497"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.292" />

<Button
    android:id="@+id/next_flashcard_button"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:text="Next Flashcard"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintTop_toTopOf="@+id/title_text"
    app:layout_constraintVertical_bias="0.97"
    tools:layout_editor_absoluteX="0dp" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Colors.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="black">#FF000000</color>
    <color name="white">#FFFFFF</color>
    <color name="colorPrimary">#6200EE</color>
    <color name="colorPrimaryVariant">#3700B3</color>
    <color name="colorOnPrimary">#FFFFFF</color>
    <color name="colorSecondary">#03DAC6</color>
```

Chandana Sree Krishna

1226847

```
<color name="colorSecondaryVariant">#018786</color>
<color name="colorOnSecondary">#000000</color>
</resources>
```

Strings.xml

```
<resources>
    <string name="app_name">Midterm_Q3</string>
    <string name="select_category_prompt">Select a category</string>
    <string name="french_vocab_flashcards">French Vocabulary Flashcards</string>
    <!-- Categories for French vocabulary -->
    <string-array name="french_categories">
        <item>Colors</item>
        <item>Days</item>
        <item>Greetings</item>
        <item>Animals</item>
        <!-- Add more categories as needed -->
    </string-array>
</resources>
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Midterm_Q3"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity android:name="com.example.midterm_q3.CalculatorActivity" />
        <activity android:name="com.example.midterm_q3.SecondActivity" />
    </application>

</manifest>
```