Programmation mobile

Cours 2 : `Intent`

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UPEC
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Rappel : lancer une `Activity` sans attendre de résultat

Dans l'`Activity` appelante :

```
int value1 = ...;
String value2 = ...;

// Intent explicite
Intent intent = new Intent(context, NewActivity.class);
intent.putExtra("Key1",value1);
intent.putExtra("Key2",value2);

startActivity(intent);
```

Dans `NewActivity` :

```
Intent intent = getIntent();

int myInt = intent.getIntExtra("Key1",42);
String myString = intent.getStringExtra("Key2");
```

Quatre façons de lancer une `Activity`

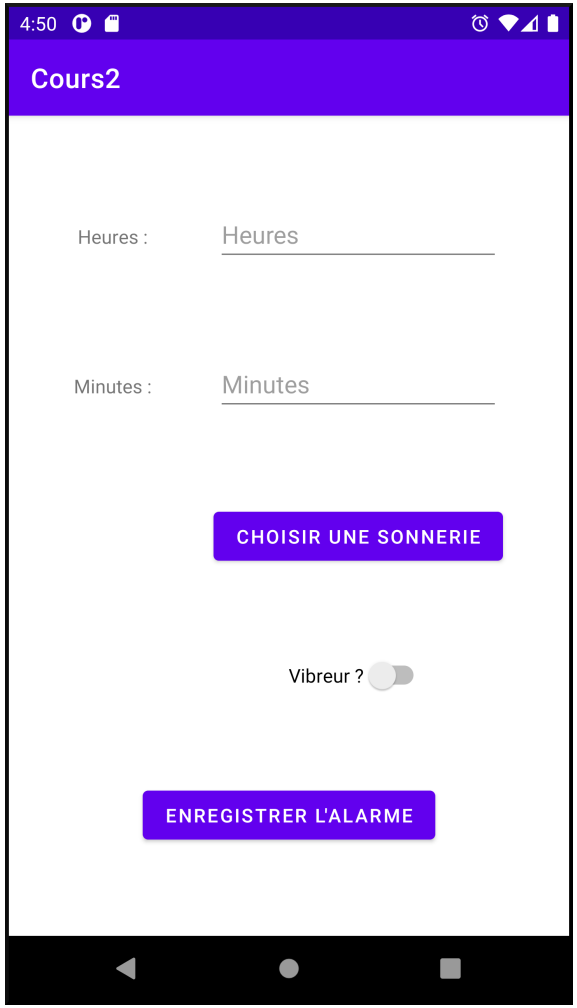
Deux types d'`Intent` :

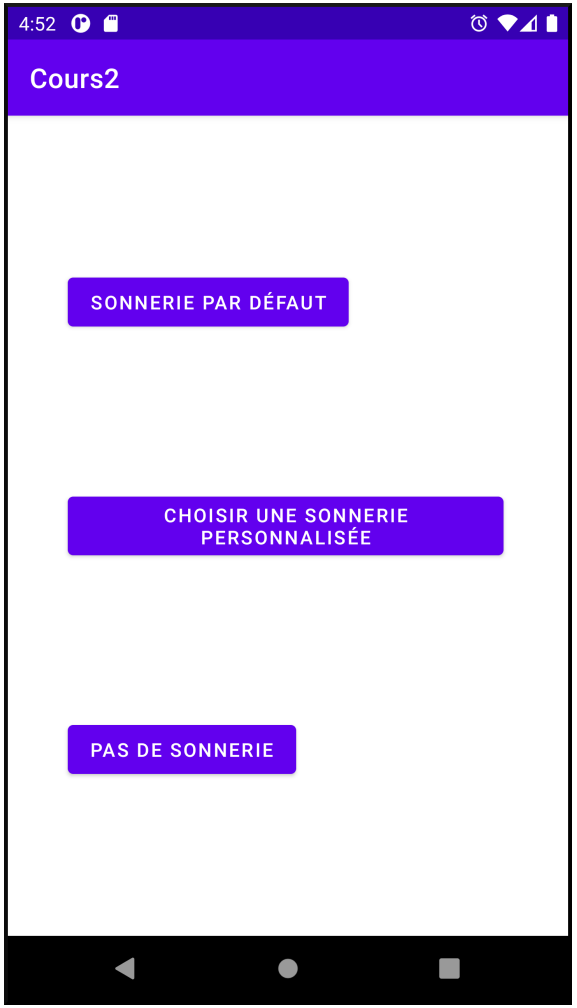
- explicite (en nommant l'`Activity`)
- implicite (en spécifiant le type d'action)

Deux manières de lancer une `Activity` :

- sans attendre de résultat : `startActivity()`
- dans l'attente d'un résultat : `registerForActivityResult()`

Application du jour : Alarme





Application du jour : Alarme

Trois appels à une autre `Activity` :

1. "Choisir une sonnerie" : explicite, avec résultat
2. "Choisir une sonnerie personnalisée" : implicite, avec résultat
3. "Enregistrer l'alarme" : implicite, sans résultat

On a déjà vu les appels explicites sans résultat.

MainActivity layout

Cours2 – activity_main.xml [Cours2.app]

```
51        android:id="@+id/add"
52        android:layout_width="wrap_content"
53        android:layout_height="wrap_content"
54        android:text="Enregistrer l'alarme"
55        app:layout_constraintBottom_toBottomOf="parent"
56        app:layout_constraintEnd_toEndOf="parent"
57        app:layout_constraintHorizontal_bias="0.5"
58        app:layout_constraintStart_toStartOf="parent"
59        app:layout_constraintTop_toBottomOf="@+id/vibreur" />
60
61    <EditText
62        android:id="@+id/hours"
63        android:layout_width="wrap_content"
64        android:layout_height="wrap_content"
65        android:ems="10"
66        android:hint="Heures"
67        android:inputType="numberDecimal"
68        app:layout_constraintBottom_toTopOf="@+id/minutes"
69        app:layout_constraintEnd_toEndOf="parent"
70        app:layout_constraintHorizontal_bias="0.5"
71        app:layout_constraintStart_toEndOf="@+id/tHours"
72        app:layout_constraintTop_toTopOf="parent" />
73
74    <EditText
75        android:id="@+id/minutes"
76        android:layout_width="wrap_content"
77        android:layout_height="wrap_content"
78        android:ems="10"
79        android:hint="Minutes"
80        android:inputType="numberDecimal"
81        app:layout_constraintBottom_toTopOf="@+id/ringtone"
82        app:layout_constraintEnd_toEndOf="@+id/hours"
83        app:layout_constraintHorizontal_bias="0.5"
84        app:layout_constraintStart_toStartOf="@+id/hours"
85        app:layout_constraintTop_toBottomOf="@+id/hours" />
86
87 </androidx.constraintlayout.widget.ConstraintLayout>
```


Attributes

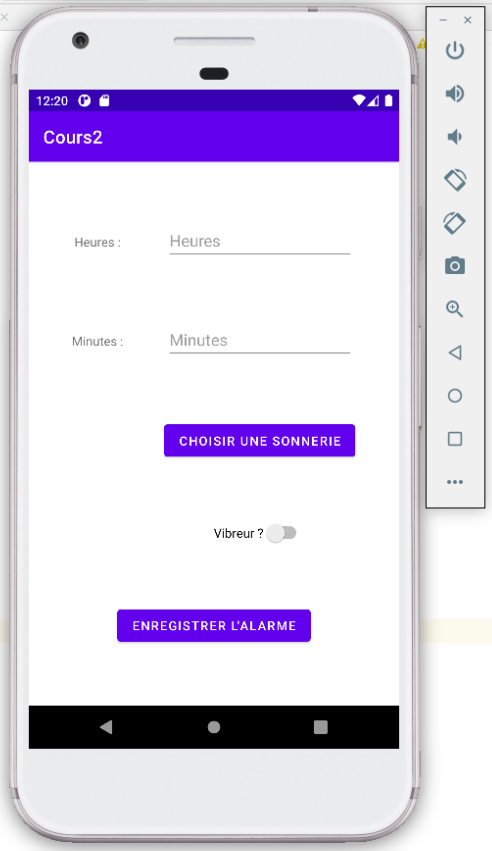
EditText hours

id	hours
Declared Attributes	
layout_width	wrap_content
layout_height	wrap_content
layout_constraintBottom_to...	@+id/minutes
layout_constraintHorizontal...	0.5
layout_constraintStart_toEn...	@+id/tHours
layout_constraintEnd_toEnd...	parent
layout_constraintTop_toTopOf	parent
ems	10
hint	@string/eHeures
id	hours
inputType	numberDecimal
Layout	
Constraint Widget	
Constraints (5)	
layout_width	wrap_content
layout_height	wrap_content
visibility	
visibility	
Transforms	
Common Attributes	

MainActivity code

Cours2 – MainActivity.java [Cours2.app]

```java
package com.example.cours2;

import ...

public class MainActivity extends AppCompatActivity {

    private EditText editHours, editMinutes;
    private Button buttonRingtone,buttonAdd;
    private Switch switchVibreur;

    public static final String
            NOTYET = "com.example.cours2.NOTYET",
            RINGTONE = "com.example.cours2.RINGTONE",
            DEFAULT = "com.example.cours2.DEFAULT",
            CHOSEN = "com.example.cours2.CHOSEN",
            NO = "com.example.cours2.NO";

    private String typeRingtone=NOTYET;
    private Uri ringtone;

    /*...*/
    private ActivityResultCallback<Intent> callback = new ActivityResultCallback<Intent>() {...};

    private ActivityResultContract<Void,Intent> contract = new ActivityResultContract<Void, Intent>() {...};

    //à lancer pour débuter l'activité Ringtone
    ActivityResultLauncher<Void> selectRingtone = registerForActivityResult(contract, callback);

    @Override
    protected void onCreate(Bundle savedInstanceState) {...}

    //on attrape les views déclarées dans le XML
    private void catchViews(){...}

    private void ringtoneIssue() {...}
    private void formatIssue() {...}
}
```



Launch succeeded (3 minutes ago)

registerForActivityResult()

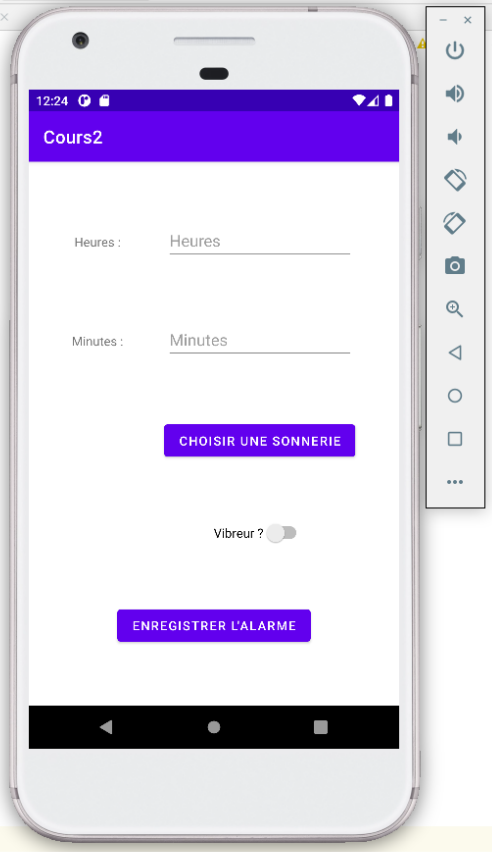
Cours2 – MainActivity.java [Cours2.app]

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › java › com › example › cours2 › MainActivity › selectRingtone

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```java
41      /*
42      /!\ IMPORTANT /!\
43      Le callback doit être déclaré dès la création de l'activité !
44      En effet, il est possible que l'activité appelante ait été détruite avant le retour l'acitivité appelée ;
45      il faut malgré tout que la nouvelle instance de l'activité appelante sache comment traiter le résutlat !
46       */
47      private ActivityResultCallback<Intent> callback = new ActivityResultCallback<Intent>() {
48          @Override
49          public void onActivityResult(Intent result) {
50              typeRingtone = result.getStringExtra(RINGTONE);
51
52              if(typeRingtone.equals(CHOSEN)){
53                  ringtone = result.getData();
54                  if(ringtone == null){
55                      //erreur durant la sélection
56                      typeRingtone = DEFAULT;
57                  }
58              }
59          }
60      };
61
62      private ActivityResultContract<Void,Intent> contract = new ActivityResultContract<Void, Intent>() {
63          @Override
64          public Intent createIntent(Context context, Void input) {
65              return new Intent(context, Ringtone.class);
66          }
67
68          @Override
69          public Intent parseResult(int resultCode, Intent intent) { return intent; }
72      };
73
74      //à lancer pour débuter l'activité Ringtone
75      ActivityResultLauncher<Void> selectRingtone = registerForActivityResult(contract, callback);
76
```



TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (8 minutes ago) 74:48 LF UTF-8 4 spaces

registerForActivityResult()

Paramétré par deux classes : `I` (input) et `O` (output)

```
public ActivityResultLauncher<I> registerForActivityResult
   (ActivityResultContract<I,O> contract,
    ActivityResultCallback<O> callback)
```

registerForActivityResult()

Paramétré par deux classes : `I` (input) et `O` (output)

```
public ActivityResultLauncher<I> registerForActivityResult
   (ActivityResultContract<I,O> contract,
    ActivityResultCallback<O> callback)
```

- `callback` : implémente l'interface `ActivityResultCallback<O>`

```
public void onActivityResult(O result)
```

registerForActivityResult()

Paramétré par deux classes : `I` (input) et `O` (output)

```
public ActivityResultLauncher<I> registerForActivityResult
   (ActivityResultContract<I,O> contract,
    ActivityResultCallback<O> callback)
```

- callback : implémente l'interface `ActivityResultCallback<O>`

```
public void onActivityResult(O result)
```

- contract : implémente l'interface `ActivityResultContract<I,O>`

```
public Intent createIntent(Context context, I input)
public O parseResult(int resultCode, Intent intent)
```

registerForActivityResult()

Paramétré par deux classes : `I` (input) et `O` (output)

```
public ActivityResultLauncher<I> registerForActivityResult
   (ActivityResultContract<I,O> contract,
    ActivityResultCallback<O> callback)
```

- `callback` : implémente l'interface `ActivityResultCallback<O>`

```
public void onActivityResult(O result)
```

- `contract` : implémente l'interface `ActivityResultContract<I,O>`

```
public Intent createIntent(Context context, I input)
public O parseResult(int resultCode, Intent intent)
```

- l'appel peut ensuite être fait via la méthode `launch(I input)` du résultat de `registerForActivityResult()`

registerForActivityResult()

Paramétré par deux classes : `I` (input) et `O` (output)

```
public ActivityResultLauncher<I> registerForActivityResult
    (ActivityResultContract<I,O> contract,
     ActivityResultCallback<O> callback)
```

- `callback` : implémente l'interface `ActivityResultCallback<O>`

```
public void onActivityResult(O result)
```

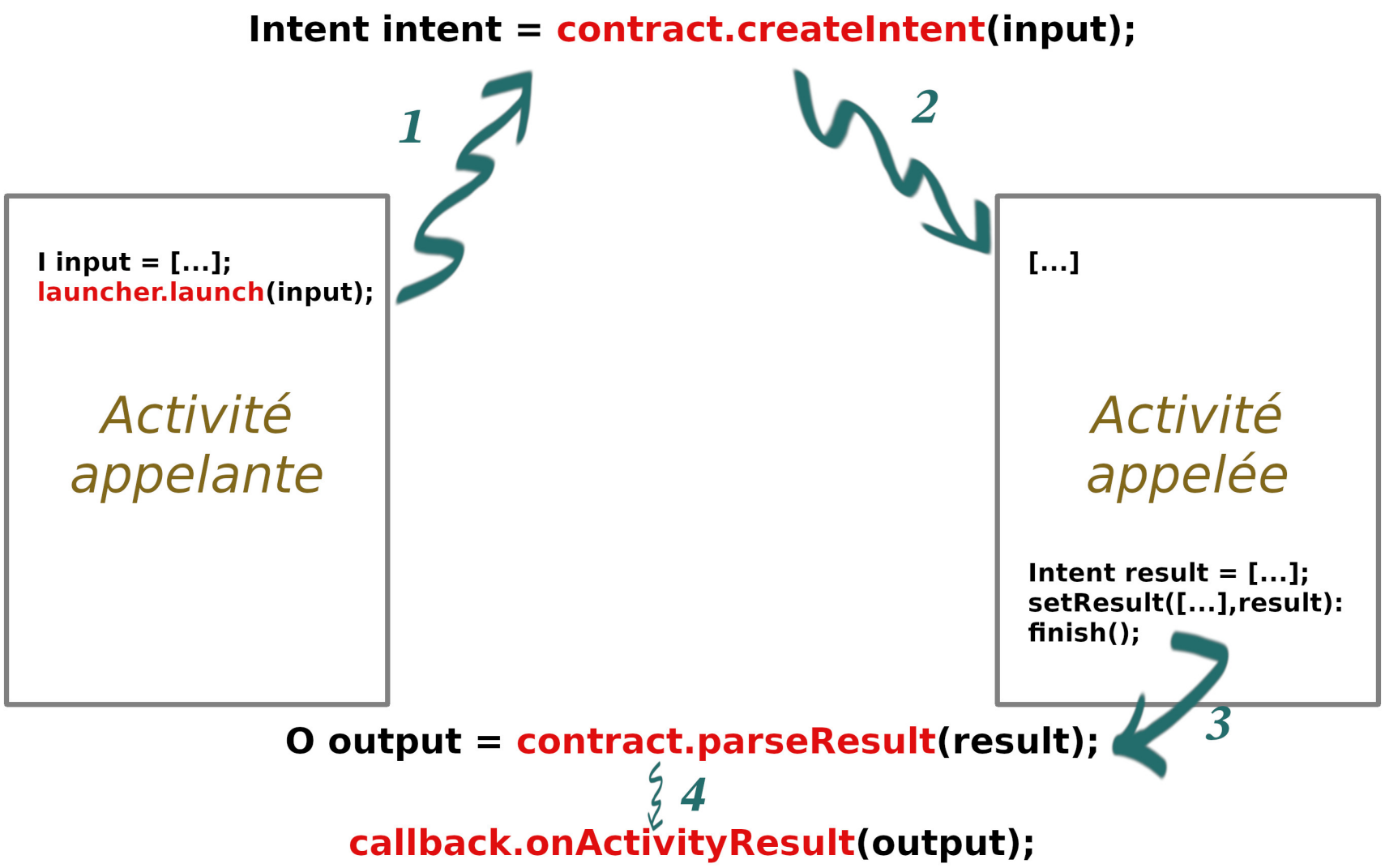
- `contract` : implémente l'interface `ActivityResultContract<I,O>`

```
public Intent createIntent(Context context, I input)
public O parseResult(int resultCode, Intent intent)
```

- l'appel peut ensuite être fait via la méthode `launch(I input)` du résultat de `registerForActivityResult()`

Le callback doit être défini dès la création de l'`Activity` appelante.

registerForActivityResult() : derrière la scène



registerForActivityResult()

Ici, $\boxed{\texttt{I}} = \boxed{\texttt{Void}}$ (aucun input) et $\boxed{\texttt{O}} = \boxed{\texttt{Intent}}$.

Cours2 – MainActivity.java [Cours2.app]

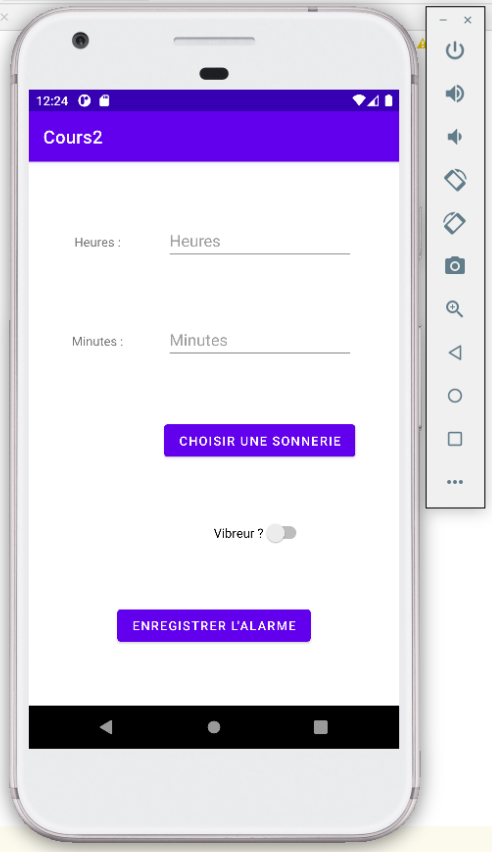
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › java › com › example › cours2 › MainActivity › selectRingtone

app | Pixel XL API 30

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```java
41      /*
42      /!\ IMPORTANT /!\
43      Le callback doit être déclaré dès la création de l'activité !
44      En effet, il est possible que l'activité appelante ait été détruite avant le retour l'acitivité appelée ;
45      il faut malgré tout que la nouvelle instance de l'activité appelante sache comment traiter le résutlat !
46       */
47      private ActivityResultCallback<Intent> callback = new ActivityResultCallback<Intent>() {
48          @Override
49          public void onActivityResult(Intent result) {
50              typeRingtone = result.getStringExtra(RINGTONE);
51
52              if(typeRingtone.equals(CHOSEN)){
53                  ringtone = result.getData();
54                  if(ringtone == null){
55                      //erreur durant la sélection
56                      typeRingtone = DEFAULT;
57                  }
58              }
59          }
60      };
61
62      private ActivityResultContract<Void,Intent> contract = new ActivityResultContract<Void, Intent>() {
63          @Override
64          public Intent createIntent(Context context, Void input) {
65              return new Intent(context, Ringtone.class);
66          }
67
68          @Override
69          public Intent parseResult(int resultCode, Intent intent) { return intent; }
72      };
73
74      //à lancer pour débuter l'activité Ringtone
75      ActivityResultLauncher<Void> selectRingtone = registerForActivityResult(contract, callback);
76
```



TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (8 minutes ago) 74:48 LF UTF-8 4 spaces

registerForActivityResult()

Cours2 – MainActivity.java [Cours2.app]

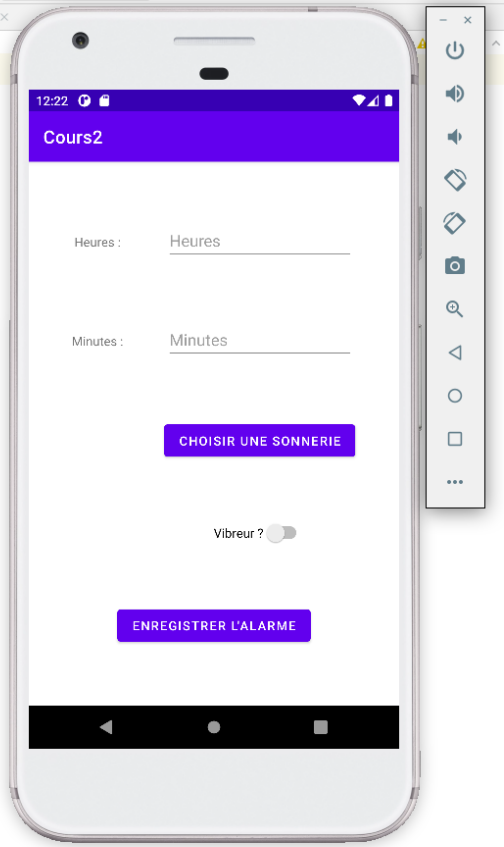
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › java › com › example › cours2 › MainActivity › selectRingtone

app | Pixel XL API 30

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```java
    //à lancer pour débuter l'activité Ringtone
    ActivityResultLauncher<Void> selectRingtone = registerForActivityResult(contract, callback);

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        catchViews();

        buttonRingtone.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) { selectRingtone.launch( input: null); }
        });

        buttonAdd.setOnClickListener(new View.OnClickListener() {...});

    }

    //on attrape les views déclarées dans le XML
    private void catchViews(){
        editHours = findViewById(R.id.hours);
        editMinutes = findViewById(R.id.minutes);
        buttonRingtone = findViewById(R.id.ringtone);
        switchVibreur = findViewById(R.id.vibreur);
        buttonAdd= findViewById(R.id.add);
    }
```



TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (6 minutes ago)

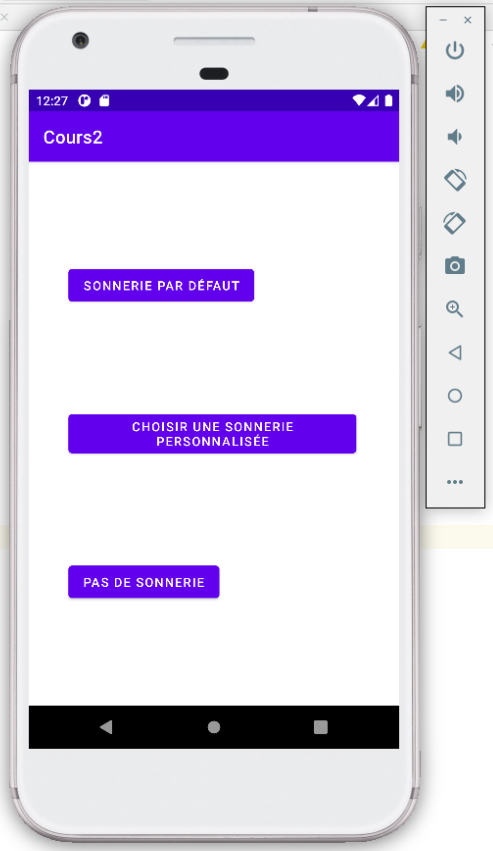
74:48 LF UTF-8 4 spaces

Ringtone

Ici, `I` = `String` (MIME type) et `O` = `Uri` (fichier audio).

Cours2 – Ringtone.java [Cours2.app]

```java
package com.example.cours2;

import ...

public class Ringtone extends AppCompatActivity {

    private Button buttonDefault, buttonChoose, buttonNo;

    private Intent result;
    private Uri ringtone;

    ActivityResultCallback<Uri> callback = new ActivityResultCallback<Uri>() {
        @Override
        public void onActivityResult(Uri result) { ringtone = result; }
    };

    //ActivityResultContracts.GetContent() est le contrat par défaut String (MIME type) -> Uri
    //on aurait aussi pu déclarer notre contrat à la main
    private ActivityResultLauncher<String> select = registerForActivityResult(new ActivityResultContracts.GetContent(),callback);

    @Override
    protected void onCreate(Bundle savedInstanceState) {...}

    private void sendRingtone(){...}
}
```



Ringtone

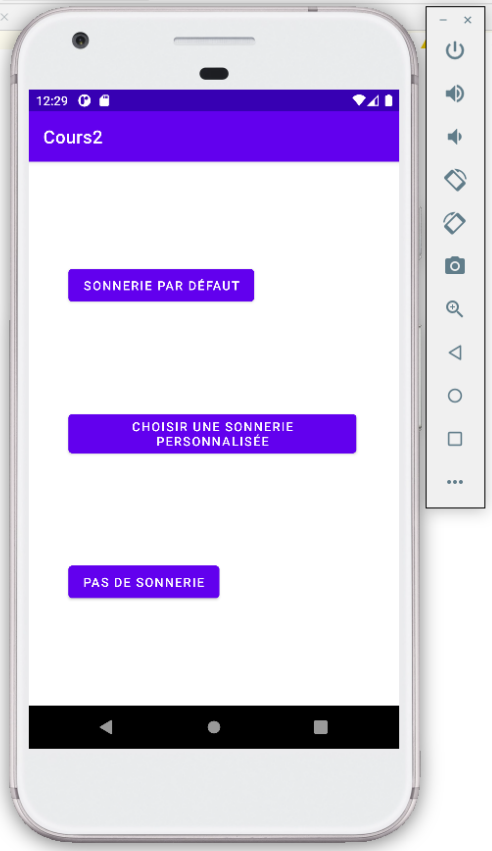
Cours2 – Ringtone.java [Cours2.app]

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › java › com › example › cours2 › Ringtone › onCreate › anonymous OnClickListener › onClick

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```java
35  protected void onCreate(Bundle savedInstanceState) {
36      super.onCreate(savedInstanceState);
37      setContentView(R.layout.activity_ringtone);
38
39      buttonDefault = findViewById(R.id.default_ringtone);
40      buttonChoose = findViewById(R.id.choose_ringtone);
41      buttonNo = findViewById(R.id.no_ringtone);
42
43      result = new Intent();
44
45      buttonDefault.setOnClickListener(new View.OnClickListener() {
46          @Override
47          public void onClick(View view) {
48              result.putExtra(MainActivity.RINGTONE,MainActivity.DEFAULT);
49              sendRingtone();
50          }
51      });
52
53      buttonChoose.setOnClickListener(new View.OnClickListener() {
54          @Override
55          public void onClick(View view) {
56              select.launch( input: "audio/*");
57              result.putExtra(MainActivity.RINGTONE,MainActivity.CHOSEN);
58              result.setData(ringtone);
59              sendRingtone();
60          }
61      });
62
63      buttonNo.setOnClickListener(new View.OnClickListener() {
64          @Override
65          public void onClick(View view) {
66              result.putExtra(MainActivity.RINGTONE,MainActivity.NO);
67              sendRingtone();
68          }
69      });
70  }
71
72  private void sendRingtone(){
73      setResult(Activity.RESULT_OK,result);
74      finish();
```



TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (12 minutes ago) 35:56 LF UTF-8 4 spaces

setResult()

Pour passer un résultat à l'`Activity` appelante :

```
Intent result = new Intent();
result.putExtra(...);
result.setData(data);

setResult(code, result);
finish();
```

où code est `Activity.RESULT_OK` ou `Activity.RESULT_CANCELED`.

MainActivity Enregistrement de l'alarme

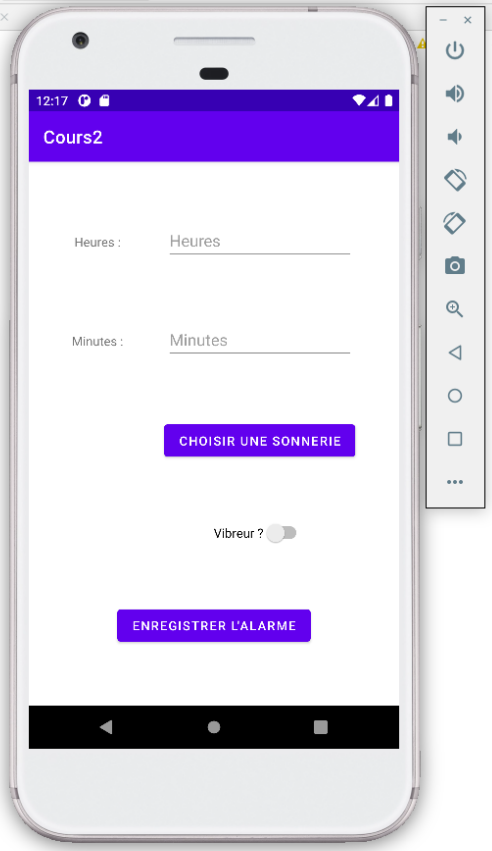
Cours2 – MainActivity.java [Cours2.app]

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › java › com › example › cours2 › MainActivity › selectRingtone

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```java
buttonAdd.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        int hours, minutes;
        try {
            hours = Integer.valueOf(String.valueOf(editHours.getText()));
            minutes = Integer.valueOf(String.valueOf(editMinutes.getText()));

            if(0 <= hours && 0 <= minutes && hours < 24 && minutes < 60){
                // l'heure est valide ; on lance l'alarme
                Intent setAlarm = new Intent(AlarmClock.ACTION_SET_ALARM);
                setAlarm.putExtra(AlarmClock.EXTRA_HOUR,Integer.valueOf(hours));
                setAlarm.putExtra(AlarmClock.EXTRA_MINUTES,Integer.valueOf(minutes));
                setAlarm.putExtra(AlarmClock.EXTRA_VIBRATE,switchVibreur.isChecked());
                switch (typeRingtone){
                    case DEFAULT:
                        //si pas de EXTRA_RINGTONE, la sonnerie par défaut est utilisée
                        startActivity(setAlarm);
                        break;
                    case CHOSEN:
                        setAlarm.putExtra(AlarmClock.EXTRA_RINGTONE,ringtone);
                        startActivity(setAlarm);
                        break;
                    case NO:
                        setAlarm.putExtra(AlarmClock.EXTRA_RINGTONE,AlarmClock.VALUE_RINGTONE_SILENT);
                        startActivity(setAlarm);
                        break;
                    default:
                        ringtoneIssue();
                }
            } else {
                formatIssue();
            }
        } catch(NumberFormatException e) {
            formatIssue();
        }

    }
});
```



TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (moments ago) 74:48 LF UTF-8 4 spaces

Permissions

On demande la permission *"com.android.alarm.permission.SET_ALARM"*.

Cours2 – AndroidManifest.xml [Cours2.app]

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

Cours2 › app › src › main › AndroidManifest.xml

app | Pixel XL API 30

strings.xml | activity_main.xml | MainActivity.java | activity_ringtone.xml | Ringtone.java | AndroidManifest.xml | build.gradle (Cours2) | build.gradle (:app)

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.cours2">
    <uses-permission android:name="com.android.alarm.permission.SET_ALARM"/>

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="Cours2"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Cours2">
        <activity
            android:name=".Ringtone"
            android:exported="true" />
        <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>
    </application>

</manifest>
```

manifest › uses-permission

Text | Merged Manifest

TODO | Problems | Terminal | Logcat | Build | Profiler | Run | App Inspection | Event Log | Layout Inspector

Launch succeeded (10 minutes ago) 4:77 LF UTF-8 4 spaces

Signaler qu'on sait traiter un `Intent` implicite

Pour déclarer qu'on sait envoyer des images par mail, ajouter dans le Android Manifest :

```
<activity android:name="MyMailer">
    <intent-filter>
        <action android:name="android.intent.action.SEND"/>
        <category android:name="android.intent.category.DEFAULT"/>
        <data android:mimeType="image/*"/>
    </intent-filter>
</activity>
```