

Android: Basics on development

Desenvolvimento de Software e Sistemas Móveis (DSSMV)

Licenciatura em Engenharia de Telecomunicações e Informática

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Disclaimer

Material and Slides

Some of the material/slides are adapted from various:

- Presentations found on the internet;
- Books;
- Web sites;
- ...

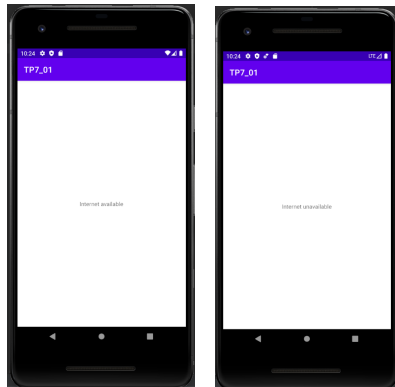
Outline

- 1 Connectivity
- 2 Location
- 3 Sensors
- 4 Service
- 5 ResultReceiver
- 6 BroadcastReceiver
- 8 Bibliography

Connectivity

Connectivity

- Detecting Internet connection (Wifi or Cellular)

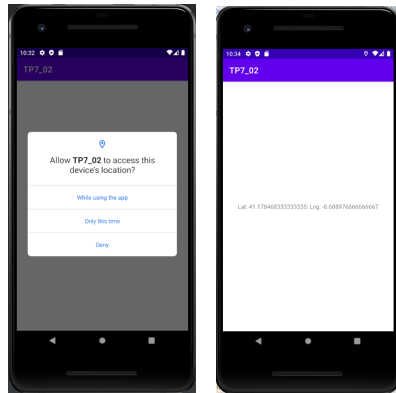


Check: TP7_01.zip

Location

Location

- Detecting device location

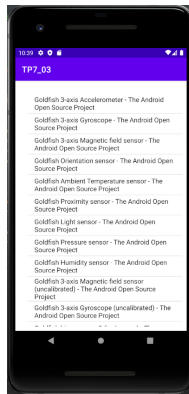


Check: TP7_02.zip

Sensors

Sensors (I)

- List device sensors



Check: TP7_03.zip

Sensors (II)

- Getting data from device sensors

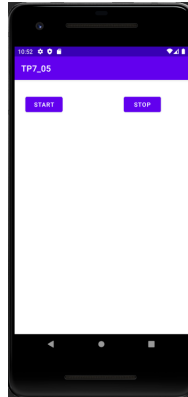


Check: TP7_04.zip

Service

Started Service (I)

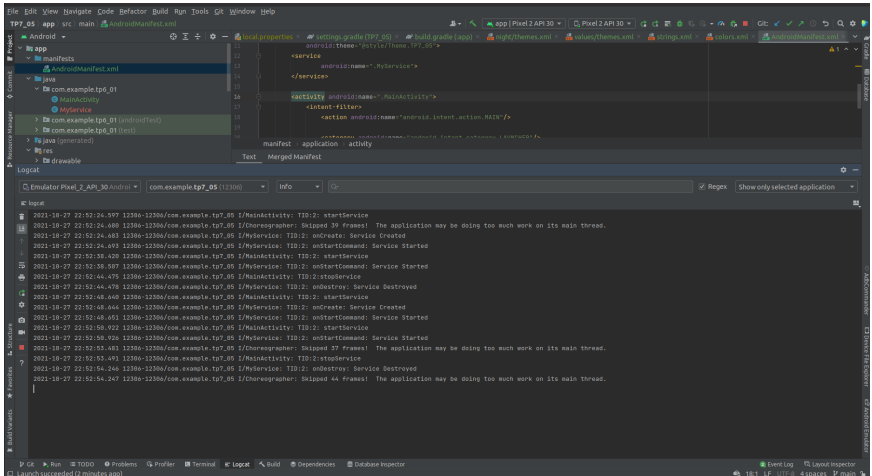
- Service is executed by main thread.



Check: TP7_05.zip

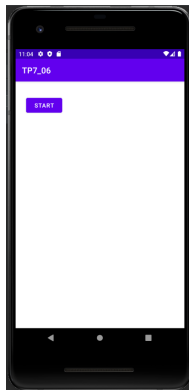
Started Service (II)

● Checking Logcat messages



Started Service (III)

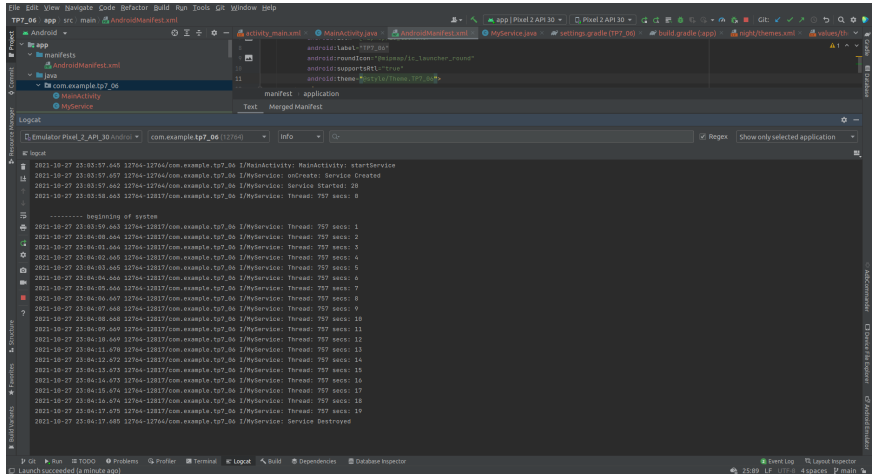
- Service is executed by worker thread.



Check: TP7_06.zip

Started Service (IV)

● Checking Logcat messages



Bound Service (I)

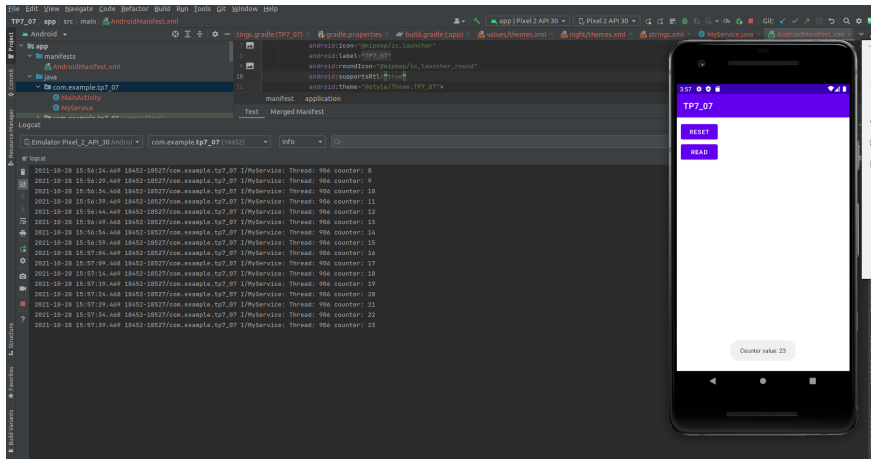
- Bound Service is executed by worker thread.



Check: TP7_07.zip

Bound Service (IV)

- Checking Logcat messages.
- Reading the current Service `counter` variable value.



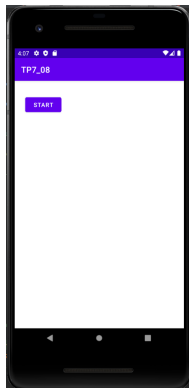
ResultReceiver

ResultReceiver (I)

- In the Activity
 - Create a `Handler` object;
 - Create a `ResultReceiver` object using `Handler` object.
 - Override `onReceiveResult` method.
 - Pass the `ResultReceiver` object as an `Intent` extra.
- In the Service
 - Get the `ResultReceiver` object from intent
 - Create a `Bundle` with data.
 - Invoke `ResultReceiver` `send` method.
- In the Activity
 - The `onReceiveResult` method will be automatically invoked.

ResultReceiver (II)

- Started Service is executed by worker thread.
- Started Service is returning data to Activity through ResultReceiver.



Check: TP7_08.zip

ResultReceiver (III)

● Checking Logcat messages.

The screenshot shows the Android Studio IDE with the following components:

- Project Explorer:** Shows the project structure for 'TP7_08' with folders for 'app', 'res', and 'Gradle Scripts'. The 'app' folder contains 'manifests', 'java', and 'res' subfolders. The 'java' folder contains 'com.example.tp7_08' which includes 'MainActivity' and 'MyService'.
- MainActivity.java:** The code in this file is as follows:


```

14: protected void onCreate(Bundle savedInstanceState) {
15:     super.onCreate(savedInstanceState);
16:     setContentView(R.layout.activity_main);
17:     setContentView(R.layout.activity_main);
18:     Button b1 = (Button) findViewById(R.id.button);
19:     b1.setOnClickListener(new View.OnClickListener() {
20:         @Override
21:         public void onClick(View arg0) {
22:             // TODO Auto-generated method stub
23:             Toast.makeText(getApplicationContext(), "MainActivity: startService", Toast.LENGTH_SHORT).show();
24:             Log.i(TAG, "MainActivity: startService");
25:             Intent intent = new Intent(getApplicationContext(), MainActivity.this, MyService.class);
26:             intent.putExtra("EXTRA_TIME_SEC", 10);
27:             intent.putExtra("EXTRA_RECEIVER", receiver);
28:         }
29:     });
30: }

```
- Logcat:** The Logcat window shows the following messages:


```

2021-10-28 16:08:01.559 18874-18874/com.example.tp7_08 I/MainActivity: MainActivity: startService
2021-10-28 16:08:01.562 18874-18874/com.example.tp7_08 I/MyService: onCreate: Service Created
2021-10-28 16:08:01.576 18874-18874/com.example.tp7_08 I/MyService: Service Started: 10
2021-10-28 16:08:02.577 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 0
..... beginning of system
2021-10-28 16:08:03.577 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 1
2021-10-28 16:08:04.577 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 2
2021-10-28 16:08:05.578 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 3
2021-10-28 16:08:06.578 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 4
2021-10-28 16:08:07.579 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 5
2021-10-28 16:08:08.579 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 6
2021-10-28 16:08:09.579 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 7
2021-10-28 16:08:10.580 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 8
2021-10-28 16:08:11.580 18874-18874/com.example.tp7_08 I/MyService: Thread: V13 secs: 9
2021-10-28 16:08:11.581 18874-18874/com.example.tp7_08 I/MainActivity: *****RESULT_OK***** [Message from MyService]
2021-10-28 16:08:11.589 18874-18874/com.example.tp7_08 I/MyService: Service Destroyed

```

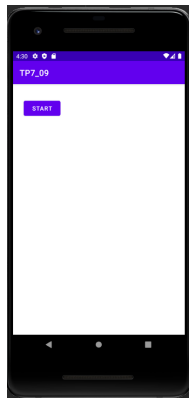
BroadcastReceiver

BroadcastReceiver (I)

- In the Activity
 - Create a `BroadcastReceiver` object
 - Override `onReceive` method.
 - Create a string to name an `Action`
 - Create an `IntentFilter` with the `Action`.
 - Register **BroadcastReceiver**
- In the Service
 - Create an `Intent` object with data and `Action`
 - Invoke `sendBroadcast` method
- In the Activity
 - The `onReceive` method will be automatically invoked.

BroadcastReceiver (II)

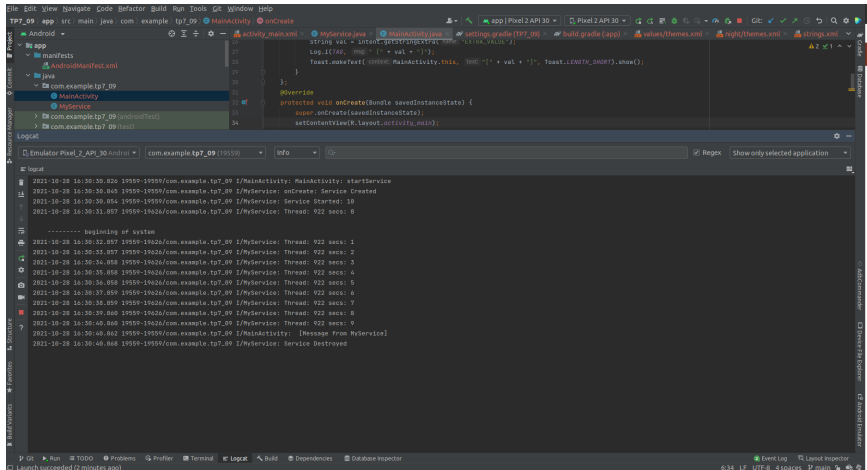
- Started Service is executed by worker thread.
- Started Service is returning data to Activity through `BroadcastReceiver`.



Check: TP7_08.zip

BroadcastReceiver (III)

- Checking Logcat messages.



Bibliography

Resources

- "Mastering Android Application Development", by Antonio Pachon Rui, 2015
- <https://developer.android.com/index.html>
- <http://simple.sourceforge.net/home.php>
<http://simple.sourceforge.net/download/stream/doc/tutorial/tutorial.php>