

IoT Programming with Basic for Android



B4A 101
June 5, 2017
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IoT Programming with Basic for Android

AGENDA

- **B4A Bricks**
- **B4A Coding Mechanics**
- **Ringling The Phone With B4A**
- **Day 1 Summary**



IoT Programming with Basic for Android

B4A Bricks – Android SDK/Java DK

B4A

Android SDK Manager

Packages Tools

SDK Path: C:\Android

Packages

Name

- Tools
- Android SDK Tools
- Android SDK Platform-tools
- Android SDK Build-tools
- Android SDK Build-tools
- Android SDK Build-tools
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Java SE Development Kit 8u131

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

Accept License Agreement Decline License Agreement

Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	77.87 MB	jdk-8u131-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	74.81 MB	jdk-8u131-linux-arm64-vfp-hflt.tar.gz
Linux x86	164.66 MB	jdk-8u131-linux-i586.rpm
Linux x86	179.39 MB	jdk-8u131-linux-i586.tar.gz
Linux x64	162.11 MB	jdk-8u131-linux-x64.rpm
Linux x64	176.95 MB	jdk-8u131-linux-x64.tar.gz
Mac OS X	226.57 MB	jdk-8u131-macosx-x64.dmg
Solaris SPARC 64-bit	139.79 MB	jdk-8u131-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	99.13 MB	jdk-8u131-solaris-sparcv9.tar.gz
Solaris x64	140.51 MB	jdk-8u131-solaris-x64.tar.Z
Solaris x64	96.96 MB	jdk-8u131-solaris-x64.tar.gz
Windows x86	191.22 MB	jdk-8u131-windows-i586.exe
Windows x64	198.03 MB	jdk-8u131-windows-x64.exe

Show: Updates/New Installed Select [New](#) or [Updates](#)

Obsolete [Deselect All](#)

Install packages...

Delete packages...

Done loading packages.



IoT Programming with Basic for Android

B4A Bricks – Process Life Cycle

B4A

- A Process Begins When The User Starts the Application
- Each B4A Program Runs In Its Own Process
- Each Process Has One Main Thread Named UI
- A Process Supports Multiple Threads Running Background Tasks
- UI Thread Dies When The Process Ends

```
BLE - B4A
File Edit Designer Project Tools Debug Windows Help
Main Starter BeaconParser StartAtBoot
1 #Region Project Attributes
2   #ApplicationLabel: Temperature Alarm
3   #VersionCode: 1
4   #VersionName:
5   'SupportedOrientations possible values: unspecified, landscape or portrait.
6   #SupportedOrientations: portrait
7   #CanInstallToExternalStorage: False
8 #End Region
9
10 #Region Activity Attributes
11   #FullScreen: False
12   #IncludeTitle: True
13 #End Region
14
15 #Sub Process_Globals
16   End Sub
17
18 #Sub Globals
19   Private btnDisconnect As Button
20   Private btnScan As Button
21   Private lblState As Label
22   Private lblSensorFound As Label
23   Private pbScan As ProgressBar
24   Private uiitemas As Map
25
26   Private lblAlarm As Label
27   Private btnExit As Button
28   End Sub
29
30 #Sub Activity_Create(FirstTime As Boolean)
31   Activity.LoadLayout("1")
32   uiitemas.Initialize
33   End Sub
34
35
36 #Sub Activity_Resume
37   StateChanged
38   End Sub
```



IoT Programming with Basic for Android

B4A Bricks – Activity Life Cycle

B4A

- B4A Programs Are Made Of One Or More Activities
- Activities Not In The Foreground Can Be Killed To Preserve Memory
- Configuration Changes Can Kill An Activity (Device Rotation)



BLE2

List of types:

[BleManager2](#)

BleManager2

This library replaces the BLE library. It allows you to search for and connect to BLE devices. It is supported by Android 4.3+ (API 18).

Permissions:

android.permission.BLUETOOTH
android.permission.BLUETOOTH_ADMIN

Events:

StateChanged (State As Int)
DeviceFound (Name As String, Deviceld As String, AdvertisingData As Map, RSSI As Double)
Disconnected
Connected (Services As List)
DataAvailable (ServiceId As String, Characteristics As Map)
WriteComplete (Characteristic As String, Status As Int)
RssiAvailable (Success As Boolean, RSSI As Double)

Members:

- ⊕ [Connect](#) (Deviceld As String)
- ⊕ [Connect2](#) (Deviceld As String, AutoConnect As Boolean)
- ⊕ [Disconnect](#)

Libraries

ABExtDrawing - v1.10 - Written by Alain Bailleul
ABZxing - v1.00 - Written by Alain Bailleul
AcceleratedSurface - v1.11 - Written by F. Leneuf-Magaud
Accessibility - v1.00
ActivityRecognition - v2.10
Administrator - v1.00
AActionBar - v1.00 - Written by Markus Stipp
ahaTranslate - v1.30 - Written by aha!dev
BitmapPlus - v1.11 - Written by Frederic Leneuf-Magaud
BLE2 - v1.35
BottomNavigation - v1.00 - Written by DonManfred (wrap)
BroadcastReceiver - v1.00 - Written by XverhelstX
ByteConverter - v1.10

IoT Programming with Basic for Android

B4A Coding Mechanics – Forum/Documentation

B4A

The screenshot shows the B4A forum website interface. At the top, there is a navigation bar with the logo 'Anywhere Software' and links for HOME, B4A, B4i, B4J, B4R, STORE, SHOWCASE, and COMMUNITY. A search bar contains the text 'BLE'. Below the navigation bar, there are tabs for Forums, Members, Community Map, and Chat Room, along with a 'Log in or Sign up' button. The main content area shows a breadcrumb trail: Home > Forums > B4A -Development tool for native Android apps. Below this, there is a search filter section with 'Query: BLE' and dropdown menus for 'All products', 'Any time', 'Any prefix', and 'Author'. A search result is displayed for 'B4A Library BLE 2 - Bluetooth Low Energy - Erel', dated Nov 2, 2015, with 20 likes. The description states: 'This library replaces the previous BLE library. It is simpler to use and it is more powerful. Its API is based on B4i iBLE library which makes it easy to reuse B4i code. See the iBLE tutorial: http... link: Please start a new thread for this question.... link: Hi All! How can I send a AdvertisingData message without a connection?... link: https://www.b4x.com/android/forum/threads/ble-write-data.63916/#post-404299...'

- **B4A Beginner's Guide and Code Snippets**
- **B4A User's Guide**
- **Tutorials Forum**
- **Additional Libraries Forum**



IoT Programming with Basic for Android

B4A Coding Mechanics – Starter Service

B4A

```
A B4A
File Edit Designer Project Tools Debug Windows Help
Main Starter X
1 #Region Service Attributes
5
6 Sub Process_Globals
7     'These global variables will be declared once when the application starts.
8     'These variables can be accessed from all modules.
9
10 End Sub
11
12 Sub Service_Create
13     'This is the program entry point.
14     'This is a good place to load resources that are not specific to a single activity.
15
16 End Sub
17
18 Sub Service_Start (StartingIntent As Intent)
19
20 End Sub
21
22 Sub Service_TaskRemoved
23     'This event will be raised when the user removes the app from the recent apps list.
24 End Sub
25
26 'Return true to allow the OS default exceptions handler to handle the uncaught exception.
27 Sub Application_Error (Error As Exception, StackTrace As String) As Boolean
28     Return True
29 End Sub
30
31 Sub Service_Destroy
32
33 End Sub
34
```


IoT Programming with Basic for Android

B4A Coding Mechanics – Main Activity

B4A

```
A B4A
File Edit Designer Project Tools Debug Windows Help
Main x Starter
1 #Region Project Attributes
9
10 #Region Activity Attributes
14
15 Sub Process_Globals
16     'These global variables will be declared once when the application starts.
17     'These variables can be accessed from all modules.
18
19 End Sub
20
21 Sub Globals
22     'These global variables will be redeclared each time the activity is created.
23     'These variables can only be accessed from this module.
24
25 End Sub
26
27 Sub Activity_Create(FirstTime As Boolean)
28     'Do not forget to load the layout file created with the visual designer. For example:
29     'Activity.LoadLayout("Layout1")
30
31 End Sub
32
33 Sub Activity_Resume
34
35 End Sub
36
37 Sub Activity_Pause (UserClosed As Boolean)
38
39 End Sub
40
```

IoT Programming with Basic for Android

B4A Coding Mechanics – Main Activity (Globals)

B4A

```
bricks1 - B4A
File Edit Designer Project Tools Debug Windows Help
Main x Starter
Process_Globals
1 #Region Project Attributes
9
10 #Region Activity Attributes
14 Sub Process_Globals
15 'This is where we declare all Private variables and objects for the Main module.
16 'These global variables will be declared once when the application starts.
17 'These variables can be accessed from all modules.
18 'In any Activity, Process_Globals and Globals should be used to declare variables.
19 End Sub
20
21 Sub Globals
22 'Here we declare all Private variables for the given Activity.
23 'These global variables will be redeclared each time the activity is created.
24 'These variables can only be accessed from this module.
25
26 End Sub
```

IoT Programming with Basic for Android

B4A Coding Mechanics – Main Activity

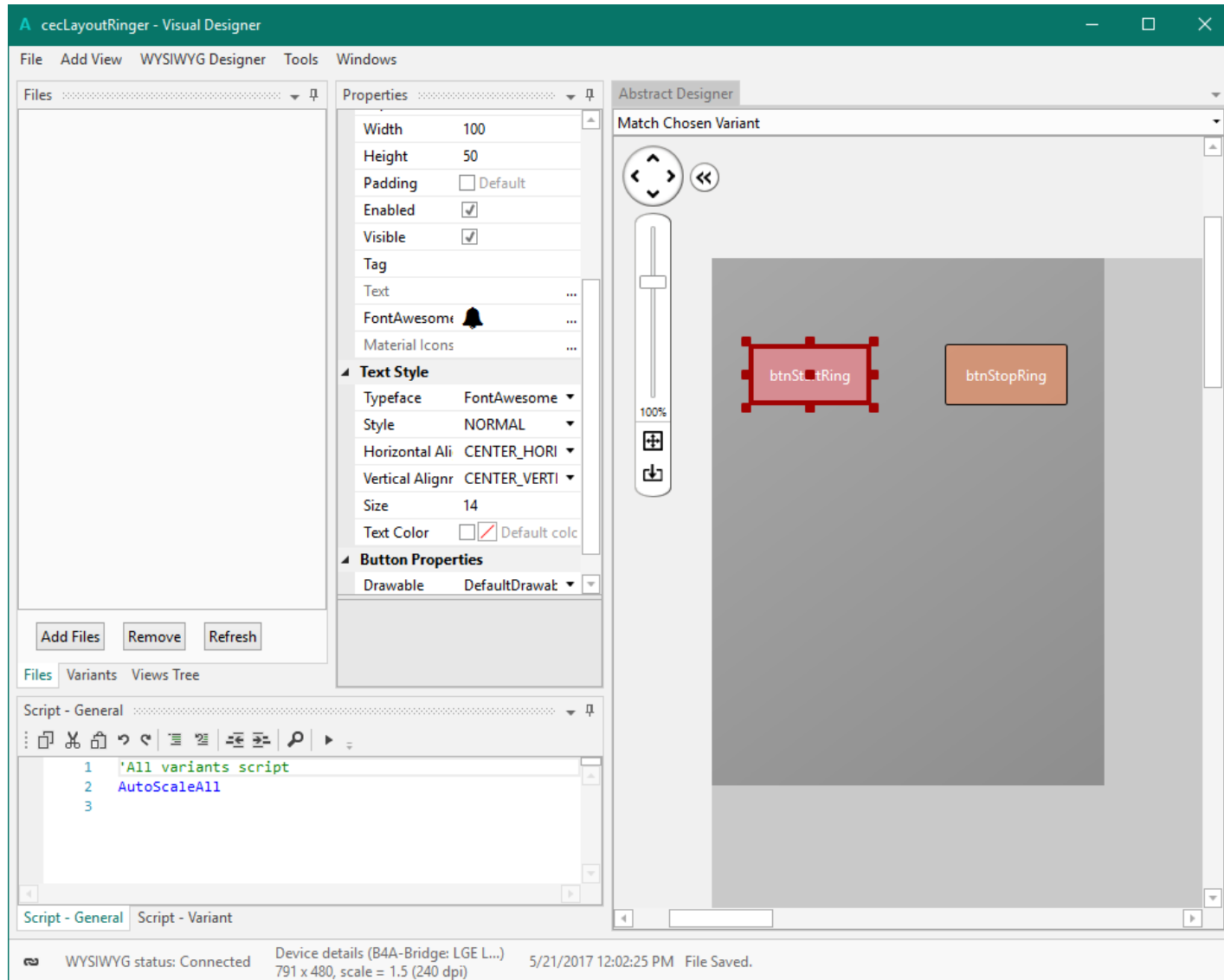
B4A

```
28 Sub Activity_Create(FirstTime As Boolean)
29     'This sub is called when the activity is created.
30     'The Activity Is created
31     '- when the user first launches the Application
32     '- the device configuration has changed (user rotated the device) and the Activity was destroyed
33     '- when the Activity was in the background and the OS decided to destroy it in order to free memory.
34     'The primary purpose of this sub is to load or create the layout (among other uses).
35     'Here we load layouts and initialize activity objects added by code.
36     'Do not forget to load the layout file created with the visual designer. For example:
37     'Activity.LoadLayout("Layout1")
38
39 End Sub
40
41 Sub Activity_Resume
42     'This routine is run every time the activity changes its state.
43 End Sub
44
45 Sub Activity_Pause (UserClosed As Boolean)
46     'This routine is run when the Activity is paused, like orientation change, launch of another activity etc.
47     'Activity_Pause is called every time the activity moves from the foreground to the background.
48     'This can happen because:
49     '1. A different Activity was started.
50     '2. The Home button was pressed.
51     '3. A configuration changed event was raised (orientation changed For example).
52     '4. The Back button was pressed.
53 End Sub
```

IoT Programming with Basic for Android

Ringling The Phone With B4A – Designer

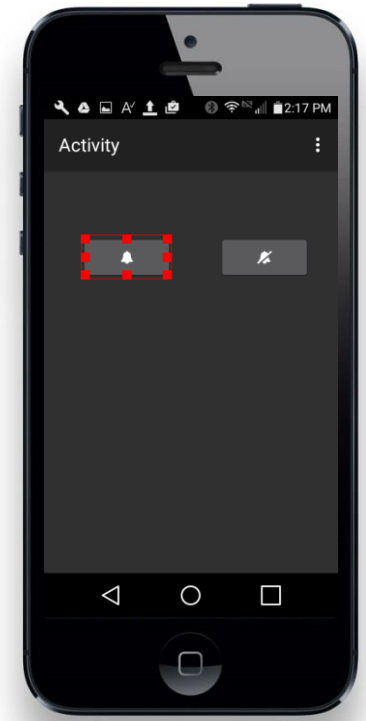
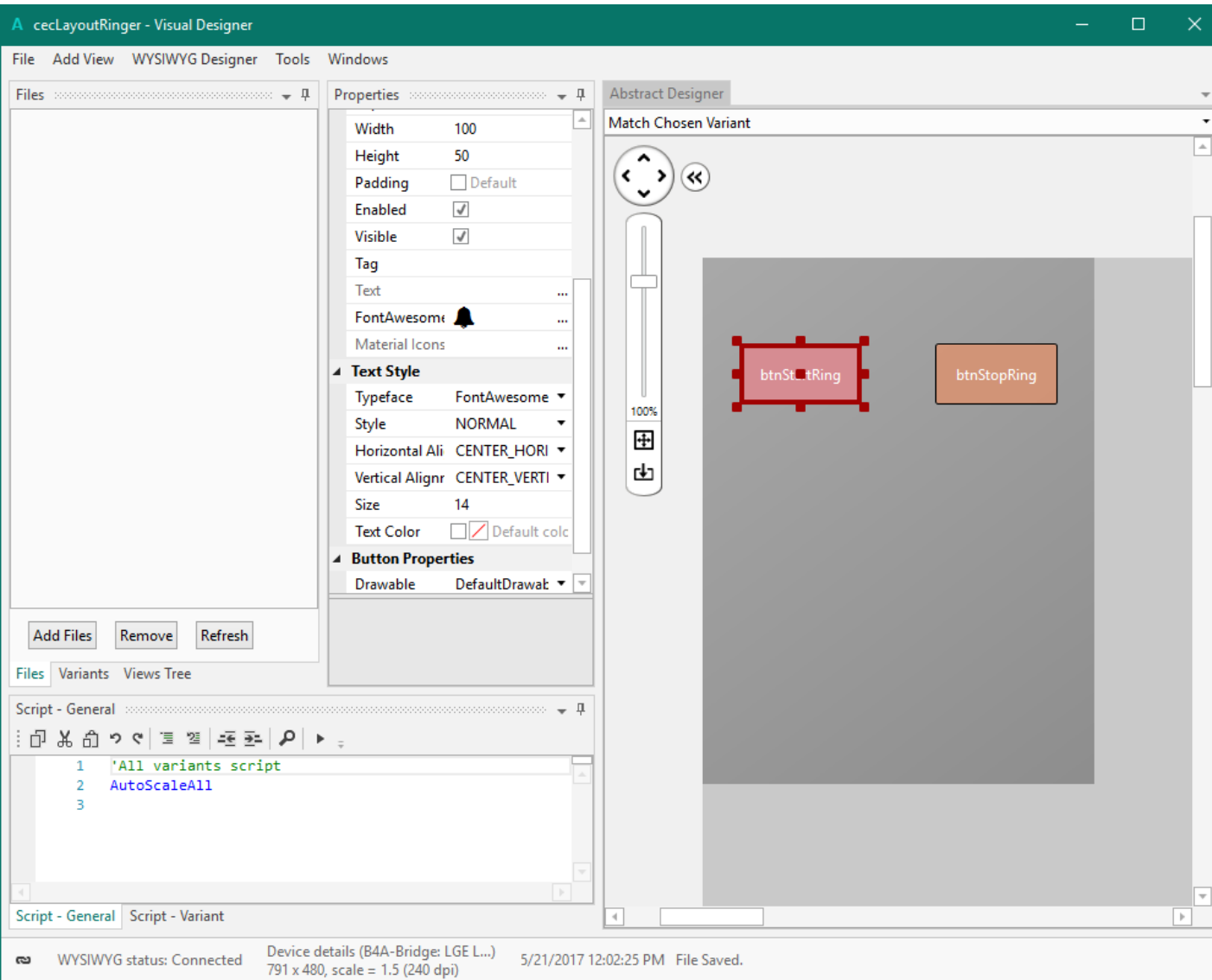
B4A



IoT Programming with Basic for Android

Ringling The Phone With B4A – Designer

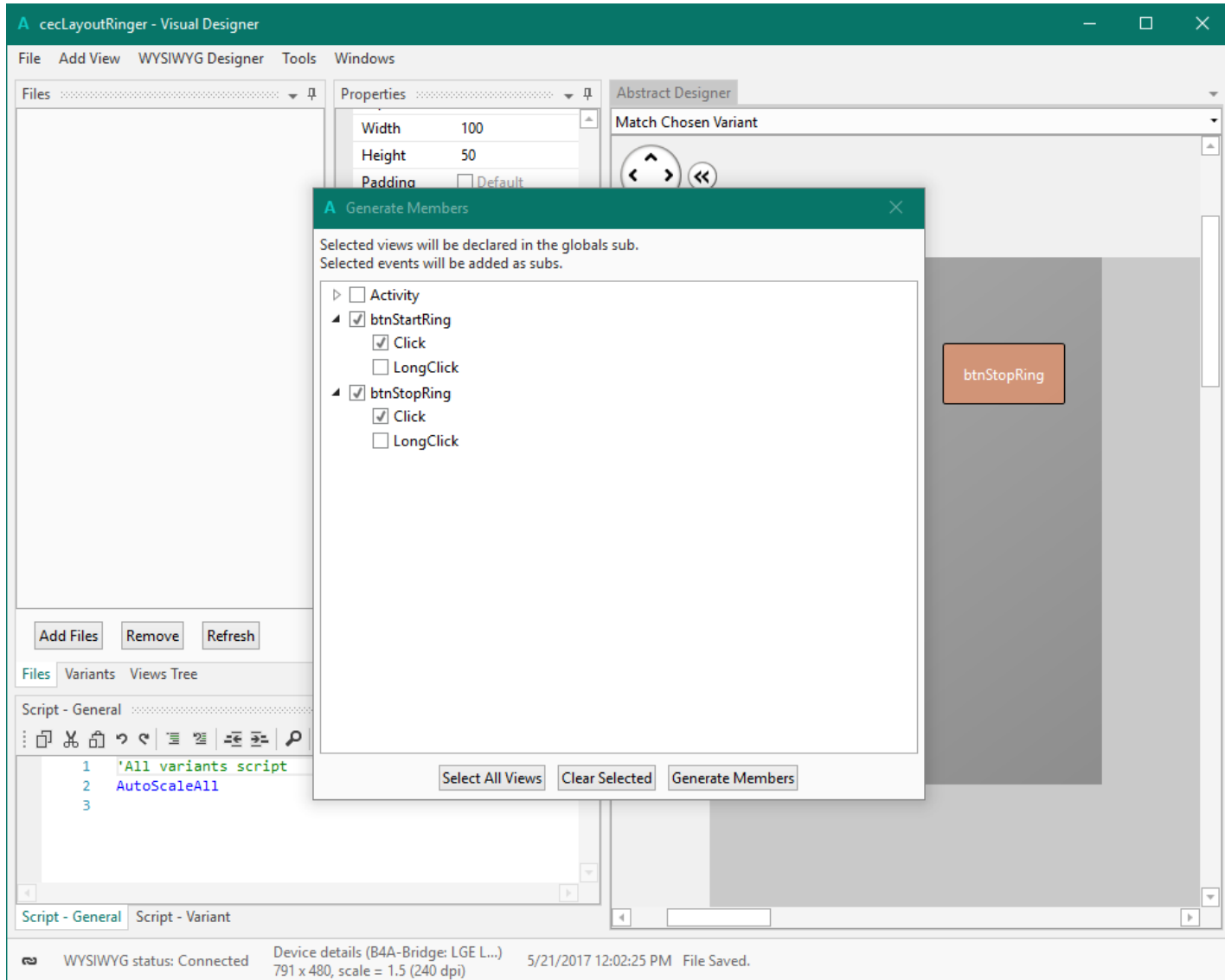
B4A



IoT Programming with Basic for Android

Ringling The Phone With B4A – Designer

B4A



Presented by:

IoT Programming with Basic for Android

Ringling The Phone With B4A – Starter Module

B4A

```
cecRinger - B4A
File Edit Designer Project Tools Debug Windows Help
Main Starter X
Timer1_Tick
1 #Region Service Attributes
5
6 Sub Process_Globals
7     'These global variables will be declared once when the application starts.
8     'These variables can be accessed from all modules.
9     Public phoneVibrator As PhoneVibrate
10    Public rm As RingtoneManager
11    Public mp As MediaPlayer
12    Public ringFlag As Boolean
13    Private Timer1 As Timer
14 End Sub
15
16 Sub Service_Create
17     'This is the program entry point.
18     'This is a good place to load resources that are not specific to a single activity.
19     mp.Initialize
20     ringFlag = False
21     Timer1.Initialize("timer1",20000)
22     Timer1.Enabled = True
23 End Sub
24
25 Sub Service_Start (StartingIntent As Intent)
26
27 End Sub
28
29 Sub Service_TaskRemoved
30     'This event will be raised when the user removes the app from the recent apps list.
31 End Sub
```

IoT Programming with Basic for Android

Ringling The Phone With B4A – Starter Module

B4A

```
33 Sub PlayRingtone(url As String)
34   Dim jo As JavaObject
35   jo.InitializeStatic("android.media.RingtoneManager")
36   Dim jo2 As JavaObject
37   jo2.InitializeContext
38   Dim u As Uri
39   u.Parse(url)
40   jo.RunMethodJO("getRingtone", Array(jo2, u)).RunMethod("play", Null)
41 End Sub
42
43 Sub Timer1_Tick
44   If ringFlag = True Then
45     phoneVibrator.Vibrate(1000)
46     'PlayRingtone(Starter.rm.GetDefault(Starter.rm.TYPE_NOTIFICATION))
47     'PlayRingtone(Starter.rm.GetDefault(Starter.rm.TYPE_RINGTONE))
48     PlayRingtone(rm.GetDefault(rm.TYPE_ALARM))
49
50   End If
51 End Sub
52
53 'Return true to allow the OS default exceptions handler to handle the uncaught exception.
54 Sub Application_Error (Error As Exception, StackTrace As String) As Boolean
55   Return True
56 End Sub
```


IoT Programming with Basic for Android

Ringling The Phone With B4A – Main Activity

B4A

```

A cecRinger - B4A
File Edit Designer Project Tools Debug Windows Help
Main x Starter
Activity_Pause
1 #Region Project Attributes
9
10 #Region Activity Attributes
14
15 Sub Process_Globals
16 'These global variables will be declared once when the application starts.
17 'These variables can be accessed from all modules.
18 End Sub
19
20 Sub Globals
21 'These global variables will be redeclared each time the activity is created.
22 'These variables can only be accessed from this module.
23 Private btnStartRing As Button
24 Private btnStopRing As Button
25 End Sub
26
27 Sub Activity_Create(FirstTime As Boolean)
28 'Do not forget to load the layout file created with the visual designer. For example:
29 Activity.LoadLayout("cecLayoutRinger")
30 End Sub
31
32 Sub Activity_Resume
33
34 End Sub
35
36 Sub Activity_Pause (UserClosed As Boolean)
37
38 End Sub

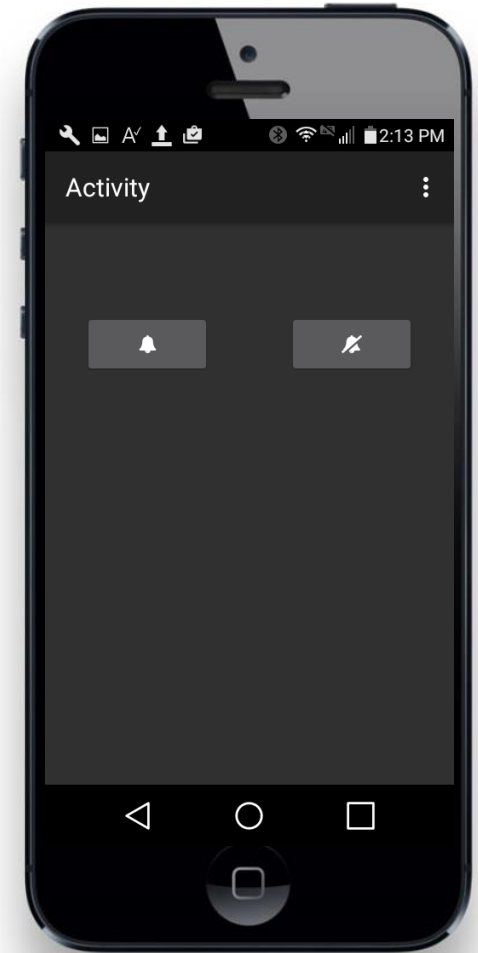
```

IoT Programming with Basic for Android

Ringling The Phone With B4A – Main Activity

B4A

```
40 Sub btnStopRing_Click
41     Starter.ringFlag = False
42 End Sub
43
44 Sub btnStartRing_Click
45     Starter.ringFlag = True
46 End Sub
47
```



IoT Programming with Basic for Android

Day 1 Summary

- Examined the Brick and Mortar Behind B4A Programming
- Created Code to Ring an Android Smart Phone

B4A