

A03 Android Studio

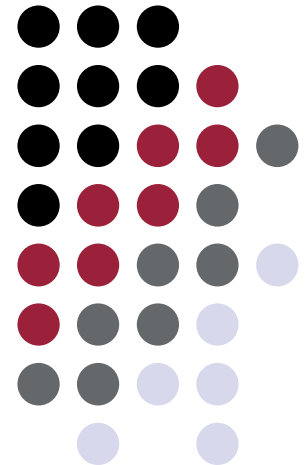


UFOP

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de Ouro Preto

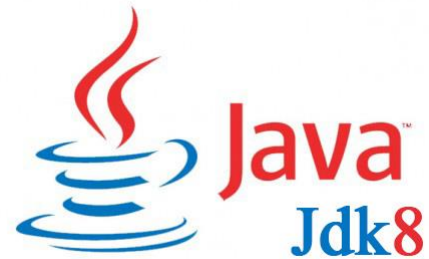
CSI401 – Programação para Dispositivos Móveis

Prof. Dr. George H. G. Fonseca
Universidade Federal de Ouro Preto

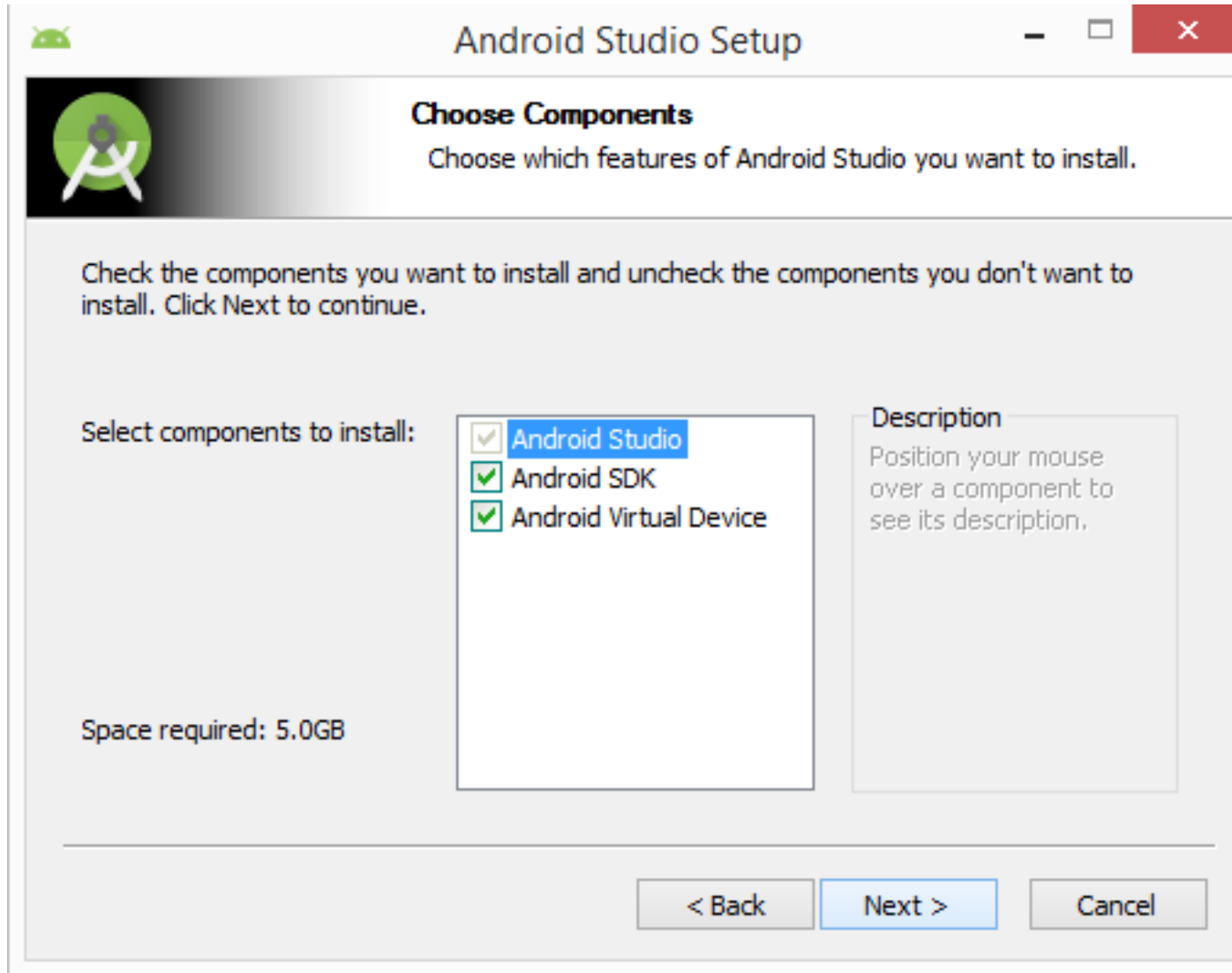




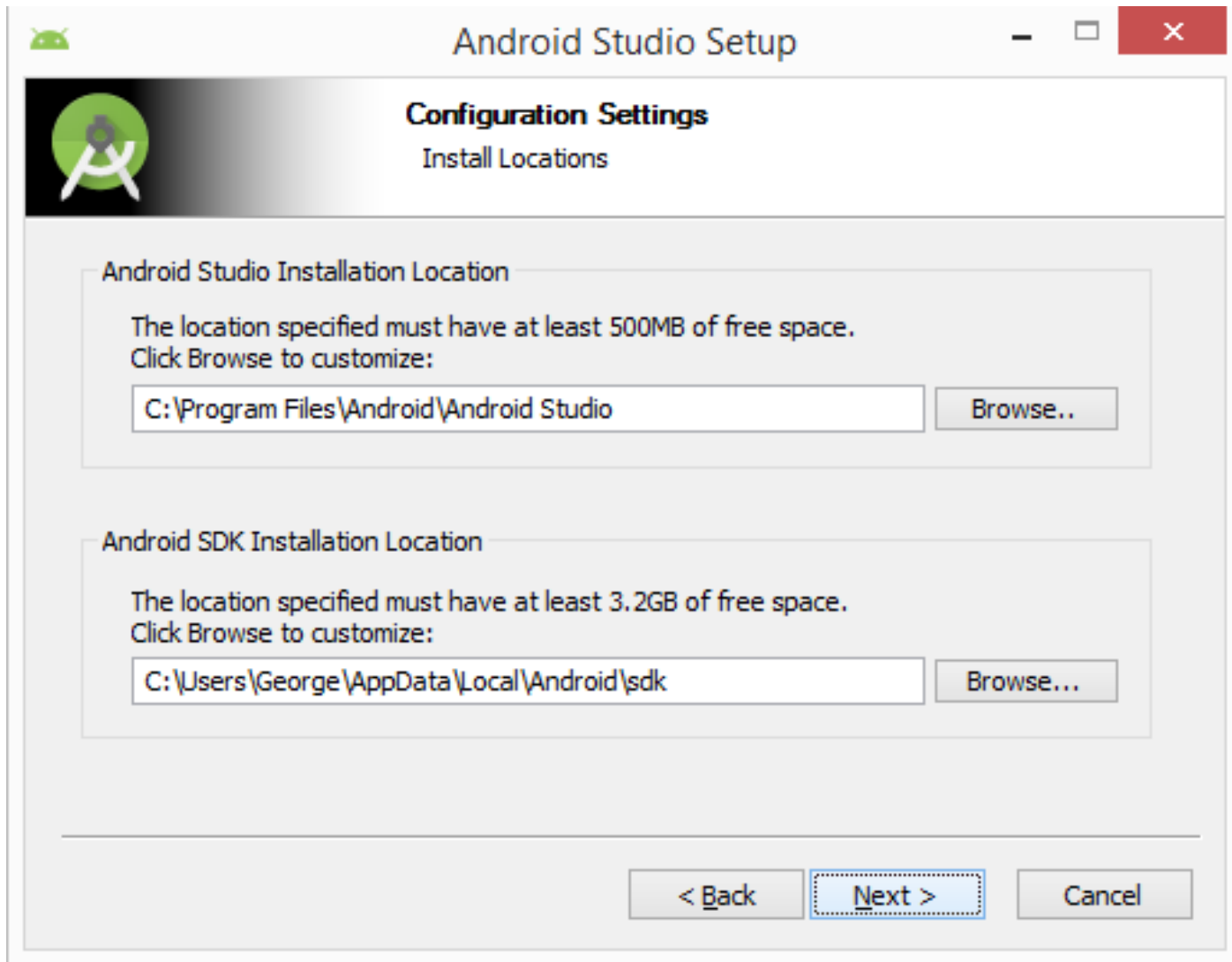
- Android Studio
(<https://developer.android.com/studio/index.html>)
- Pré-requisito: JDK
(<http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>)



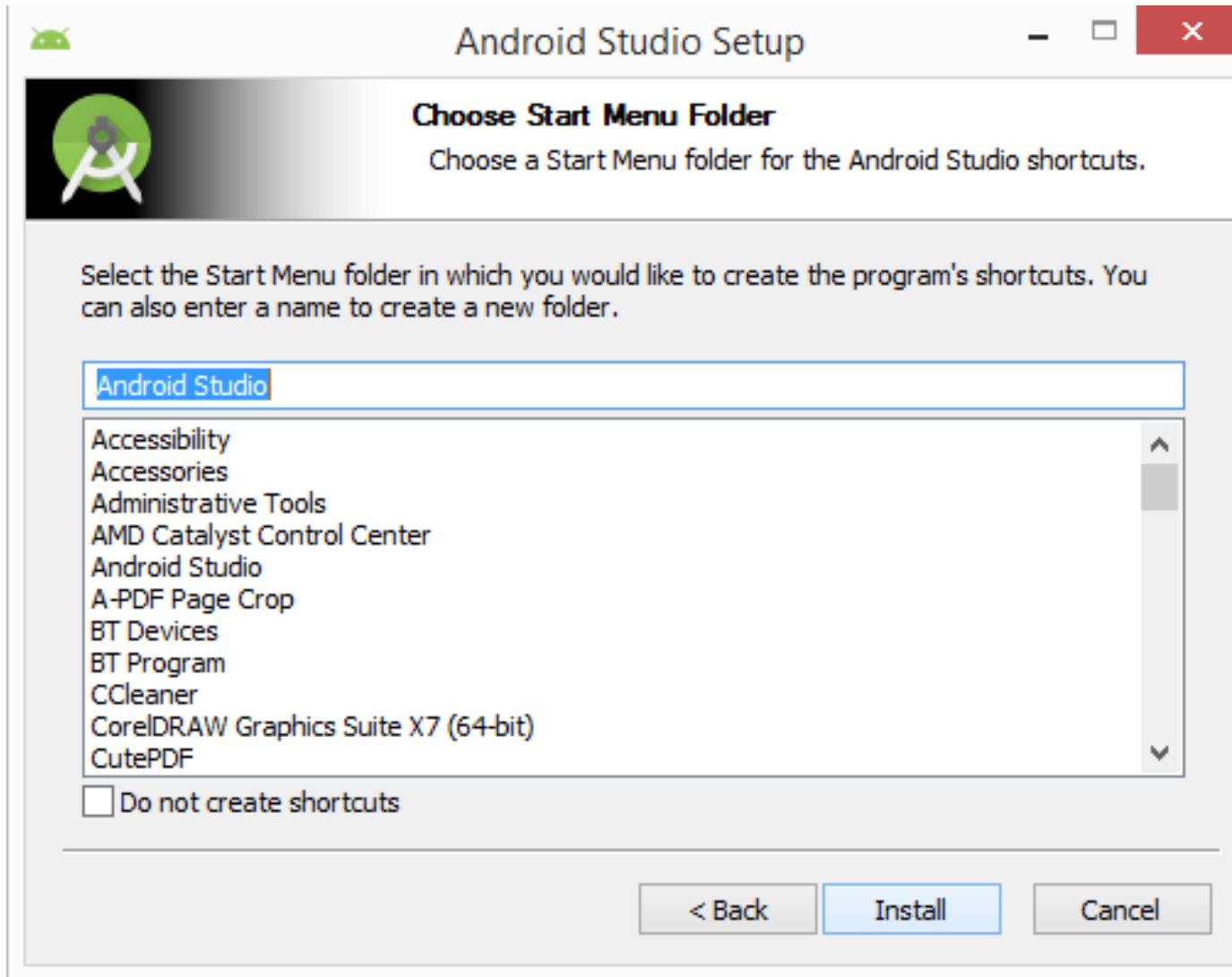
Configurando o Android Studio



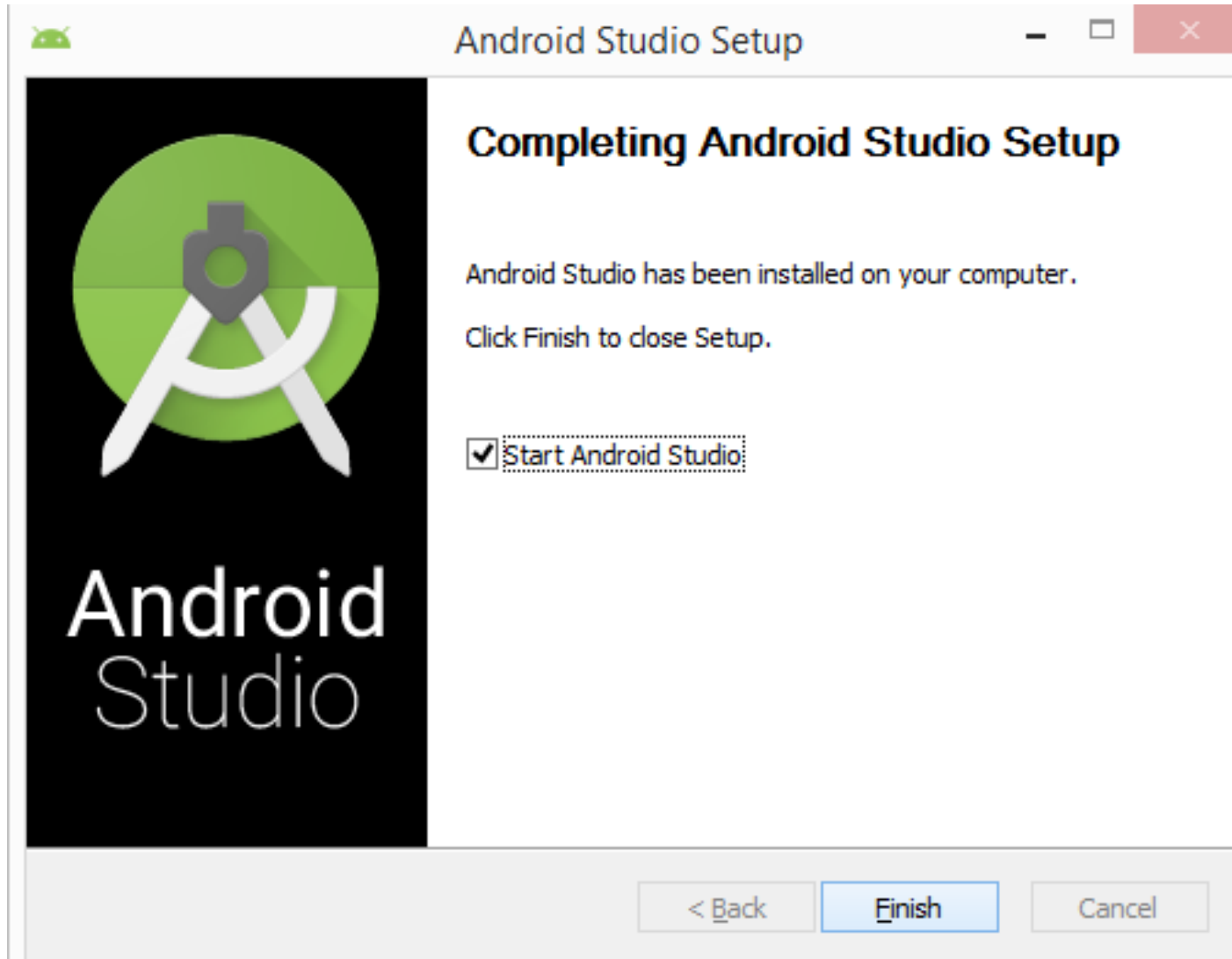
Configurando o Android Studio



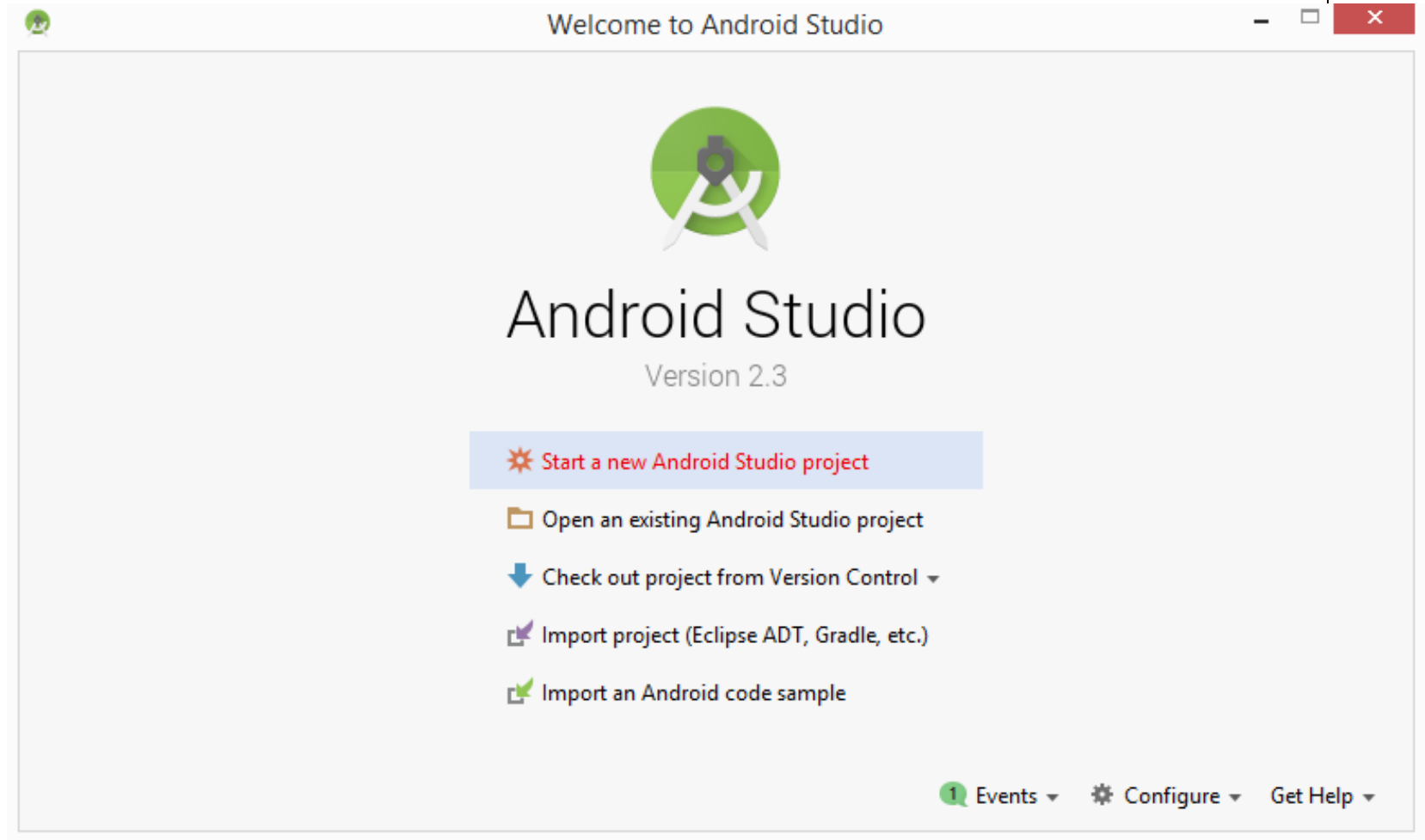
Configurando o Android Studio



Configurando o Android Studio




Configurando o Android Studio



Configurando o Android Studio



Create New Project

 **New Project**
Android Studio

Configure your new project

Application name:

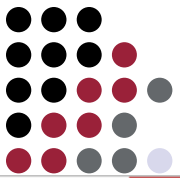
Company domain:

Package name: [Edit](#)

Include C++ support

Project location: ...

Configurando o Android Studio



Create New Project



Target Android Devices

Select the form factors your app will run on

Different platforms may require separate SDKs

Phone and Tablet

Minimum SDK

Lower API levels target more devices, but have fewer features available.

By targeting API 15 and later, your app will run on approximately **97,4%** of the devices that are active on the Google Play Store.

[Help me choose](#)

Wear

Minimum SDK

TV

Minimum SDK

Android Auto

Previous

Next

Cancel

Finish

Configurando o Android Studio



ANDROID PLATFORM VERSION	API LEVEL	CUMULATIVE DISTRIBUTION
4.0 Ice Cream Sandwich	15	
4.1 Jelly Bean	16	99,6%
4.2 Jelly Bean	17	98,1%
4.3 Jelly Bean	18	95,9%
4.4 KitKat	19	95,3%
5.0 Lollipop	21	85,0%
5.1 Lollipop	22	80,2%
6.0 Marshmallow	23	62,6%
7.0 Nougat	24	37,1%
7.1 Nougat	25	14,2%
8.0 Oreo	26	6,0%
8.1 Oreo	27	1,1%

Ice Cream Sandwich

Contacts Provider

Social APIs
User profile
Invite intent
Large photos

Calendar Provider

Calendar APIs
Event intents

VoiceMail Provider

Add voicemails to the device

Multimedia

Media effects for images and videos
Remote control client
Improved media player

Camera

Face detection
Focus and metering areas
Continuous auto focus
Camera broadcast intents

Connectivity

Android Beam for NDEF push with NFC
Wi-Fi P2P connections
Bluetooth health profile
Network usage and controls

Accessibility

Explore-by-touch mode
Accessibility for views
Accessibility services
Improved text-to-speech engine support

User Interface

Spell checker services
Improved action bar
Grid layout
Texture view
Switch widget
Improved popup menus
System themes
Controls for system UI visibility
Hover event support
Hardware acceleration for all windows

Enterprise

VPN services
Device policies
Certificate management

Device Sensors

Improved sensors
Temperature sensor
Humidity sensor

Configurando o Android Studio



Create New Project



Installing Requested Components

```
SDK Path: C:\Users\George\AppData\Local\Android\Sdk
straintLayout 1.0.2 (revision: 1)" complete.
straintLayout 1.0.2 (revision: 1)" finished.
straintLayout for Android 1.0.2 (revision: 1)".
google.com/android/repository/com.android.support.constraint-constraint-layout-1.0.2.zip
ut for Android 1.0.2 (revision: 1)" ready.
straintLayout for Android 1.0.2 (revision: 1)"
yout for Android 1.0.2 in C:\Users\George\AppData\Local\Android\Sdk\extras\m2repository\com\android\support\constraint\constraint-layout\1.0.2
ut for Android 1.0.2 (revision: 1)" complete.
ut for Android 1.0.2 (revision: 1)" finished.
\AppData\Local\Android\Sdk\add-ons\addon-google_apis-google-24\package.xml
\AppData\Local\Android\Sdk\build-tools\25.0.2\package.xml
\AppData\Local\Android\Sdk\docs\package.xml
\AppData\Local\Android\Sdk\emulator\package.xml
\AppData\Local\Android\Sdk\extras\android\m2repository\package.xml
\AppData\Local\Android\Sdk\extras\google\m2repository\package.xml
\AppData\Local\Android\Sdk\extras\intel\Hardware_Accelerated_Execution_Manager\package.xml
\AppData\Local\Android\Sdk\extras\m2repository\com\android\support\constraint\constraint-layout-solver\1.0.2\package.xml
\AppData\Local\Android\Sdk\extras\m2repository\com\android\support\constraint\constraint-layout\1.0.2\package.xml
\AppData\Local\Android\Sdk\patcher\v4\package.xml
\AppData\Local\Android\Sdk\platform-tools\package.xml
\AppData\Local\Android\Sdk\platforms\android-25\package.xml
\AppData\Local\Android\Sdk\sources\android-25\package.xml
\AppData\Local\Android\Sdk\system-images\android-25\google_apis\x86\package.xml
```

Done

Previous

Next

Cancel

Finish

Criando um novo projeto



Create New Project

Add an Activity to Mobile

Add No Activity

Basic Activity

Bottom Navigation Activity

Empty Activity

Fullscreen Activity

Google AdMob Ads Activity

Google Maps Activity

Login Activity

Master/Detail Flow

Navigation Drawer Activity

Previous Next Cancel Finish

Detailed description: This is a screenshot of the 'Create New Project' dialog in an Android Studio interface. The window title is 'Create New Project'. Below the title bar is a dark header with the Android Studio logo and the text 'Add an Activity to Mobile'. The main area displays ten activity templates in a grid. Each template shows a preview of the activity's UI. The 'Empty Activity' template is highlighted with a blue border and a blue bar at the bottom. At the bottom of the window, there are five buttons: 'Previous', 'Next', 'Cancel', and 'Finish'. The 'Next' button is highlighted in blue.

Criando um novo projeto



Create New Project

Customize the Activity

Creates a new empty activity

←

Empty Activity

Activity Name: MainActivity

Generate Layout File

Layout Name: activity_main

Backwards Compatibility (AppCompat)

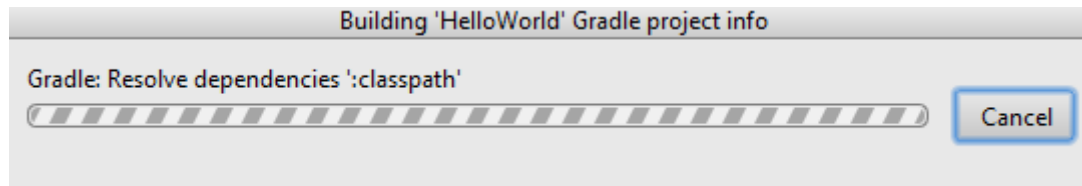
The name of the activity class to create

Previous Next Cancel Finish

Criando um novo projeto



- Leva algum tempo na primeira execução pois o Android Studio faz o download do Gradle (e não te avisa!)



Criando um novo projeto



HelloWorld - [C:\Users\George\HelloWorld] - MainActivity.java - Android Studio 2.3

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

app

br.ufop.george.helloworld

MainActivity

Tip of the Day

Did you know ... ?

When using basic code completion (Ctrl+Espaço), type any characters that exist anywhere in an identifier.

nu

- continue
- addr2num([optional] addr) (1.7)
- emptyEnumeration (1.7)
- filterEnumeration([optional] e, ...)
- memberWindow (NUTM.io) Object

Press ^ to choose the selected (or first) suggestion and ⌘

Show Tips on Startup

Previous Tip Next Tip Close

Help improve Android Studio by sending usage s! Please click [I agree](#) if you want to help make Android Studio better or [I don't agree](#) otherwise....

Messages Terminal Android Monitor TODO

Gradle build finished in 34s 455ms (2 minutes ago)

Event Log Gradle Console

CRLF UTF-8 Context: <no context>

Criando um novo projeto

A screenshot of an IDE (Android Studio) showing the MainActivity.java file. The interface includes a top menu bar (File, Edit, View, etc.), a toolbar with various icons, and a project structure view on the left. The main editor displays the following code:

```
1 package br.ufop.george.helloworld;
2
3 import android.app.Activity;
4 import android.os.Bundle;
5
6 public class MainActivity extends Activity {
7
8     @Override
9     protected void onCreate(Bundle savedInstanceState) {
10         super.onCreate(savedInstanceState);
11         setContentView(R.layout.activity_main);
12     }
13 }
14
```

The code is highlighted in yellow. The IDE also shows a status bar at the bottom with a red error icon and a message: "IncorrectOperationException: Sorry but parent: com.android.tools.idea.ui.builder.surface.DesignSurface[0,56,584x455,invalid,layout=java.awt.BorderLayout,alignmentX=0,... (5 minutes ago) 6:14 CRLF+ UTF-8+ Context: <no context>".

Criando um novo projeto



HelloWorld - [C:\George\Professor\Disciplinas\2017-1\CSI489ComputacaoMovel\Codigos\A01\HelloWorld] - [app] - ...\app\src\main\res\layout\activity_main.xml - Android Studio 2.3.1

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

activity_main.xml x MainActivity.java x

Project Structure: app, manifests, java, br.ufop.george.helloworld, MainActivity, br.ufop.george.helloworld (androidTest), br.ufop.george.helloworld (test), res, drawable, layout, activity_main.xml, mipmap, values, Gradle Scripts

```
1 <?xml version="1.0" encoding="utf-8" ?>
2 <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
3     android:layout_width="match_parent"
4     android:layout_height="match_parent">
5
6     <TextView
7         android:layout_width="wrap_content"
8         android:layout_height="wrap_content"
9         android:text="Hello World!" />
10
11 </LinearLayout>
12
```

Design Text

Event Log Gradle Console

IncorrectOperationException: Sorry but parent: com.android.tools.idea.ui.builder.surface.DesignSurface[0,56,584x455,invalid,layout=java.awt.BorderLayout,alignmentX=0,... (6 minutes ago) 12:1 CRLF+ UTF-8 Context: <no context>

Criando um novo projeto



The screenshot shows the Android Studio IDE interface. At the top, the title bar reads 'activity_main.xml'. Below it is a toolbar with various icons for zooming, panning, and other design tools. The main workspace is divided into three panels: a Palette on the left, a Component Tree at the bottom left, and a Properties panel on the right. The Palette shows a list of widgets: All, Widgets, Text, Layouts, and Containers. Under 'Text', there are options for TextView, Button, ToggleButton, CheckBox, and RadioButton. The Component Tree shows a 'LinearLayout (horizontal)' containing an 'Ab TextView - "Hello World!"'. The Properties panel on the right shows the configuration for the selected TextView, including ID, layout_width, layout_height, text, textAppearance, and visibility. The central design view shows a mobile phone screen with a blue header containing the text 'Hello World!' and a dark blue body. The bottom of the screen shows the Android navigation bar. At the bottom of the IDE, there are tabs for 'Design' and 'Text', with 'Design' currently selected.

Criando um novo projeto



Barra e menu de ferramentas

Editor de código

Arquivos do projeto

```
1 package br.ufop.george.helloworld;
2
3 import android.app.Activity;
4 import android.os.Bundle;
5
6 public class MainActivity extends Activity {
7
8     @Override
9     protected void onCreate(Bundle savedInstanceState) {
10         super.onCreate(savedInstanceState);
11         setContentView(R.layout.activity_main);
12     }
13 }
14
```

Gradle build finished in 34s 455ms (4 minutes ago)

1:1 CRLF UTF-8 Context: <no context>

Criando um novo projeto



Aperte o play!

Código fonte Java

```
1  
2  
3  
4 import android.os.Bundle;  
5  
6  
7  
8  
9  
10 protected void onCreate(Bundle savedInstanceState) {  
11     super.onCreate(savedInstanceState);  
12     setContentView(R.layout.activity_main);  
13  
14
```

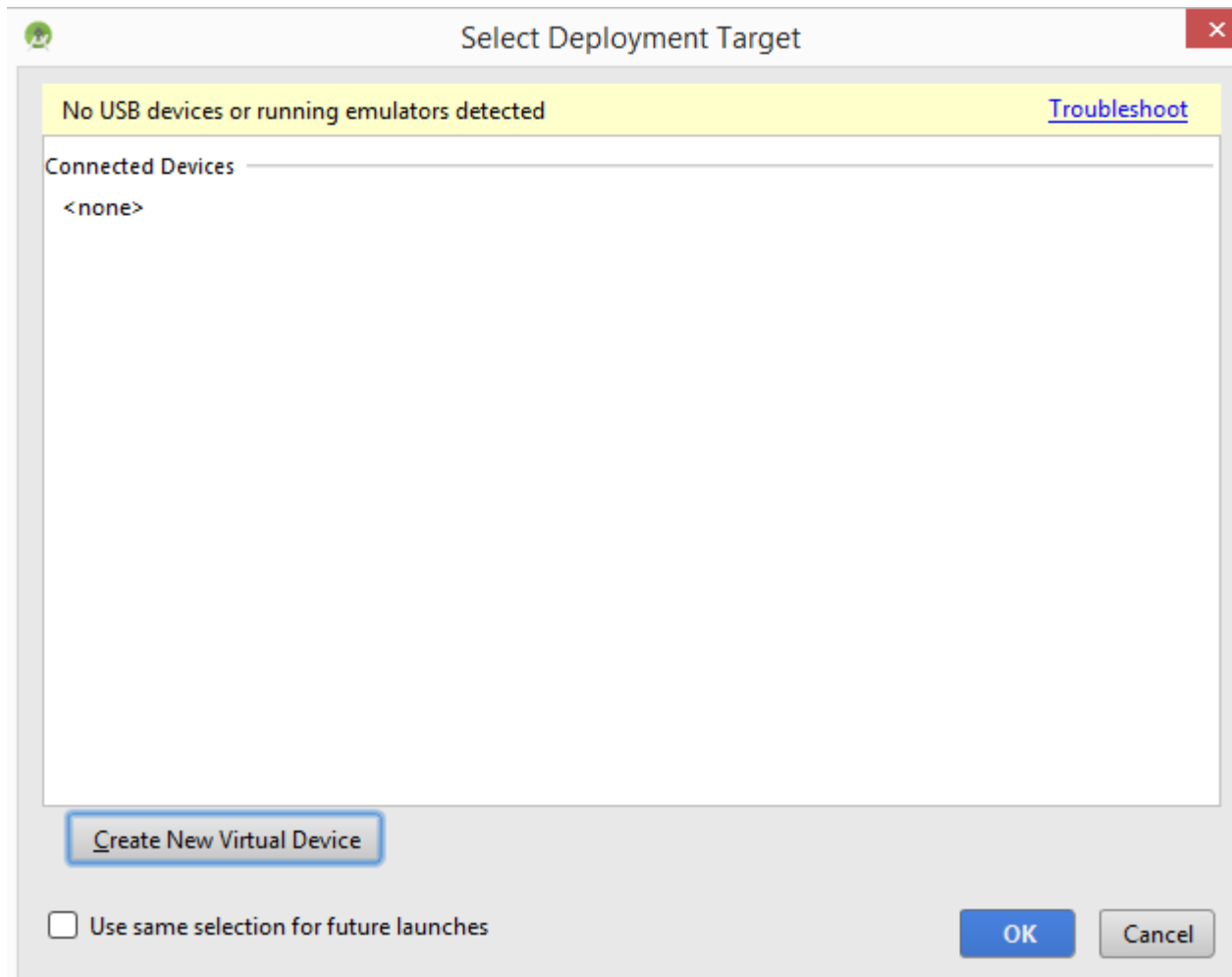
Imagens da aplicação

Layout de telas

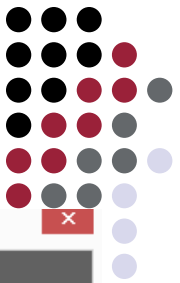
XML com definições adicionais

Messages Terminal Android Monitor TODO Event Log Gradle Console
Gradle build finished in 34s 455ms (4 minutes ago) 1:1 CRLF UTF-8 Context: <no context>

Criando um dispositivo virtual



Criando um dispositivo virtual



Virtual Device Configuration

Select Hardware
Android Studio

Choose a device definition

Category	Name	Size	Resolution	Density
TV	Pixel XL	5,5"	1440x2560	560dpi
Wear	Pixel	5,0"	1080x1920	xxhdpi
Phone	Nexus S	4,0"	480x800	hdpi
Tablet	Nexus One	3,7"	480x800	hdpi
	Nexus 6P	5,7"	1440x2560	560dpi
	Nexus 6	5,96"	1440x2560	560dpi
	Nexus 5X	5,2"	1080x1920	420dpi
	Nexus 5	4,95"	1080x1920	xxhdpi
	Nexus 4	4,7"	768x1280	xhdpi
	Galaxy Nexus	4,65"	720x1280	xhdpi

Search:

Nexus 5X

Size: large
Ratio: long
Density: 420dpi


Buttons: New Hardware Profile, Import Hardware Profiles, Clone Device...

Navigation: Previous, Next, Cancel, Finish, Help

Criando um dispositivo virtual



Virtual Device Configuration


 **System Image**
Android Studio

Select a system image

Recommended | x86 Images | Other Images

Release Name	API Level	ABI	Target
Nougat	25	x86	Android 7.1.1 (with Google APIs)
<i>Nougat</i> Download	24	x86	<i>Android 7.0 (with Google APIs)</i>
<i>Marshmallow</i> Download	23	x86	<i>Android 6.0 (with Google APIs)</i>
<i>Lollipop</i> Download	22	x86	<i>Android 5.1 (with Google APIs)</i>

Nougat



API Level
25

Android
7.1.1

Google Inc.

System Image
x86

These images are recommended because they run the fastest and include support for Google APIs


Questions on API level?
See the [API level distribution chart](#)

Previous | **Next** | Cancel | Finish | Help

Criando um dispositivo virtual





Virtual Device Configuration



 **Android Virtual Device (AVD)**
Android Studio

Verify Configuration

AVD Name:

 Nexus 5X	5.2 1080x1920 xxhdpi	<input type="button" value="Change..."/>
 Nougat	Android 7.1.1 x86	<input type="button" value="Change..."/>

Startup orientation

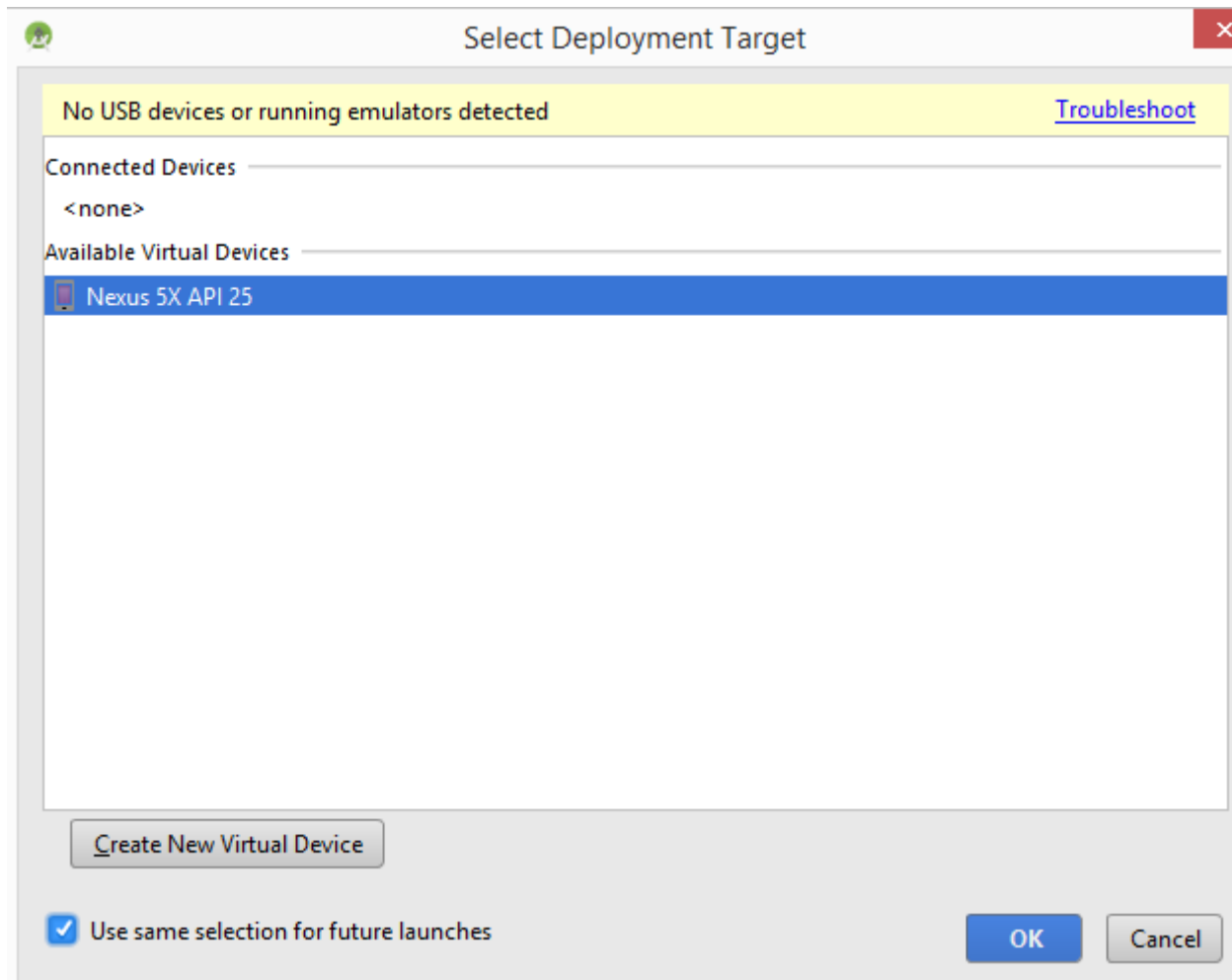
 Portrait  Landscape

Emulated Performance Graphics:

Device Frame Enable Device Frame

Nothing Selected

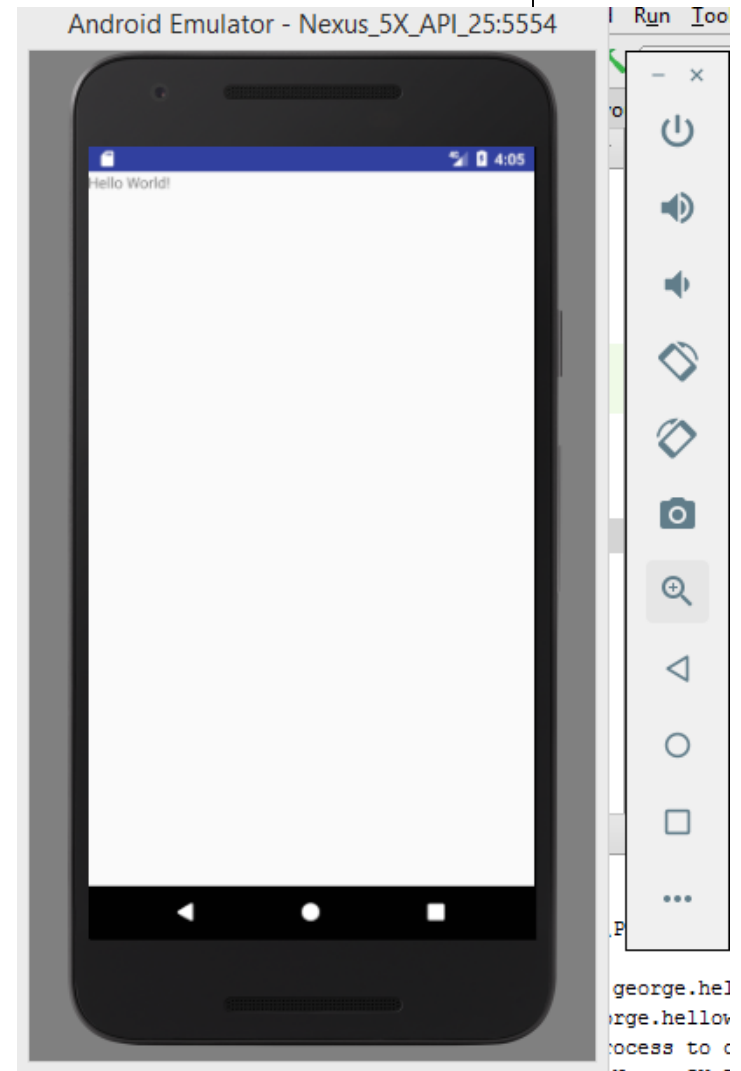
Criando um dispositivo virtual



Tudo pronto



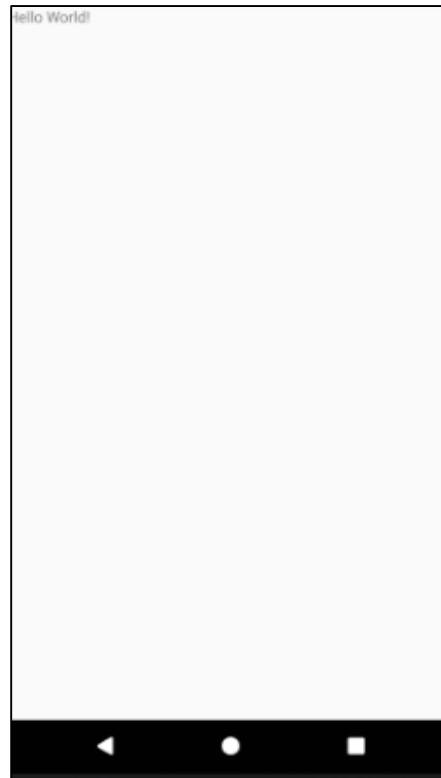
- Aqui está o seu novo smartphone com seu app
- Agora começa sua jornada como desenvolvedor Android!



HelloWorld



Projeto A03 HelloWorld.rar



Atalhos importantes



Ctrl + Espaço	Auto completar
Ctrl + B	Ir para a definição
Shift + F6	Renomear
Ctrl + /	Comentar / descomentar
Ctrl + Alt + L	Reformatar código
Shift + F10	Executar
Ctrl + Shift + S	Configurações da IDE
Alt + Insert	Geração automática de const. e getters/setters

Usar dispositivo como emulador



- Ativar opções de desenvolvedor no dispositivo
 - Liberar configurações de desenvolvedor: Configurações -> Sobre o telefone -> tocar sete vezes sobre o número da versão

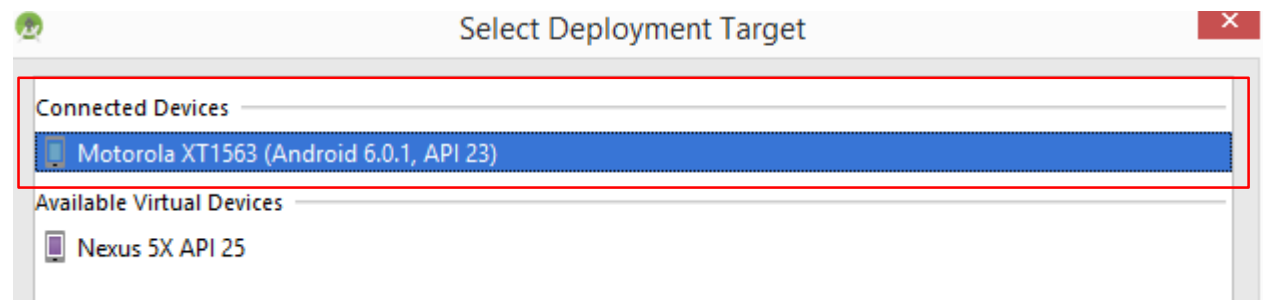


- Menu: Configurações -> Programador será liberado

Usar dispositivo como emulador



- Instalar driver USB para ADB (Android Debug Bridge)
 - <https://developer.android.com/studio/run/oem-usb.html?hl=pt-br#Drivers>
- Conectar o dispositivo à USB
- Ativar Depuração USB
 - Configurações -> Programador -> Deputação USB
 - Marcar a caixinha “Permitir depuração USB”
 - Executar aplicação



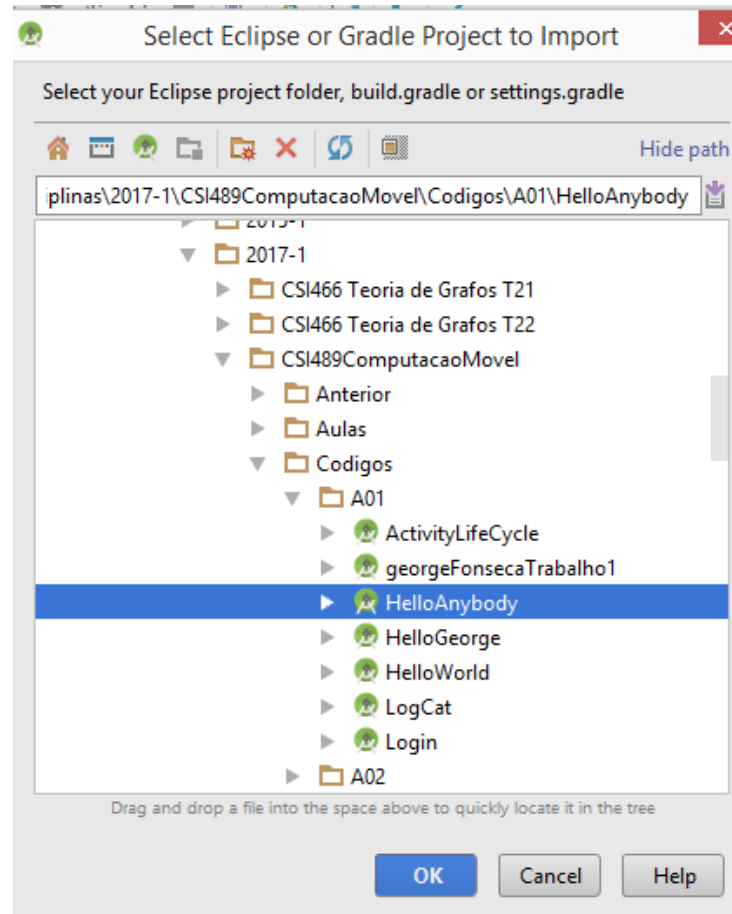
Importando projetos



The screenshot shows the Android Studio 2.3 interface. The 'File' menu is open, and 'Import Project...' is selected. The main editor displays the XML layout for 'activity_main.xml'. The code includes a `TextView` widget with the text 'Hello World!'. The status bar at the bottom shows 'Gradle build finished in 9s 153ms (13 minutes ago)'.

```
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
New
Open...
Open Recent
Close Project
Link C++ Project with Gradle
Settings... Ctrl+Alt+S
Project Structure... Ctrl+Alt+Shift+S
Other Settings
Import Settings...
Export Settings...
Settings Repository...
Save All Ctrl+S
Synchronize Ctrl+Alt+Y
Invalidate Caches / Restart...
Export to HTML...
Print...
Add to Favorites
File Encoding
Line Separators
Make File Read-only
Power Save Mode
Exit
Build Variants
New Project...
Import Project...
Project from Version Control
New Module...
Import Module...
Import Sample...
File
Directory
C++ Class
C/C++ Source File
C/C++ Header File
Image Asset
Vector Asset
Singleton
Edit File Templates...
AIDL
Activity
Android Auto
Folder
Fragment
Google
Other
Service
UI Component
Wear
Widget
XML
Resource Bundle
main.xml
MainActivity.java x strings.xml x
android.support.constraint.ConstraintLayout TextView
<?xml version="1.0" encoding="utf-8"?>
<include layout="@layout/content_main"
android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
xmlns:app="http://schemas.android.com/apk/res-auto"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context="br.ufop.george.helloworld.MainActivity">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    </TextView>
</include>
</android.support.constraint.ConstraintLayout>
```

Importando projetos

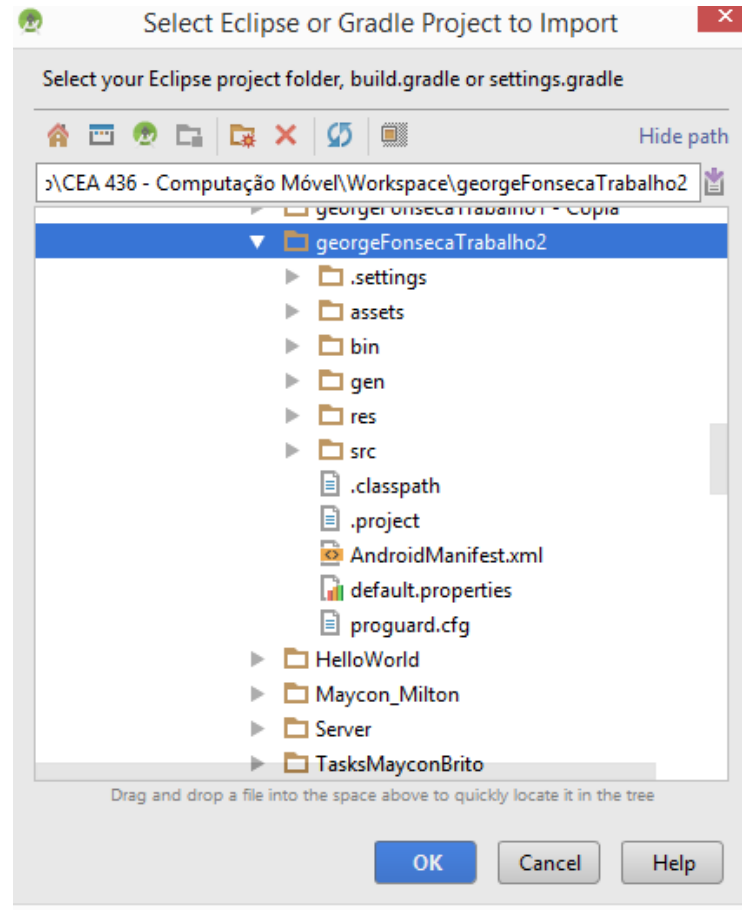


- Eventuais problemas de compatibilidade são resolvidos automaticamente (Android Studio irá solicitar a atualização dos componentes necessários)

Importando projetos



- É possível importar projetos legados (não aparecerão com o ícone do Android Studio)!
- Basta selecionar a pasta do projeto e clicar OK:



Renomear projeto



- Infelizmente não é trivial renomear um projeto pela IDE..
- Alternativa:
 - Fechar Android Studio
 - Renomear a pasta do projeto para o nome desejado
 - Abrir Android Studio
 - Abrir o projeto (somente pelo Open...)
 - Limpar o projeto (Build -> Clean Project)
- Importante para copiar projetos e reaproveitar código!



- Se você não conseguiu executar o exemplo “HelloWorld” no emulador e no dispositivo favor procurar me procurar solucionarmos o(s) problema(s)!
- Precisaremos disso funcionando para as próximas aulas/trabalhos!





- Google and Open Handset Alliance n.d. **Android API Guide**. <http://developer.android.com/guide/index.html>. Acessado em Maio de 2017.
- Google and Open Handset Alliance n.d. **Android training guide**. <http://developer.android.com/training/index.html>. Acessado em Maio de 2017.
- Lecheta, R. R. **Google Android: Aprenda a criar aplicações para dispositivos móveis com o Android SDK**. 3ª edição. São Paulo: Novatec Editora, 2013.

