





MIT Inventor

prvý dotyk aplikácie

Peter Borovanský KAI, I-18

MS-Teams: 2sf3ph4, List, github

borovan 'at' ii.fmph.uniba.sk

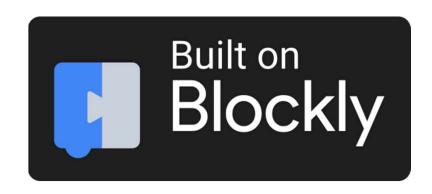
Android Apps with App Inventor: The Fast and Easy Way to Build Android Apps

J.H.Kloss, Amazon: 4.4/5

- Installing and configuring App Inventor
- 2. Building modern, attractive mobile user interfaces
- Controlling Android media hardware, including the camera
- 4. Saving data locally with TinyDB, or in the cloud with Tiny
- 5. Streamlining and automating phone, text, and email com-
- 6. Tracking orientation, acceleration, and geoposition
- 7. Integrating text-to-speech and speech-to-text in your apps
- 8. Controlling other apps and Web services with ActivityStarter
- Building mobile mashups by exchanging data with Web APIs
- 10. Testing your apps for diverse hardware with the Android Emulator
- 11. Example apps

http://books.google.sk/books?id=rfKyt6TRLloC&pg=SA4-PA7&lpg=SA4-PA

http://www.amazon.com/Android-Apps-App-Inventor-Build/dp/0321812700/ref=sr 1 7?s=books&ie=UTF8&qid=1322522259&sr=1-7



Iné zdroje

- AppInventor at MIT (http://appinventor.mit.edu/)
- Kurz edX: Mobile Computing with App Inventor CS Principles (english)
 (https://courses.edx.org/courses/course-v1:TrinityX+T007x+1T2017/course/)
- Kurz Learn2Code: MIT Inventor (slovensky)
 (https://www.learn2code.sk/kurzy/mit-app-inventor)
- príklady hotových projektov, ak radšej čítate hotové projekty:
 App Inventor Snippets (http://puravidaapps.com/snippets.php)
- App Inventor Teach pre učiteľov (http://appinventor.mit.edu/explore/teach.html)
- MIT Inventor Tutorials Hour of Code (http://appinventor.mit.edu/explore/hour-of-code.html)
- MIT Inventor Public Open Source (http://appinventor.mit.edu/appinventor-sources/)
- Dlho očakávané MIT Inventor for iOS (http://doesappinventorrunonios.com/)



Alternatívne nástroje k MIT

(MIT Inventor už zďaleka nie je jedný no-code nástroj)

- AppGyver https://www.appgyver.com/
 - no code platform
 - nie je ohraničený len pre platformu Android



- Thunkable https://thunkable.com/
 - drag and drop no coding
 - cross platform



- Kodular https://creator.kodular.io/
 - Android only







http://appinventor.mit.edu/explore/ai2/setup-emulator.html

- potrebujete google-mail účet
- http://ai2.appinventor.mit.edu/

Počítač:

- platformy: MS-Windows, Mac OS X, Ubuntu, Debian
- browser: FF, Safari, Chrome, TE
- setup page: http://appinventor.mit.edu/explore/ai2/setup.html
- pre MS-Windows treba pustiť MIT Appinventor Tools 2.3.0 (~80 MB)

Na zariadení:

https://play.google.com/store/apps/details?id=edu.mit.appinventor.aicompanion3

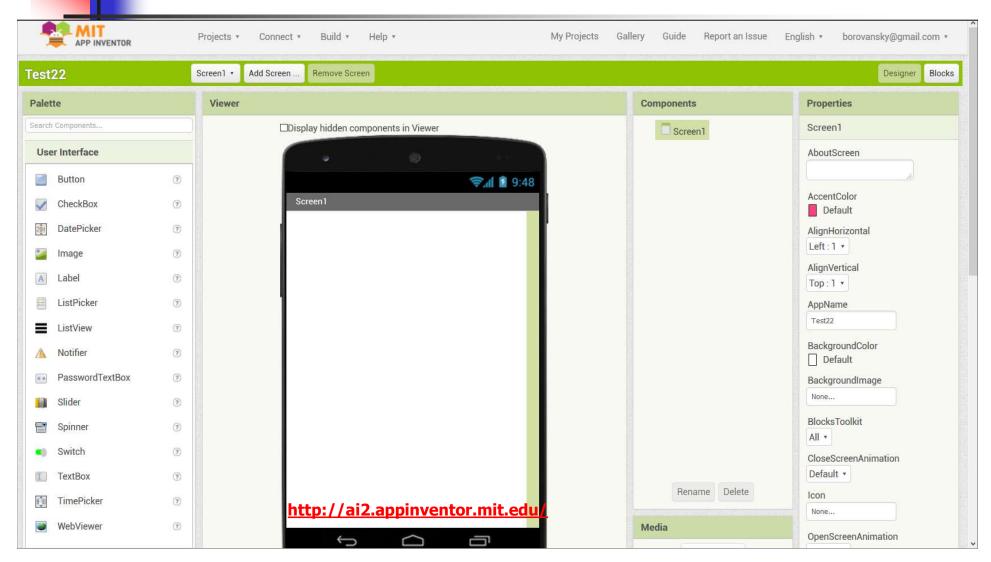
Android Mobil (ale prežijete aj s emulátorom):

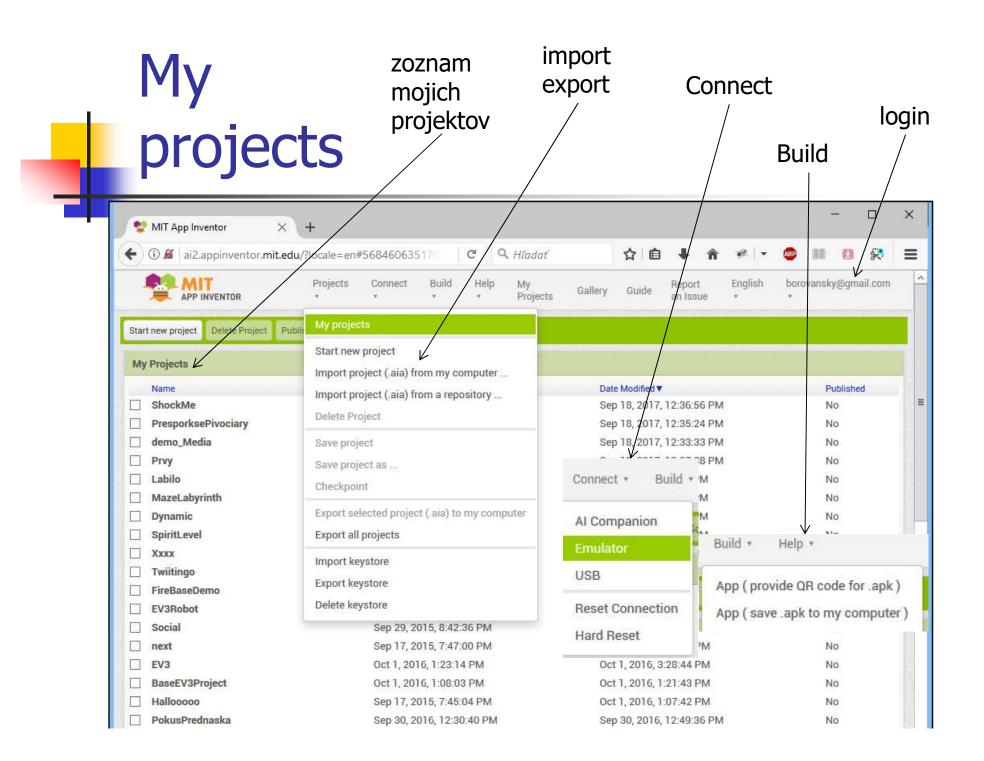
v mobile: Setting/Application/Development/, 7xklik na Build Number
 USB Debugging = ON (môžete uploadovať vlastné aplikácie .apk)
 Stay awake = ON (nebude vám uspávať, kým ho máte na kábli)
 Allow mock location = ON (ak chcete používať nejaké fake GPS – neskôr)
 Sound & Display/Orientation = OFF



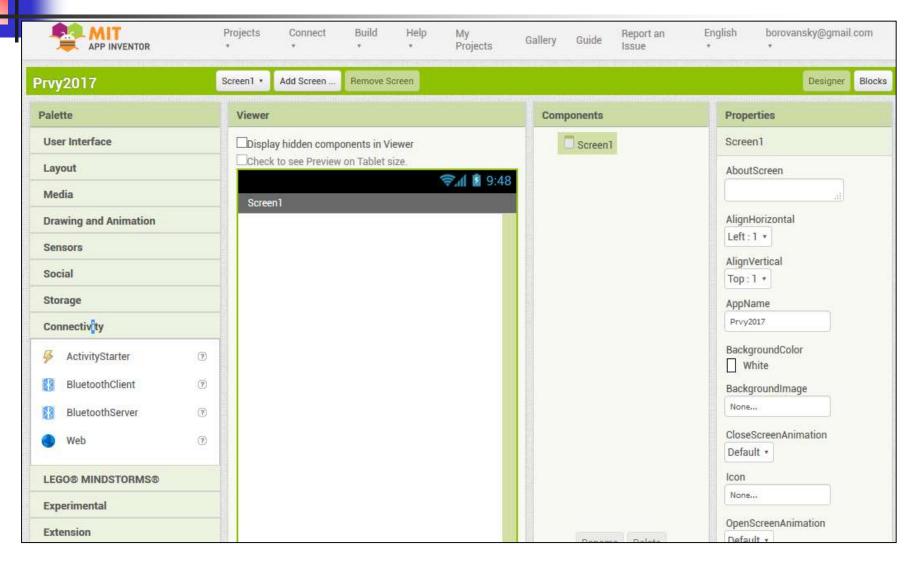


MIT Inventor – hlavný panel





Prvý projekt





Connect WiFi





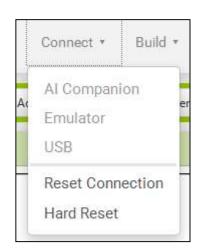
Nainštalujte MIT AI2 Companion App cez Google Play Store

https://play.google.com/store/apps/details?id=edu.mit.appinventor.aicompanion3
Connect to Device

spusti MIT AI2 Companion App







Palety komponentov

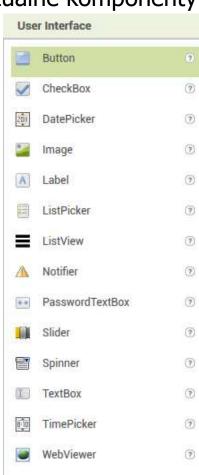
- User Interface
 - Button, CheckBox, Clock, Image, Label, List/Time/Date-Picker, Password, Slider, TextBox
- Layout
 - Horizontal/Vertical/Table Arrangement [Scrollable]
- Media
 - Camcoder, Camera, ImagePicked, Player, Sound, VideoPlayer, TextToSpeech, SpeechRecognizer
- Drawing and Animation
 - Ball, Canvas, ImageSprite
- Social
 - ContactPicker, EmailPicker, PhoneNumberPicker, PhoneCall, Texting, Twitter, Sharing
- Sensor
 - Accelerometer, Location, Orientation, Gyro, Pedometer, Proximity, Bar Code Scanner
- Storage
 - File, TinyDB, FireBaseDB
- Connectivity
 - BluetoothClient-Server, ActivityStarter
- Lego MINDSTORMS

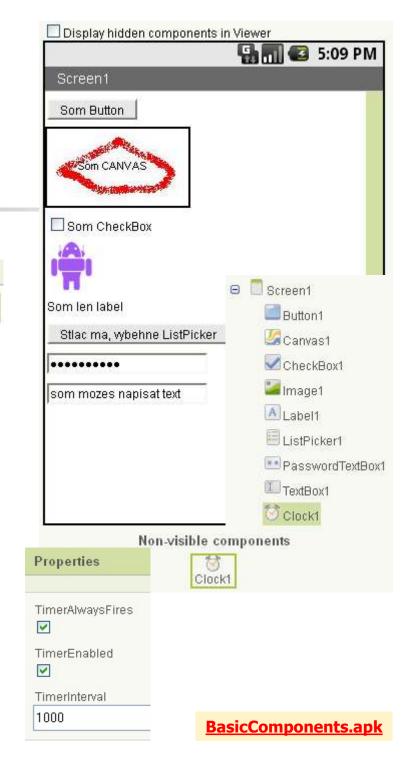


User Interface

Ilustrujeme si základné vizuálne komponenty:

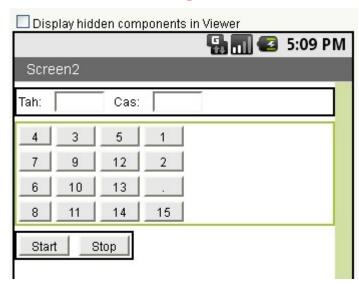
- Button
- CheckBox
- Clock
- Image
- <u>Label</u>
- <u>List/Time/Date-Picker</u>
- PasswordTextBox
- TextBox
- Notifier
- WebViewer

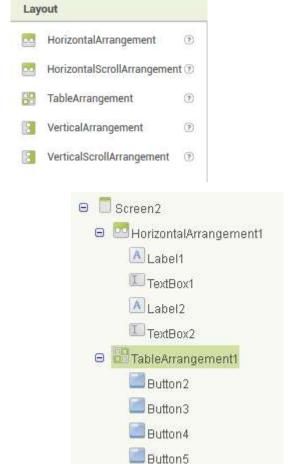




Layouts (Arrangement)

- HorizontalArrangement
- <u>TableArrangement</u>
- VerticalArrangement











- Camera
- ImagePicker
- Player
- Sound
- VideoPlayer



- Spustit': block editor
- Uložiť (strýčko Google si to ukladá sám v MyProjects:-)





BasicComponents.apk

00:36 Start Reset Visible * to true Visible • false to TimerEnabled * to false Visible to false Visible * true to

Stopky (clock – timer)

```
initialize global millis to 0
when Clock1 Timer
    set global millis v to
                           get global millis
                                                       1000
     call displayTime *
when btnStart . Click
                                                        when Screen1 Initialize
     set Clock1
                    TimerEnabled *
                                    to true
                                                             set btnStart *
                                                        do
     set btnStart *
                    Visible
                              to
                                    false
                                                             set btnStop v
     set btnStop ·
                    Visible *
                                   true
when btnReset
                                                        when btnStop ... Click
                    TimerEnabled *
                                   to false
    set Clock1
                                                             set Clock1
     set global millis to 0
                                                             set btnStop *
     call displayTime *
                                                             set btnStart *
   to displayTime
     set display
                    Text
                                 call Clock1 *
                                                .FormatDateTime
                            to
                                                                  call Clock1 . MakeInstantFromMillis
                                                        instant
                                                                                                       get global millis *
                                                                                               millis
                                                        pattern
                                                                   mm:ss
                                                                                                        L2CStopky.apk
```



jednoduché malovátko prstom

X

do

```
when BtnBlue .Click
                   PaintColor •
    set Canvas1 v
                               to
when BtnGreen
                   PaintColor to
    set Canvas1 *
when BtnRed
    set Canvas1 v
                   PaintColor *
     ButtonClear
    call Canvas1 .Clear
when ButtonSmall
                  .Click
                   LineWidth v to
    set Canvas1 v
when ButtonBig . Click
    set Canvas1 v . LineWidth v to 15
```

```
FingerPaint by YOUR NAME HERE
          Red
                                 Green
Canvas1 Touched
   touchedAnySprite
   Canvas1 .DrawCircle
                   centerX
                              get x v
                   centerY
                              get y
                    radius
                             10
                        fill
                             true
           .Dragged
  startY
           prevX
                    prevY
                             currentX
                                        currentY
                                                   draggedAnySprite
                           get prevX ·
                     x1
                           get prevY ·
                     y1
                               currentX
         Draw a line on the screen.
```

```
Canvas1
 startX
do
    call Canvas1 .DrawLine
                              get currentY
```

FingerPaint2

Pokročilejšia verzia

- Hrúbka pera
 - globálna premenná brushSize
- Kreslenie čiar
 - drawingCanvas.Dragged

```
initialize global brushSize to
when ButtonBigBrush Click
    set global brushSize to
                               get global brushSize *
when DrawingCanvas
                        .Dragged
                                  currentX
                                            currentY
                                                      draggedAnySprite
 startX
         startY
                 prevX
                         prevY
                           LineWidth to
        Draw ingCanvas *
                                             get global brushSize *
     call Draw ingCanvas
                          .Draw Line
                                       get prevX *
                                 x1
                                       get prevY *
                                 y1
                                      get currentX
                                 x2
                                      get currentY
                                 y2
when Drawing Canvas Touched
         touched Any Sprite
     call DrawingCanvas
                          .DrawCircle
                                        get x
                              centerX
                                        get y
                              centerY
                                        get global brush Size
                               radius
                                       true *
                                  fill
                                                       FingerPaint2.apk
```



- Ukladanie obrázku
 - Persistencia
- Práca s TinyDB
 - čo je HashMap<String, Object>

```
ButtonSave *
               .Click
call Notifier1 *
              .ShowAlert
                              picture is going to be saved
                    notice
call TinyDB1 . StoreValue
                               filename
                       tag
                              FingerPainting.png
              valueToStore
call TinyDB1 . StoreValue
                              call TinyDB1 .GetValue
                       tag
                                                            filename
                                                   tag
                                     valuelfTagNotThere
                              call DrawingCanvas
              valueToStore
                                                    .Save
call Notifier1 .ShowAlert
                    notice
                             ioin 🔯
                                       call TinyDB1 .GetValue
                                                                                      is saved
                                                                     filename
                                                             taq
                                              valuelfTagNotThere
```

The data in TinyDB is persistent only when you have packaged and downloading your app. If you are developing connected to the phone, and you restart the Appinventor application, or if you disconnect and reconnect the phone, then the data base will start fresh. This is a case where the application is not merely being stopped and restarted; it is being removed from the phone and then reloaded.

Ak chcete zmazať perzistentné dáta, Settings/Application/ClearData

FingerPaint2.apk

FingerPaint2



```
Dynamic
(random)
when Ball1
             EdgeReached
                                                                            E 🔚 🛦 🛦 🛦 20:01 🗣 8 🛗 » 🛊
 edge
do
       Ball1
                Speed *
                              •
                                   Ball1 *
                                            Speed *
                                                          1.2
    set Ball1
                Radius *
                               ٠
                          to
                                    Ball1
                                            Radius *
                                                          1.2
    set Ball1
                X to
                          300
                                         random fraction
    set Ball1
                Y to
                          90
                                        random fraction
when Clock1 Timer
    set Ball1
                Heading •
                           to
                                  •
                                                                    180
                                       360
                                                 random fraction

■ Screen1

                                                                          Clock1
     Canvas1
                Touched
                                                     TimerAlwaysFires
                                                         Ball1
        touchedAnySprite
 X
                                                                          TimerEnabled
                                                        Clock1
    call Ball1 ... MoveTo
do
                                                                          V
                         get x
                     X
                                                                          TimerInterval
                                                                          100
                         get y *
```

Lietajuca Gulicka

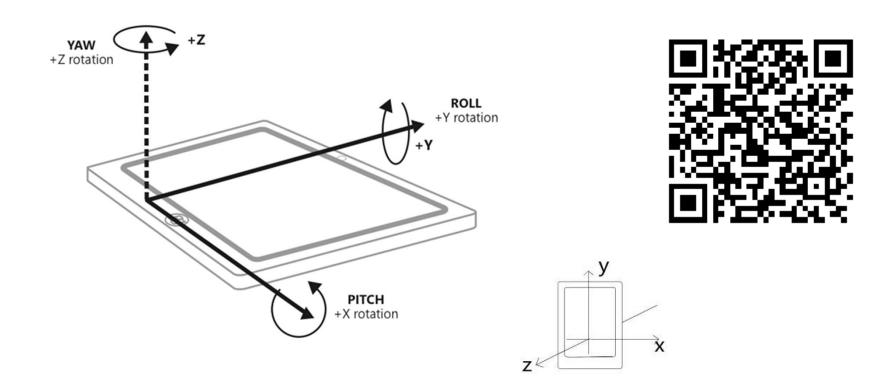
Dynamic.apk

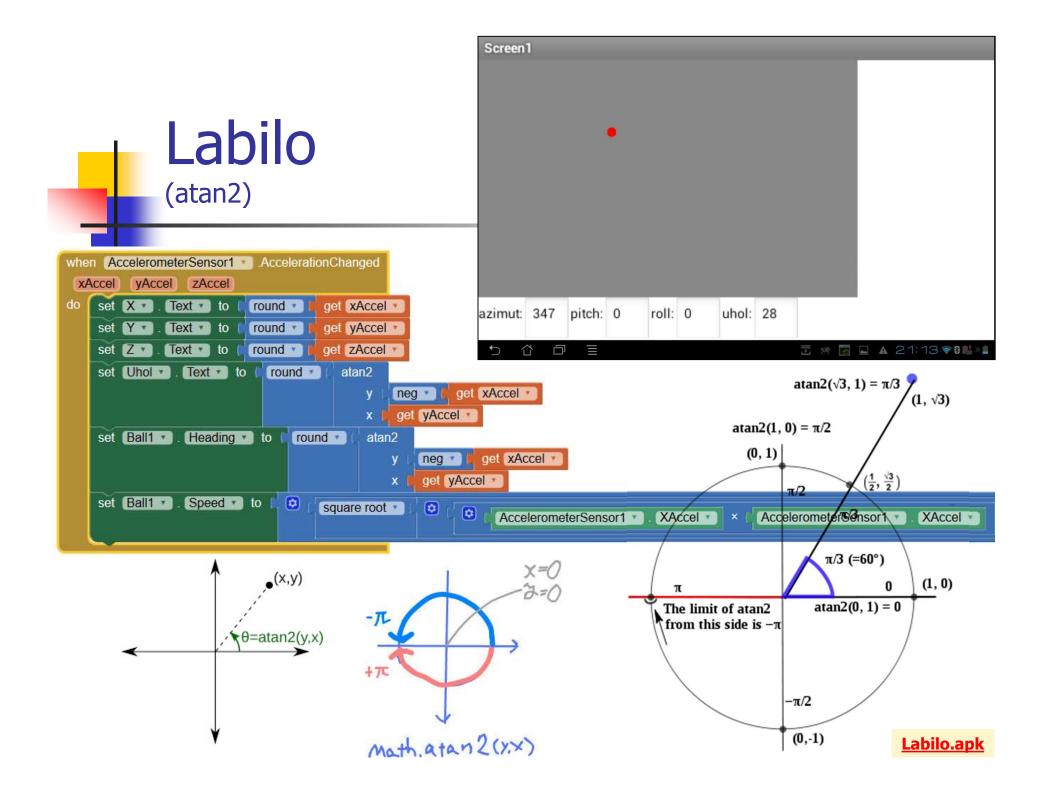


Orientácia

Orientačný senzor nájdete v každom mobile

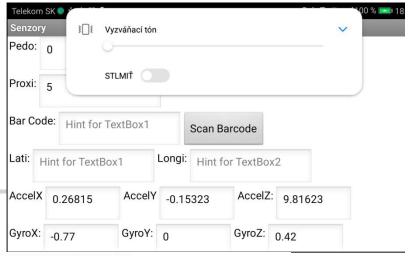
Jeho výstupom sú tri reálne čísla, pitch (X), roll (Y), yaw (Azimut)...



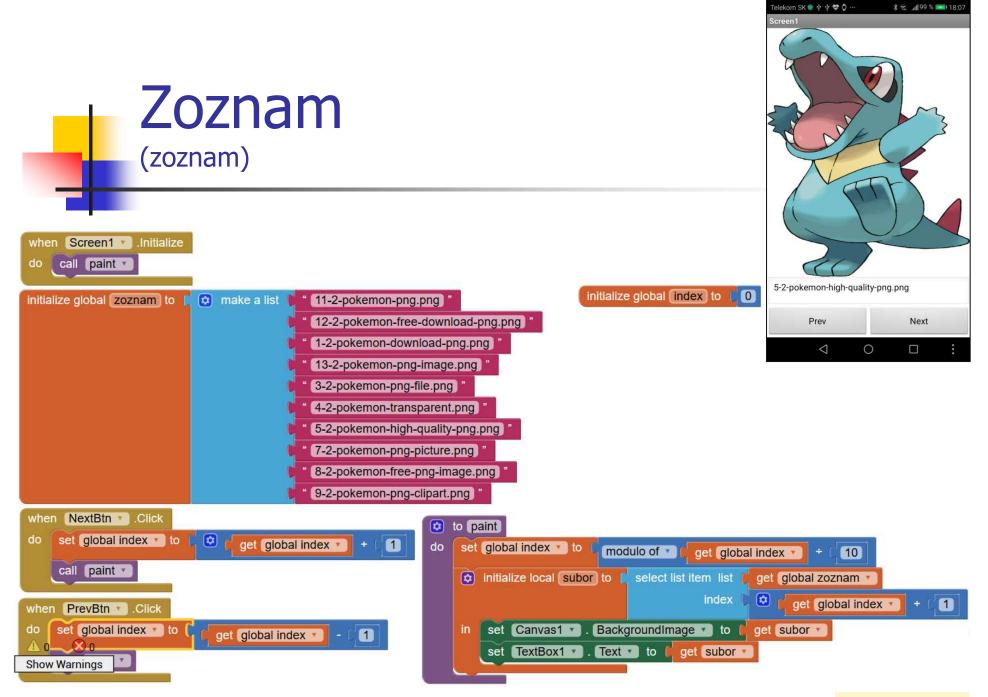


Senzory

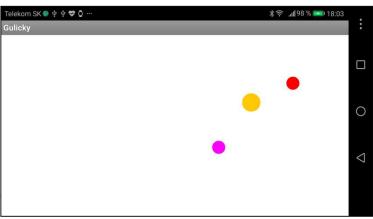
(accel, barcode, gyro, NFC, GPS, kompas, pedo, proximity)



```
when Pedometer1 StoppedMoving
                                                             when PedoResetBtn Click
               Text to Pedometer1
   set Pedo
                                          SimpleSteps *
                                                                 call Pedometer1 .Reset
                                                                 call Pedometer1 Start
when BarcodeScanner1 AfterScan
                                                             when ScanBtn Click
 result
    set BarCode
                   Text to get result
                                                                call BarcodeScanner1 .DoScan
                                                   when Clock1 Time
when ProximitySensor1 ProximityChanged
                                                  Timer has gone off.
                                                                   Text to
                                                                              Pedometer1 *
                                                                                             SimpleSteps *
 distance
   set Proxi
               Text to get distance
                                                  when GyroscopeSensor1 GyroscopeChanged
when LocationSensor1 LocationChanged
                                                   xAngularVelocity
                                                                  yAngularVelocity zAngularVelocity
                                                                                                 timestamp
 latitude
         longitude
                   altitude
                           speed
                                                      set GyroX *
                                                                   Text to
                                                                               get xAngularVelocity
              Text v to
                          get latitude
                                                      set GyroY
                                                                   Text to
                                                                               get yAngularVelocity
               Text to
    set Longi
                          get longitude
                                                      set GyroZ
                                                                   Text to
                                                                               get zAngularVelocity •
when AccelerometerSensor1 AccelerationChanged
                                                  when OrientationSensor1 OrientationChanged
       yAccel zAccel
xAccel
                                                            pitch
                                                    azimuth
                                                                  roll
    set AccelX
                 Text to
                             get xAccel *
                                                      set Azim
                                                                   Text to
                                                                              get azimuth
                 Text to
    set AccelY
                             get yAccel
                                                      set Pitch
                                                                   Text to
                                                                              get pitch
    set AccelZ
                 Text to
                             get zAccel
                                                       set Roll
                                                                             get roll
                                                                 Text to
                                                                                                                Senzory.apk
```



Zoznam objektov (for each)



```
to init
do 👩 add items to list list 🕴 get global zoznam 💌
                    item Ball1
                         Ball2
                   item Ball3
                                               foreach object in a list
   for each item in list get global zoznam
    do set Ball. X
        of component
                      get item
                      random integer from 1 1 to 400
        set Ball. Y
        of component
                      get item
                      random integer from 1 1 to 400
        set Ball. Speed V
            of component
                          get item
                         random integer from 3 to 15
        set Ball. Radius
            of component
                          get item
                          random integer from ( 5 to ( 15)
        set Ball. PaintColor
                            get item
               of component
                            pick a random item list on make a list
        set Ball. Heading
             of component
                           get item
                                Ball Heading
                                                               random integer from 30 to 30
                                  of component
                                               get item
```



TextToSpeech

- Nainštaluj eSpeak
- https://play.google.com/store/apps/details?id=com.googlecode.eyesfree.espeak&hl=sk

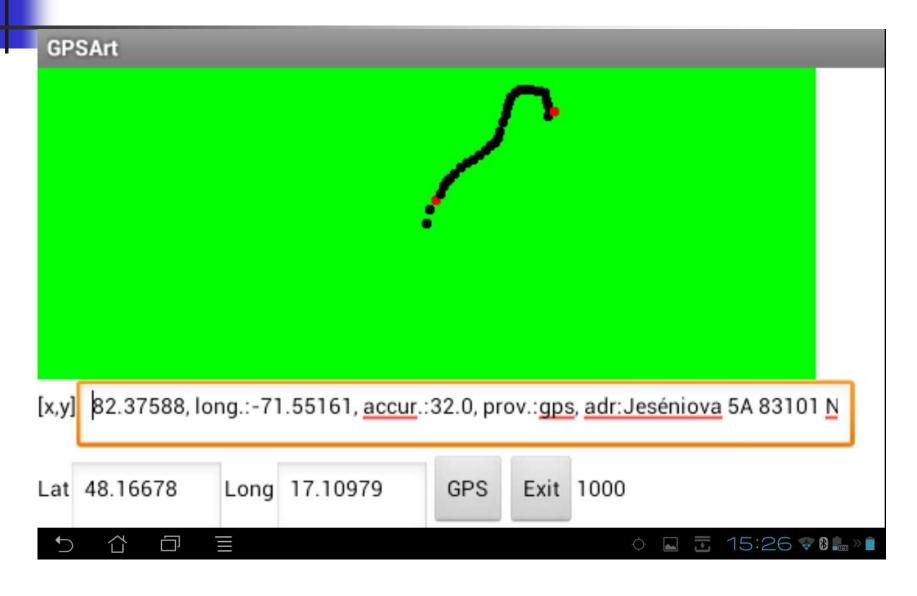
```
when HearBtn Click
do call SpeechRecognizer1 .GetText
when SpeechRecognizer1 AfterGettingText
 result
        partial
                   Text to SpeechRecognizer1
do set TextBox1
when SayBtn . Click
   set TextToSpeech1
                                        LanguageList **
                                                       Selection •
                        Language to
                        Country to CountryList
    set TextToSpeech1 *
                                                    Selection *
    call TextToSpeech1 Speak
                               TextBox1
                                           Text *
                     message
```

```
when LanguageList ... AfterPicking
   LanguageList *
                            Selection
                                            " ENG
         set CountryList . Elements . to
                                        make a list
                                                       GBR
                                                       US
   LanguageList
                            Selection *
                                            " CES
         set CountryList
                         Elements v to
                                                      CZE
                                        make a list
   LanguageList *
                            Selection *
                                            SPA
   then
         set CountryList
                         Elements v to
                                        make a list
                                                      " ESP
                                                       USA
   " DEU
              LanguageList
                            Selection •
         set CountryList
                         Elements v to
                                                       AUT
   then
                                        make a list
                                                       BEL
                                                       CHE
                                                       LIE
                                                       LUX
                                                       DEU
```

Translator

```
Screen1
                 Initialize
    set Label1 *
                   Text •
                                   slovak
                           to
when Button1
     call YandexTranslate1
                             .RequestTranslation
do
                          languageToTranslateTo
                                                 Label1 *
                                                             Text •
                                 textToTranslate
                                                 from *
                                                           Text *
     YandexTranslate1
                          .GotTranslation
 responseCode
                 translation
    set to
               Text
                           get translation •
                       to
    call Notifier1 . ShowAlert
                        notice
                                 get responseCode
                    AfterPicking
     ListPicker1 *
    set Label1 *
                    Text •
                           to
                                 ListPicker1 *
                                                Selection *
do
```

GPS Art



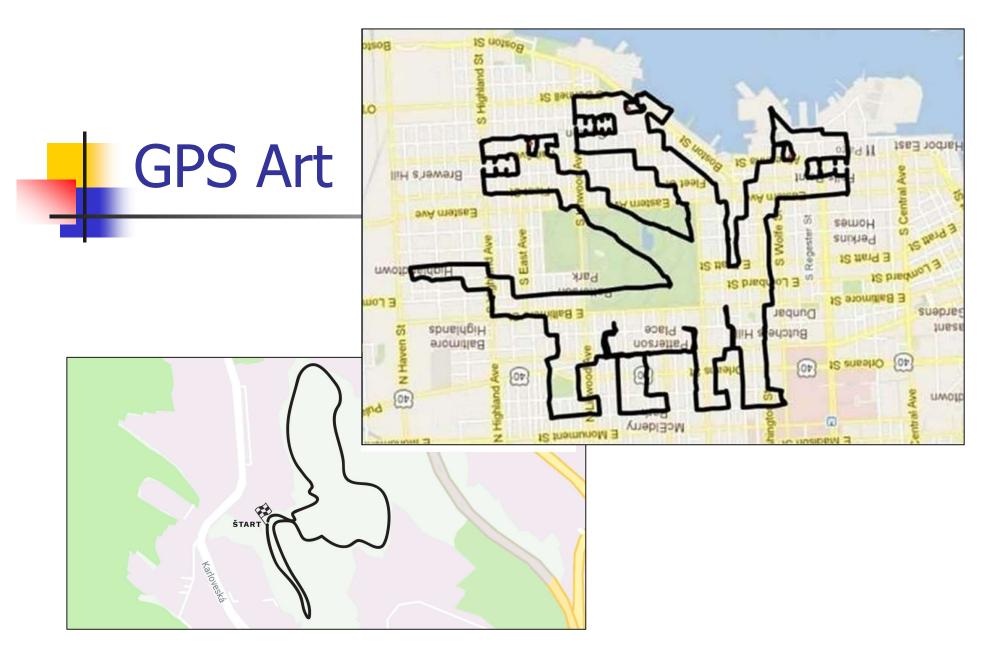




```
when Screen1 Initialize
    set LocationSensor1
                           ProviderName *
do
                                                   gps
                         Text to Initialized "
    set LblConnected v
    set LocationSensor1 *
                            TimeInterval •
                                               1000
initialize global initLat to
initialize global initLong to
when BtnExit . Click
do close screen
when Clock1
    set LocationSensor1 *
                            ProviderName *
                                                   gps "
     set Canvas1 . PaintColor . to
     call ShowPostion
                          LocationSensor1 *
                                             Latitude *
                    lat
                   long
                          LocationSensor1 *
                                             Longitude
```

```
LocationChanged
when LocationSensor1
 latitude
          longitude
                     altitude
                             speed
        Canvas1 *
                    PaintColor to
    set
    call ShowPostion
                    lat
                         get latitude
                          get longitude
                  long
when BtnGPS Click
    set Canvas1 PaintColor to
    call ShowPostion *
                         LocationSensor1 *
                                            Latitude *
                   lat
                         LocationSensor1 *
                                            Longitude
                  long
```

```
GPS Art
   to ShowPostion
                      long
                  lat
do
    set TxtLong *
                  Text to
                             get lat
       TxtLat
                           get long
                 Text *
                        to
    set LblConnected *
                       Text •
                             to LocationSensor1
                                                   TimeInterval *
    if
                                                                   0
                                          get global initLat
                   get global initLong
          set global initLat to
    then
                              get lat
         set global initLong to
                                get long
       TxtLat
                            get lat
                 Text •
                       to
       TxtLong *
                  Text to
                              get long *
    call Canvas1
                  .DrawCircle
                              centerX
                                   •
                                                                                          250
                                                                              50000
                                        get global initLat
                                                              get lat
                     centerY
                              •
                                                                                             100
                                                                                50000
                                        get global initLong
                                                              get long
                             3
                      radius
                         fill
                              true •
                                                                                        GPSArt.apk
```



https://www.facebook.com/events/1108812195979122/?active_tab=discussion



(pokračovanie)



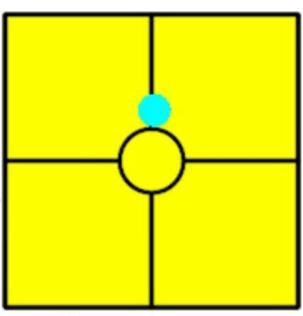


Peter Borovanský KAI, I-18

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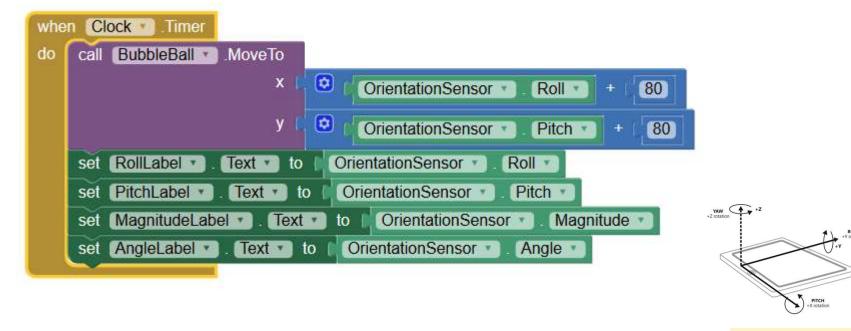
Vodovážka

Akcelerometer meria zrýchlenie (m/s²) v troch osiach (x,y,z)



Roll: 1.83868

Pitch: -30.22783



SpiritLevel.apk

Screen1

21.99883

ShockMe

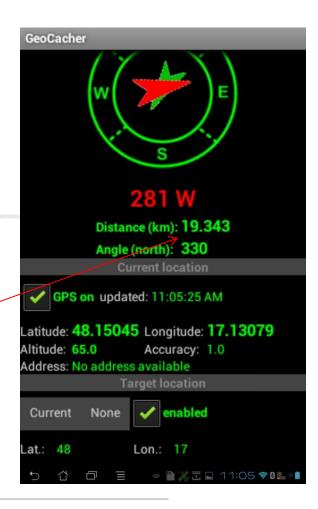
Akcelerometer meria zrýchlenie (m/s²) v troch osiach (x,y,z)

```
AccelerometerSensor1 ... AccelerationChanged
xAccel vAccel zAccel
   set global actualAcc to
                          square root *
                                        get xAccel xAccel
                                                                                             get yAccel × get yAc
   to if
              get global actualAcc > get global maxAcc >
                                 get global actualAcc *
         set Label1
                     Text to
                                                                  sqrt(x*x+y*y+(z-9.81)*(z-9.81))
         set global maxAcc to
                              get global actualAcc •
initialize global maxAcc to 0
initialize global actualAcc to 00
```

Neskôr použijeme Linear Acceleration Sensor, ktorý softwarovo počíta zrýchlenie bez gravitačného

Geochaching

Magnetický senzor meria orientáciu v magnetickom poli zeme, možeme ho použiť ako kompas Akceleračný senzor meria zrýchlenie v 3 smeroch Gyroskop meria zmenu orientácie v 3 osiach



Formulas [edit source]

Let ϕ_1, λ_1 and ϕ_2, λ_2 be the geographical latitude and longitude of two points 1 and 2, and $\Delta\phi, \Delta\lambda$ their absolute differences; then $\Delta\sigma$, the central angle between them, is given by the spherical law of cosines:

$$\Delta \sigma = \arccos \left(\sin \phi_1 \sin \phi_2 + \cos \phi_1 \cos \phi_2 \cos \Delta \lambda \right).$$

The distance d, i.e. the arc length, for a sphere of radius r and $\Delta\sigma$ given in

$$d = r \Delta \sigma$$
.

A good choice^[5] for the radius is the mean earth radius,

$$R_1 = rac{1}{3}(2a+b) pprox 6371 \, \mathrm{km}$$
 (for the WGS84 ellipsoid)





- Pair: 1234, ak nie, skúšame 0000, 00000, potom už čítame návod
- HXM012233
- Connect to serial port, napr. COM5
- Pozrieme si COM v termináli



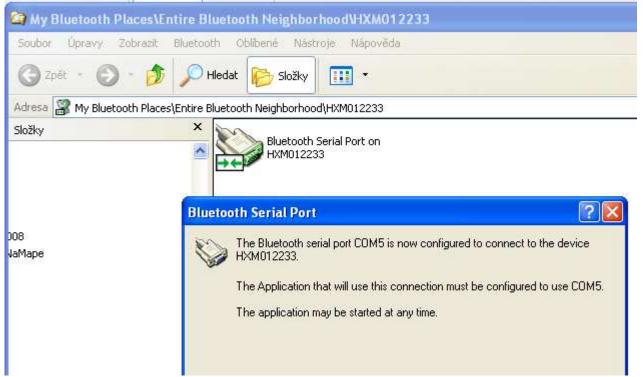




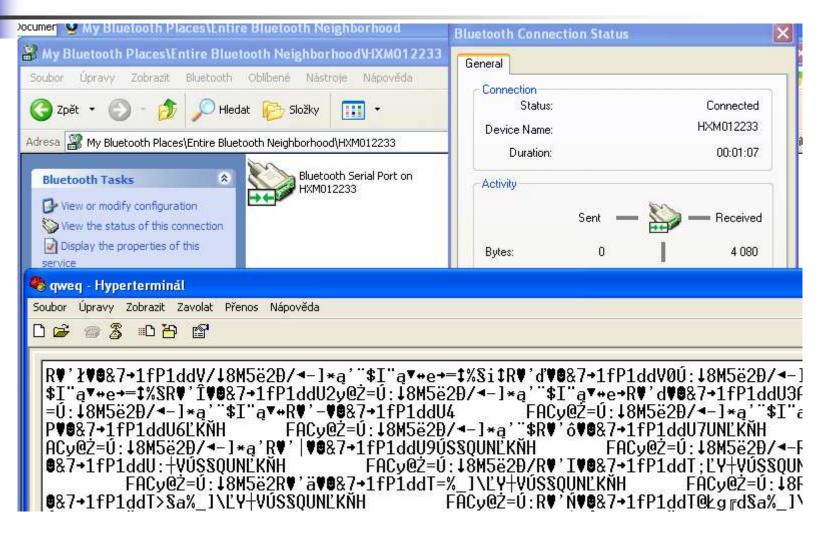




Transformer Prime TF201 Personal Digital Assistant

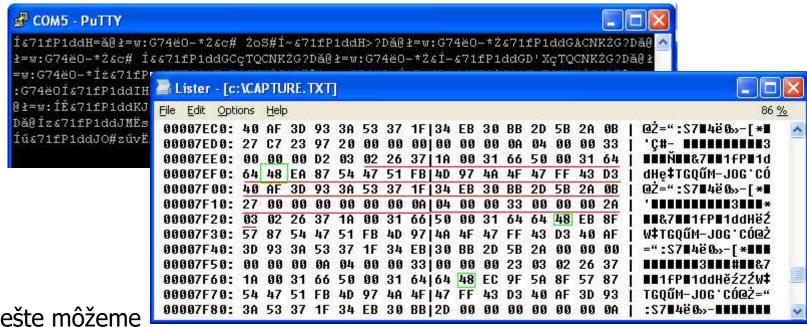


Radosť z párovania



Spárovené a rozpráva sám

Najpríjemnejšie, ak spárované zariadenie vysiela správy samé, hoc aj kódované. Ušetrí nám to študovanie komunikačného protokolu, riešenie problémov s rýchlosťou komunikácie, odozvou, a pod.



Vždy ešte môžeme čítať manuál, resp. použiť hotové API

Zephyr HxM Developer Kit

This bundled package is intended as a toolkit for implementing an API to enable communications with a Zephyr Bluetooth Heart Rate / Speed & Diotance Monitor (11xM) and provides both PC and Android resources for connecting to the device to receive live data. Click here to download (185 MB)

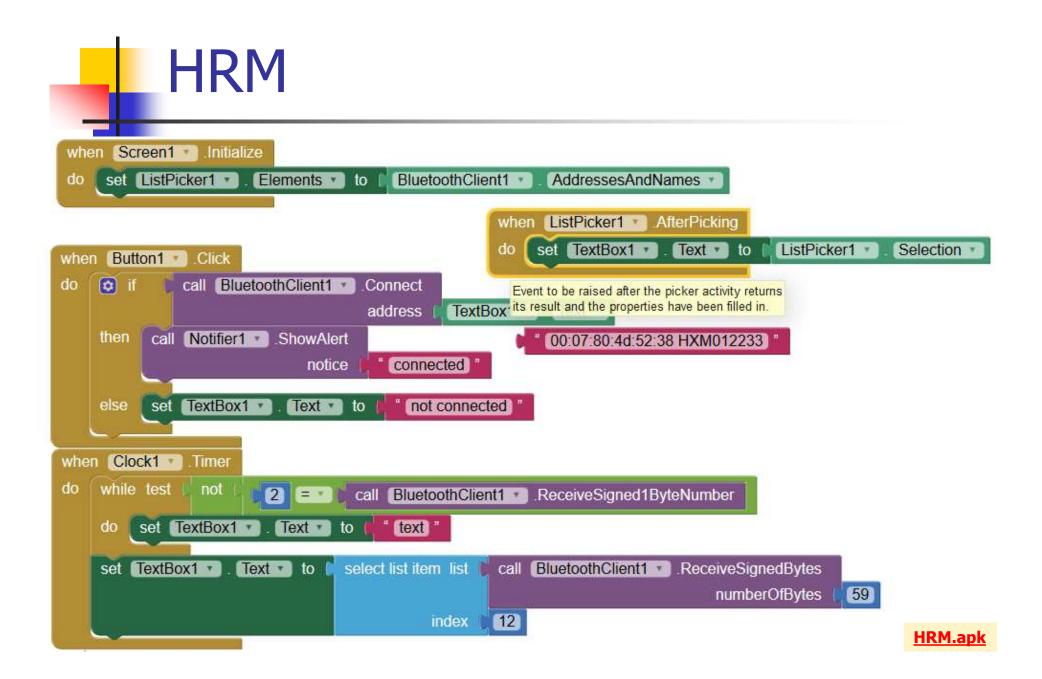
HRM (HxM Zephyr)

c:\borovan\HxM SDK 9700.0124.v1d*.*									
Name	Ext	Size	↓Date						
♠ []		<dir></dir>	17.11.2012 23:09						
[DotNetFX35SP1]	20	0 608 888	17.11.2012 23:09						
[HxM Example Android Project]		293 223	17.11.2012 23:09						
[HxM Packet Logger 9500.0030.v1f]		584 465	17.11.2012 23:09						
THxM Android API User Guide 2011-06-24	pdf	268 525	17.11.2012 23:09						
Bluetooth HXM API Guide 2011-05-05	pdf	748 453	17.11.2012 23:09						

7.1. MSG:0x26 - Heart Rate, Speed & Distance packet

This message contains the heart rate data, including the last 15 RR timestamps, and speed & distance data. The packet is transmitted periodically at 1Hz.

Byte/Bit	7	6	5	4	3	2	1	0	Field
0	STX								STX
1	0x26							Msg ID	
2	55							DLC	
3	Firmware ID								
5	Firmware Version							Ž	
7	Hardware ID								
9	Hardware Version								
11	Battery Charge Indicator								
12	Heart Rate								8
13	Heart Beat Number								
14	Heart Beat Timestamp #1 (Newest)								
16	Heart Beat Timestamp #2								
18									





```
when Screen1 Initialize
    set NearField1 * ReadMode *
                                  to true
    ▲ set NearField, ReadMode ▼
                   of component
                                 NearField1 *
                                 true *
                             to
when NearField1 *
                  TagRead
 message
    call Notifier1 .LogInfo
                 message
                            get message *
    set TextBox1
                    Text *
                           to get message
when Button1 Click
    set NearField. ReadMode
                                  NearField1 *
                   of component
                                 false
                             to
    set NearField1 *
                      ReadMode *
                                       false *
    set NearField1 *
                      TextToWrite *
                                        TextBox1
                                                    Text *
when NearField1
                   TagWritten
     call Notifier1 .LogInfo
                              written
                  message
```

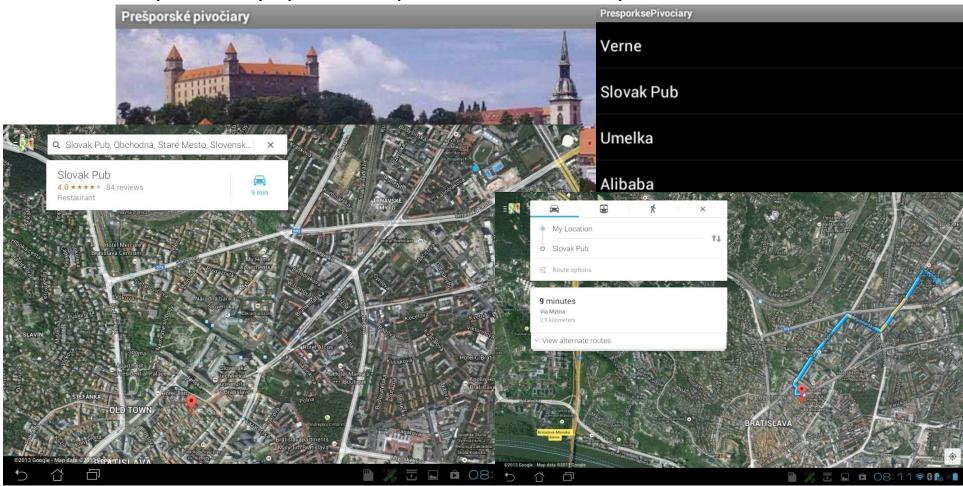
NFC



Prešporské pivočiary

ilustrácia ActivityStarter

Malý turistický sprievodca pamiatkami Bratislavy



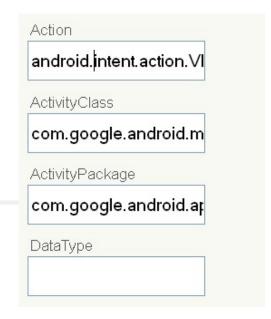
ActivityStarter

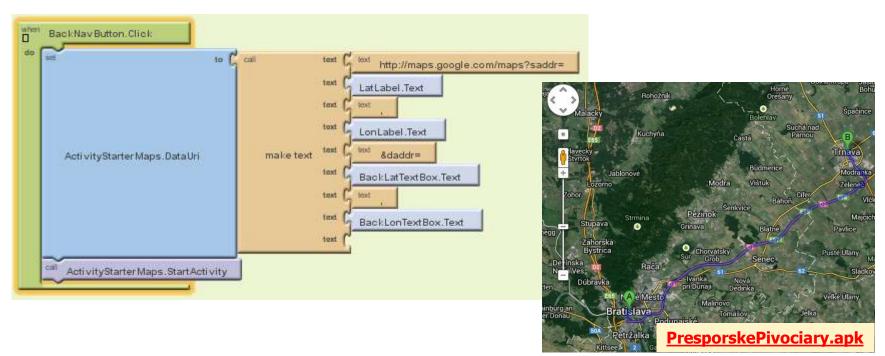
(google.maps)

Action: android.intent.action.VIEW

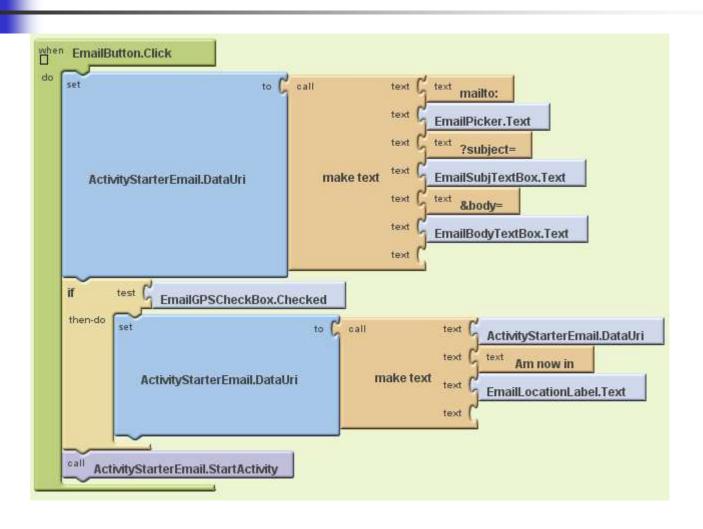
- ActivityClass: com.google.android.maps.MapsActivity
- ActivityPackage: com.google.android.apps.maps
- DataUri: http://maps.google.com///?saddr=...&daddr=...

napr.: https://maps.google.com/?saddr=bratislava&daddr=trnava

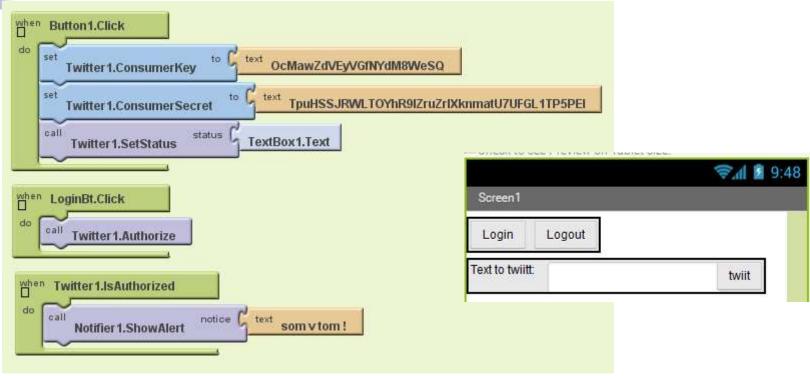




ActivityStarter: mailto



Twitter



Aplikáciu treba zaregistrovať na

https://dev.twitter.com/

http://twitter.com/oauth_clients/new

Sign out

Q

app.twitter.com

Application Details

https://apps.twitter.com/ Name: *

Twiitingo

Description: *

prvy pokus

Your application description, which will be shown in

Website: *

http://dai.fmph.uniba.sk/courses/VMA/

Your application's publicly accessible home page, wh

Your application name. This is used to attribute the sc Application Type

Access:

- Read only
- O Read and Write
- Read, Write and Access direct messages

What type of access does your application need? Note: @Anywhere applications require read & write access. Find out more about our Application Permission Model.

OAuth Settings

Consumer key: *

OcMawZdVEyVGfNYdM8WeSQ

Consumer secret: *

TpuHSSJRWLTOYhR9IZruZrlXknmatU7UFGL1TP5PEI

Remember this should not be shared.

Callback URL:

http://twitter.com

Where should we return after successfully authenticating? For @Anywhere applications, only the domain specified in the call specify their oauth callback URL on the request token step, regardless of the value given here. To restrict your application

Allow this application to be used to Sign in with Twitter

Social Sharing

```
9:48
                                                                   Screen1
when Button1 Click
                                                                  cislo
                                         cislotb *
                    PhoneNumber *
                                                    Text *
    set Texting1
                                    to I
                                     msgtb
    set Texting1 *
                    Message to
                                               Text
                                                                  Text SMS
    call Texting1 . SendMessage
                                                                   Posli
                                                                   Zdielaj obrazok
     Texting1 MessageReceived
                                                                   Text for ImagePicker1
          messageText
 number
    set cislotb v
                                get number *
                   Text •
    set msgtb *
                   Text *
                                get messageText *
                          to
when Button2 Click
                   Picture to I ImagePicker1
                                                   Image *
     set Image1
     call Sharing1 . ShareFileWithMessage
                                     file
                                             /storage/sdcard0/Appinventor/assets/ANDROID.png
                                             omg!
                                message
     call Notifier1 . ShowAlert
                                  a je to tam
                       notice
```

Phone

```
9:48
                                when Button1 . Click
Screen1
                                                          PhoneNumber *
                                                                                  0911775039
                                     set PhoneCall1
                                                                            to
Text for ContactPicker1
                                     call PhoneCall1
                                                         .MakePhoneCall
Text for PhoneNumberPicker1
Call Me
Text Me
                                 when Button2
                                                   Click
                                                        PhoneNumber *
                                                                                 0911775039
                                 do
                                      set Texting1
                                                                          0918972645
                                          Texting1 *
                                                       Message to
                                                       .SendMessage
                                      call Texting1
                      IJ
    Ĵ
       Non-visible components
         PhoneCall1 Texting1
```



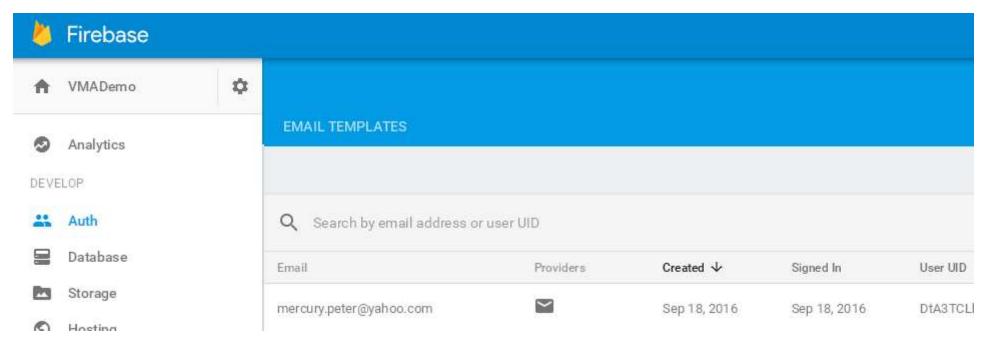
https://firebase.google.com/

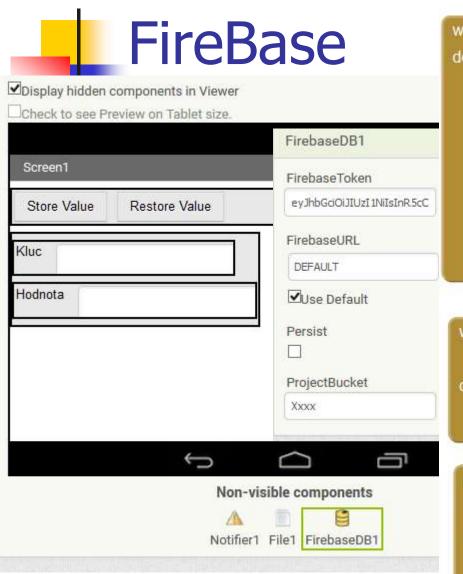
Cloud vlastnený Google od 2014

- Firebase Cloud Messaging
- Firebase Auth
- •Realtime Database
- •Firebase Storage
- Firebase Web Hosting
- •Firebase Remote Config
- Firebase Test Lab for Android
- Crash Reporting



FireBaseConsole





```
when Button1 Click
    call Notifier1
                    .ShowAlert
                        notice
                                   going to store a value to fireba
    call FirebaseDB1
                         .StoreValue
                                      Keytxt •
                                                 Text *
                                tag
                       valueToStore
                                      ValueTxt
                                                   Text •
    call FirebaseDB1
                         .GetValue
                                               Text •
                                    Keytxt *
                              tag
               valuelfTagNotThere
                                      nic tam nie je
       FirebaseDB1 *
                      DataChanged
when
  tag
        value
     call Notifier1
                     .ShowAlert
                         notice
                                  get value *
       FirebaseDB1 *
                       GotValue
 when
         value
   tag
 do
      call Notifier1
                      ShowAlert
                          notice
                                   get value
      set ValueTxt
                       Text
                                    get value
                               to
                                         Xxxx.aia, Xxxx.apk
```

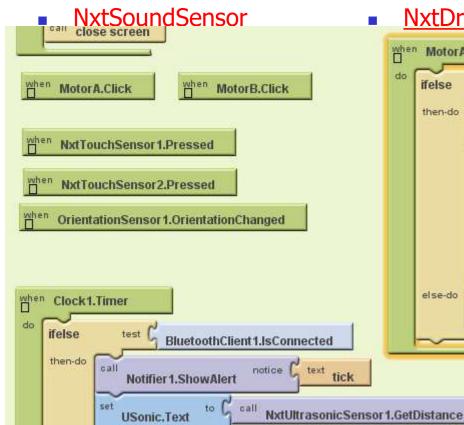


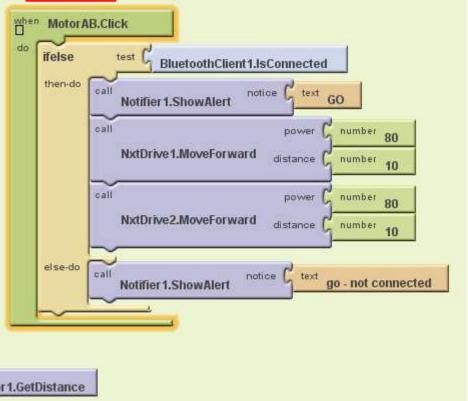
- **NxtColorSensor**
- **NxtLightSensor**

- **NxtTouchSensor**
- **NxtUltrasonicSensor**

NxtDrive

NxtLightSensor1.GetLightLevel







next.aia, next.apk





Ak vás niečo netriviálne napadne (príklad: Prešporské Pivočiary :-), skúste to vytvoriť, ale tak, že sa za to nebudete hanbiť, hodnotí to Michal Kováč.

Ak nie:

- Labilo
 - dorobiť na niečo ako vodováhu
- GPSArt
 - Kreslí čiary, nie bodky
 - Plocha obrázku sa škáluje podľa reálne prejdenej vzdialenosti
 - Má Pause na prerušenie maľovania za účelom presunu
 - Vie uložiť obrázok
 - Nakreslí sever
- HRM
 - Grafické zobrazenie
 - Priebeh, vývoj
- NXT-EV3
 - Čokoľvek pekné (segway :-)

