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The Future of Software Engineering on Mobile Devices

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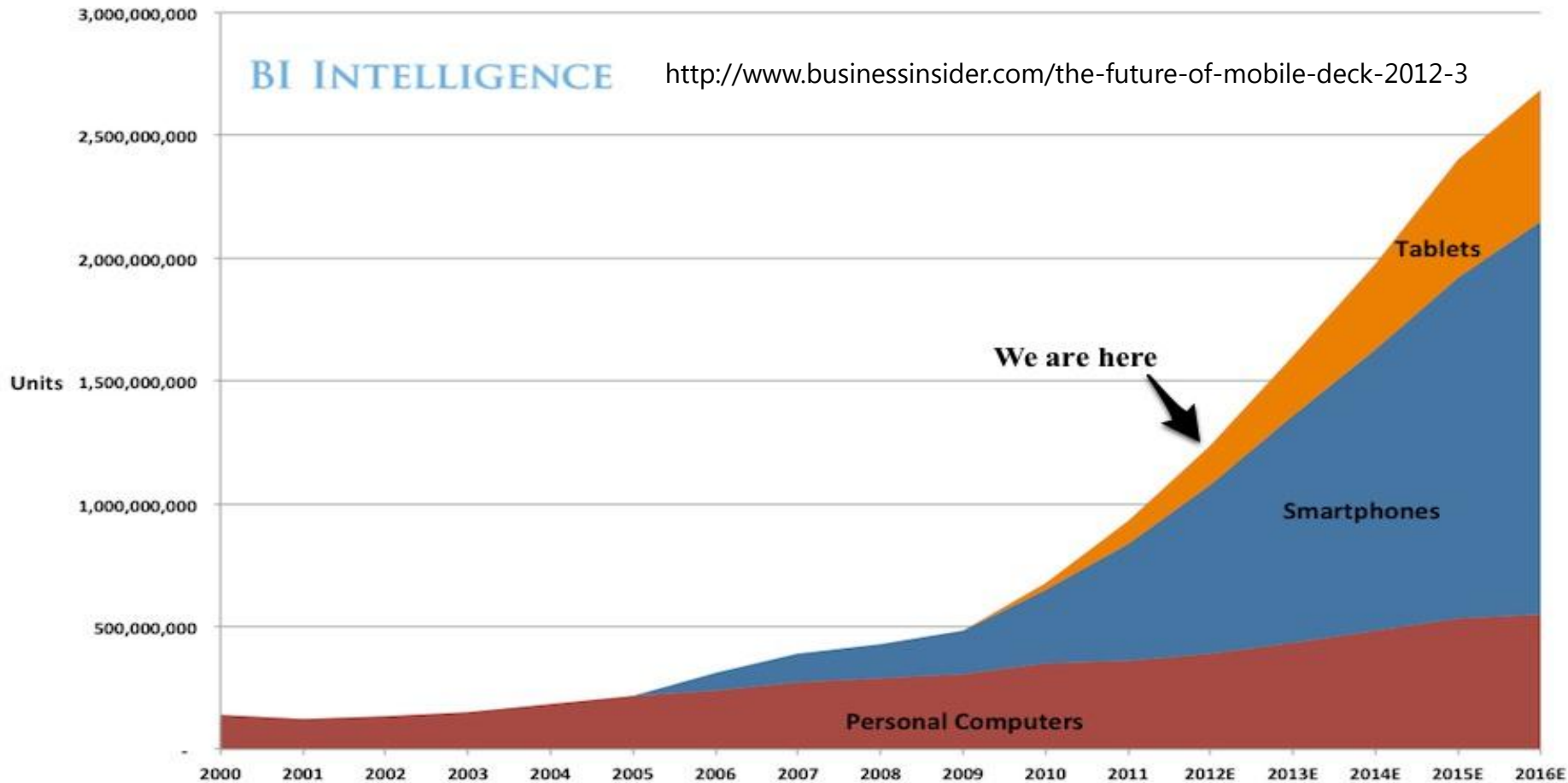
5/24/2012





technology shift

Global Internet Device Sales



Source: Gartner, IDC, Strategy Analytics, company filings, BI Intelligence estimates



technology shift

smartphones outsell PCs

smartphones might be first and possibly only computing device for many people

smartphones perform many common PC tasks



smartphone specs

	iPhone 4	minimum Windows Phone 7 specs
Processor	?	800 Mhz
Display	960x640	800x480
Memory	512 MB	256 MB
"Disk"	16-64 GB	8 GB

more than your PC:

hardware-accelerated graphics,
touchscreen

WiFi, cellular (GSM 3G or CDMA),
bluetooth

high-resolution camera(s)

GPS, accelerometer, gyroscope,
compass, ambient light sensor,
proximity sensor, FM tuner, ...



smartphone uses

text messaging

taking photos

internet browsing

emailing

downloading apps

gaming

social networking

navigating

watching video

...

what's not on the list?

writing code, creating apps!

walled garden

many platforms only allow user to run apps from vetted "app store" or "Marketplace"

have you already tried to create a mobile app?



script your phone with **touchdevelop**

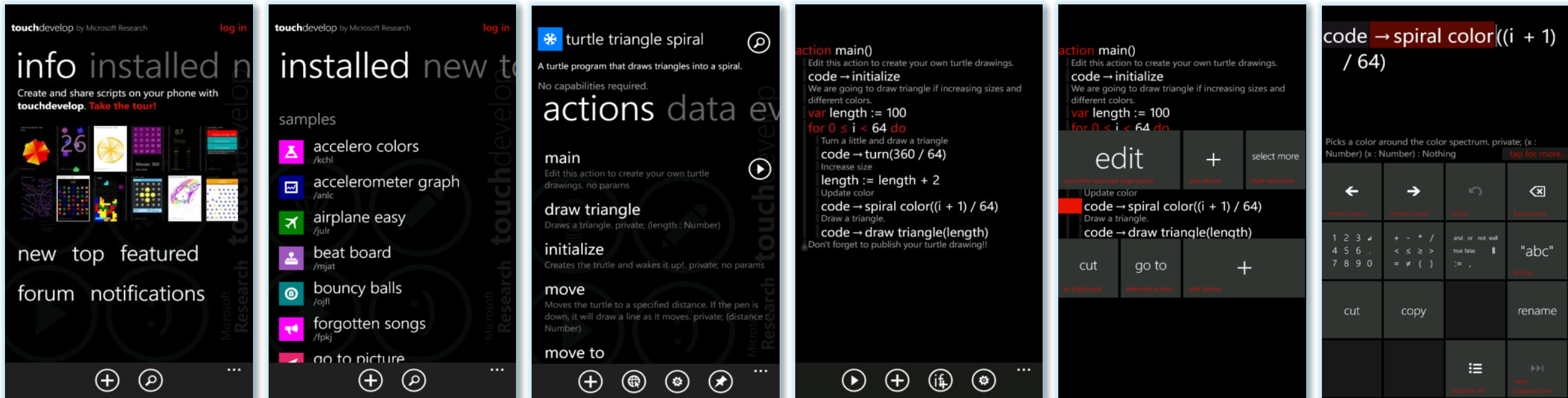


bringing the joy
of programming
from early computers
to modern mobile devices



```
***** COMMODORE 64 BASIC V2 *****
64K RAM SYSTEM  38911 BASIC BYTES FREE
READY.
10 PRINT "HELLO WORLD"
20 GOTO 10
RUN
```


a touch-based IDE in your pocket



touchdevelop is an app to create, share, run scripts everything happens on your phone – no PC required!

touchdevelop

demo

introduction to Windows Phone

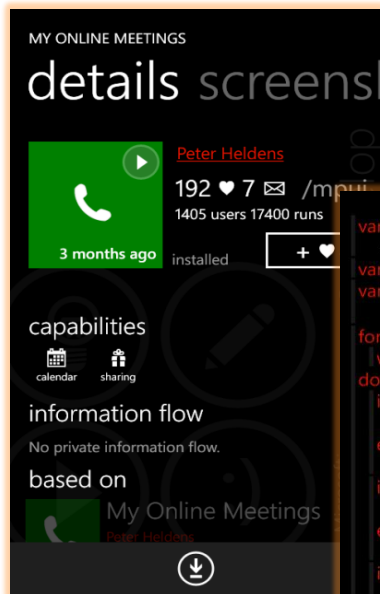
introduction to **touch**develop app

basic program editing

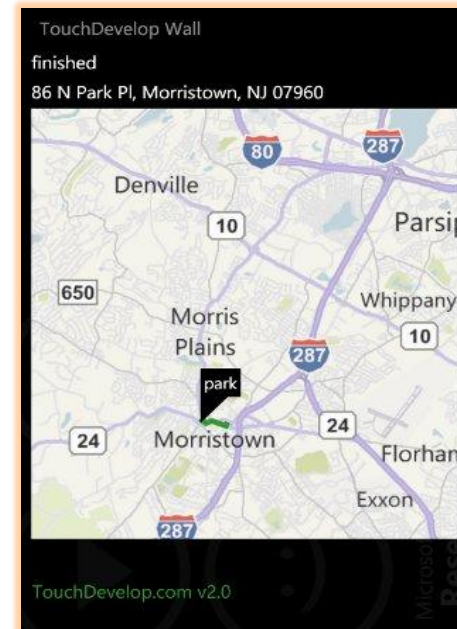
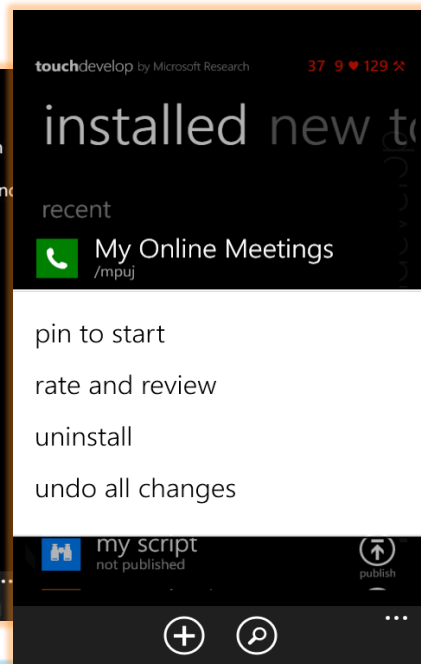
song shaker

...tools

5,000+ scripts written by **touchdevelop** users



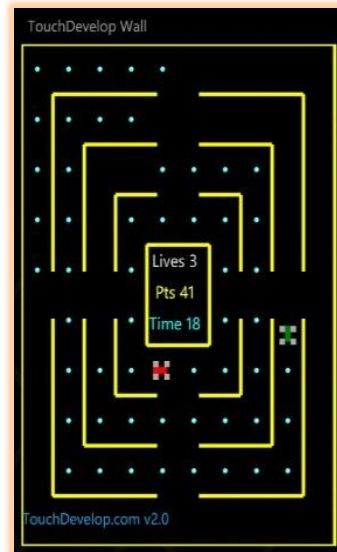
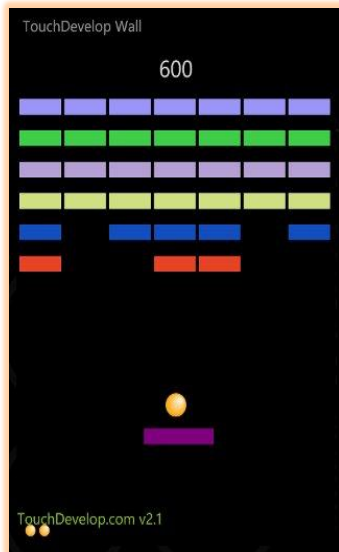
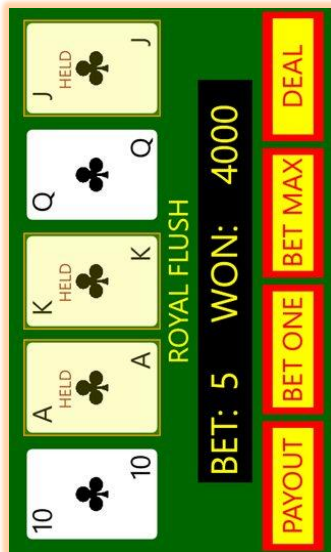
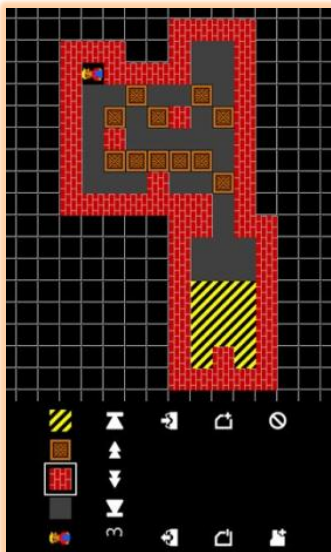
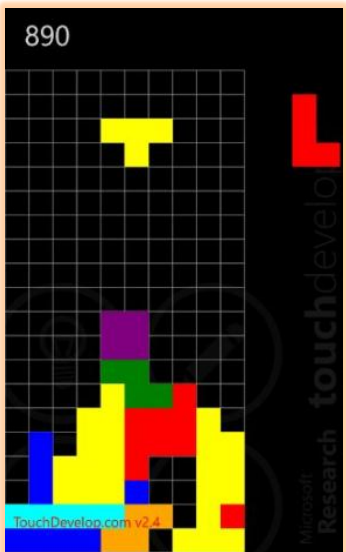
```
var t1 := "Today's Virtual"... || ☐
sLeaderName
var t2 := "Select session "... || ☐ dialin
var appointments := social
→ search appointments(start, end)
for each a1 in appointments
  where true
  do
    if a1 → subject → is invalid then
      subject := "subject not spe"...
    else
      subject := a1 → subject
    if a1 → location → is invalid then
      location := "location not sp"...
    else
      location := a1 → location
    if (a1 → details → is invalid) then
      No meeting details
    else
      s, validConfID := ▷
        getConfID Regex(a1)
      if not validConfID then
        No ConferanceID found
```





...games

5,000+ scripts written by **touchdevelop** users



touchdevelop

demo

scripts written by users



it's fun!

engaging experience

work with your personal data (pictures, songs, ...)

create games, tools, automate tasks

on the go

great for teaching





language+editor

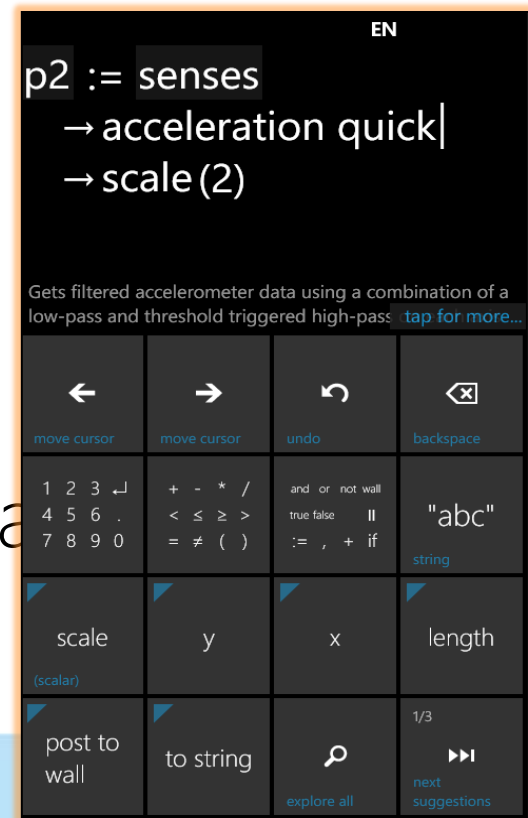
typed language + semi-structured editor

powerful language (not just for games)

auto-completion based on crowd-sourcing

imperative, procedural, datastructures

...and yet somewhat different from all other languages a





available APIs

all phone features are available via **touchdevelop**

camera, touch, accelerometer,
compass, gyroscope, microphone, ...

contacts, calendar, email, pictures, songs, ...

web queries, search, maps, social networks

graphics with physics engine

tiles



script sharing

script bazaar

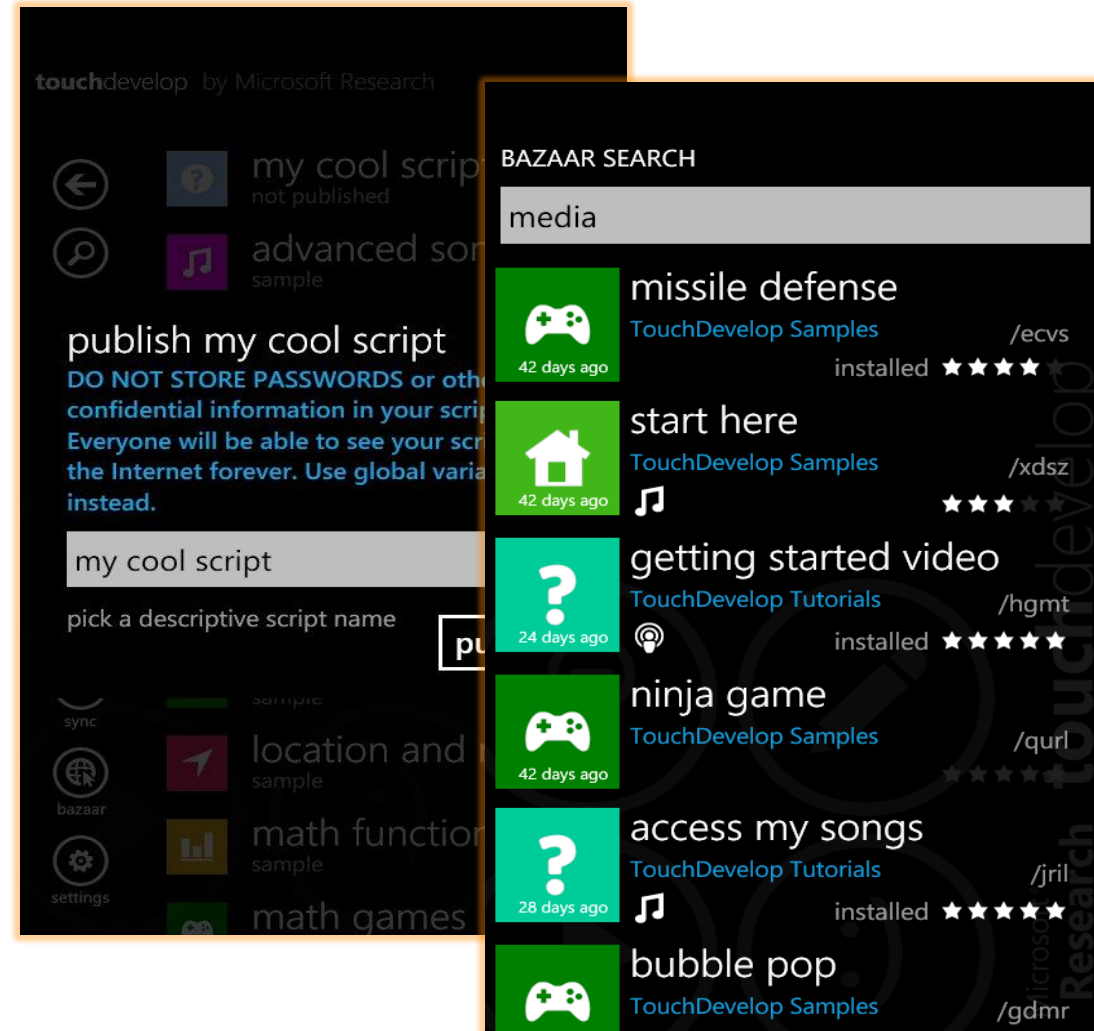
central authority in cloud

anyone can publish scripts

you can discover other scripts

scripts come with source code

all published scripts are automatically analyzed for privacy concerns





social

programming: a social experience

user profile

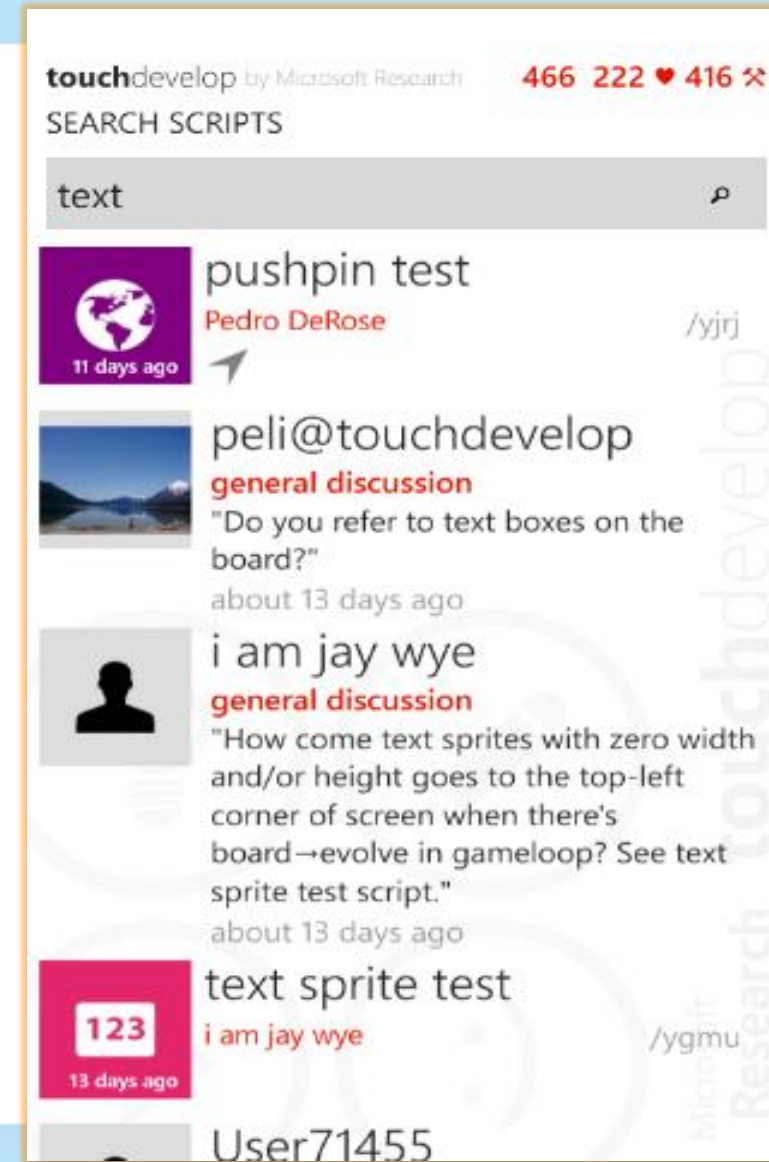
discuss in forum

review

screenshots

give ♥ to scripts

notifications





the alternatives...

PC – legacy development model

Android: AIDE, App Inventor, ...

iOS: Codea

mobile development environments are becoming popular on all platforms

only **touch**develop embraces new devices (touchscreen, editor, language, social)



... and back to **touch**develop

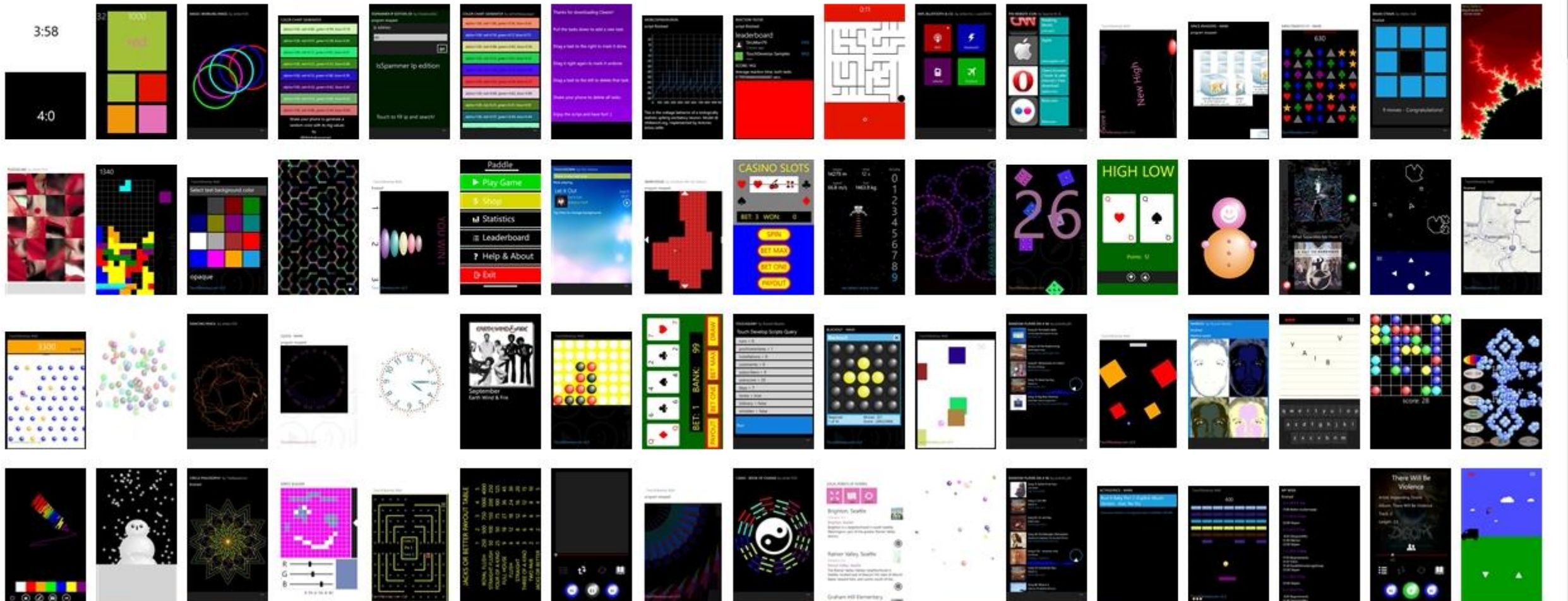
resources for learning and teaching

how to become famous and get rich

beyond phones



search





book + slides



available free online

touchdevelop.com/book

touchdevelop.com/slides

introduction to programming on a phone

how to use app + editor + language

for teachers + students



need phones?

University Phone Loan Program for **touch**develop

are you interested in using **touch**develop for teaching...

basic programming concepts?

mobile computing classes?

compiler and languages classes?

investigating the **touch**develop language?

loan program: get Windows Phones for a semester.

how to apply: touchdevelop.com/teach

sell apps ... get rich



submit your scripts as real apps
to Windows Phone Marketplace!

requires App Hub developer account (free for students via [Dreamspark](#))
app needs to pass regular certification process on App Hub

[Learn more...](#)



app download

step 2: download app and screenshots

2.1: download app
save this file on your disk: `TouchDevelop_mpuj.xap`

2.2: download screenshots
you will

Do you want to open or save TouchDevelop_mpuj.xap (1.27 MB) from www.touchdevelop.com?

Open Save Cancel

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beyond phones





research opportunities...

user interfaces

clone analysis

privacy concerns

plug-ins

distributed state, distributed execution



reception

touchdevelop is popular (released April 2011)

> 180K app downloads; in top 1% of all apps (out of 80,000) of Windows Phone Marketplace
rated 4.5/5 by users

great for learning

it's fun! immediate feedback. show your friends what you do on your phone
manipulate your own data (songs, pictures, etc.)

embraces new reality

language and editor optimized for touchscreen
first-class access to all sensors and services
sharing and learning with friends in the cloud



questions?



touchdevelop.com

research.microsoft.com/touchdevelop