Intro to Mobile (Distributed Computing)

ESCOLA D'ENGINYERIA. UAB

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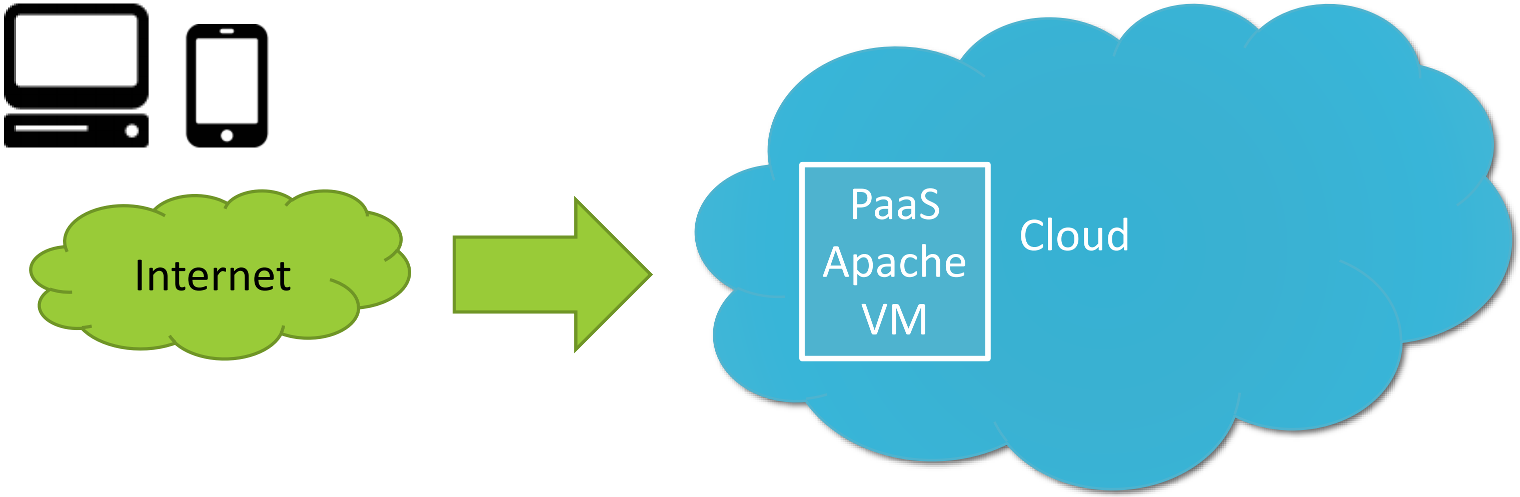
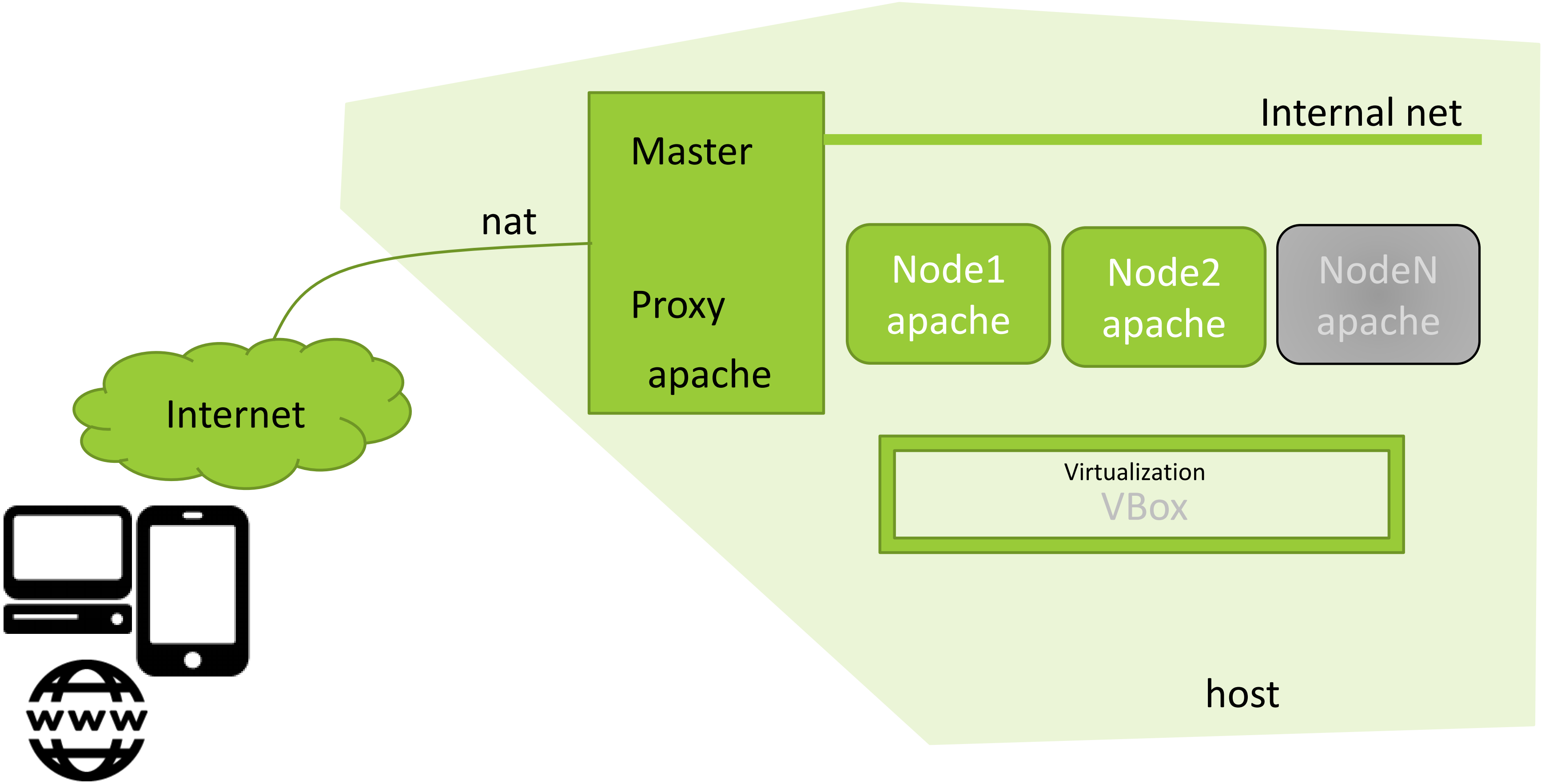
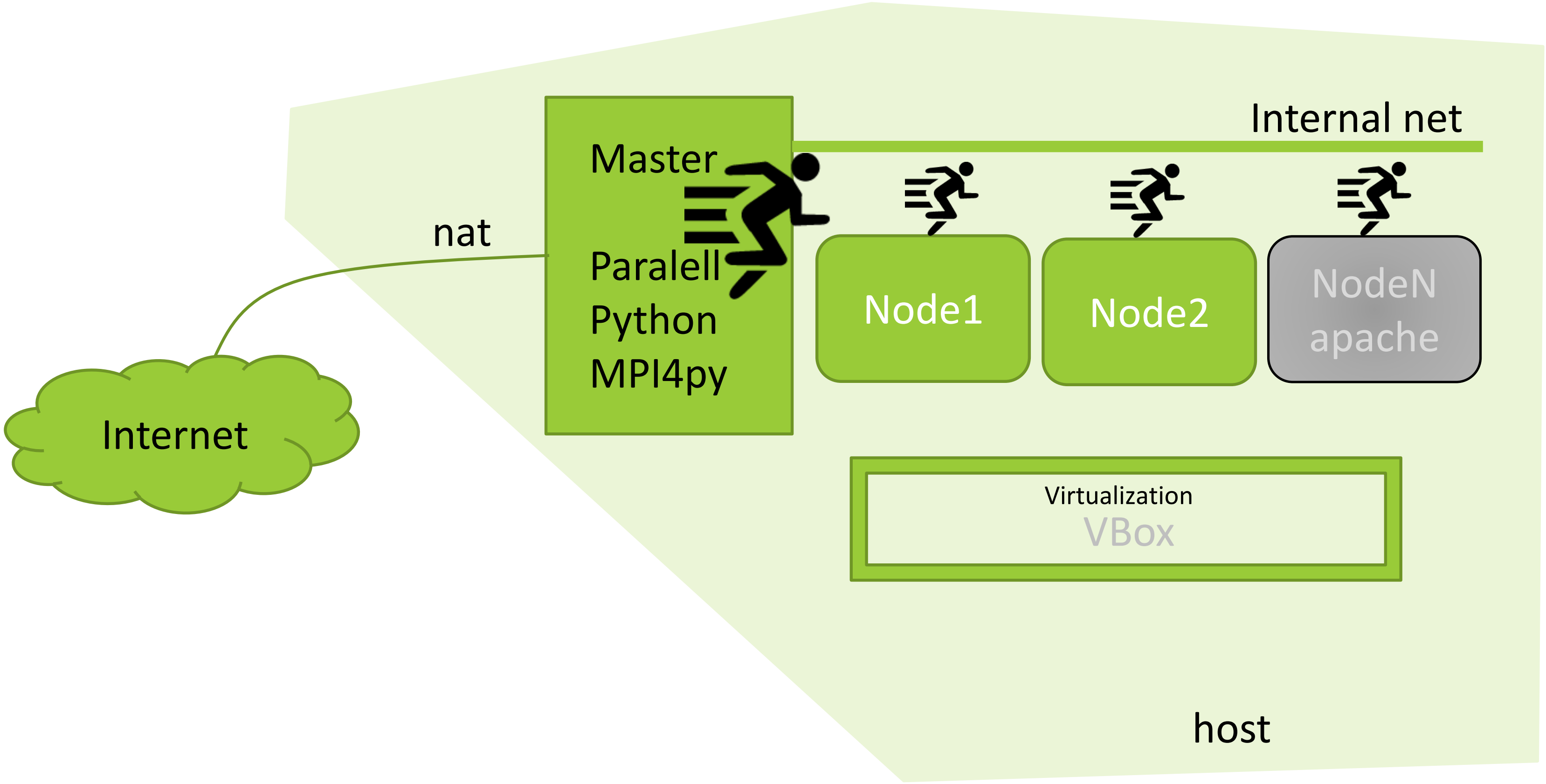
Preliminary Lab



1st Lab


Internal net
Master
Proxy
apache
nat
Node1
apache
Node2
apache
NodeN
apache
Internet
Virtualization
VBox
host

2nd Lab



Internal net

nat

Master

Paralell

Python

MPI4py

Node1

Node2

NodeN

apache

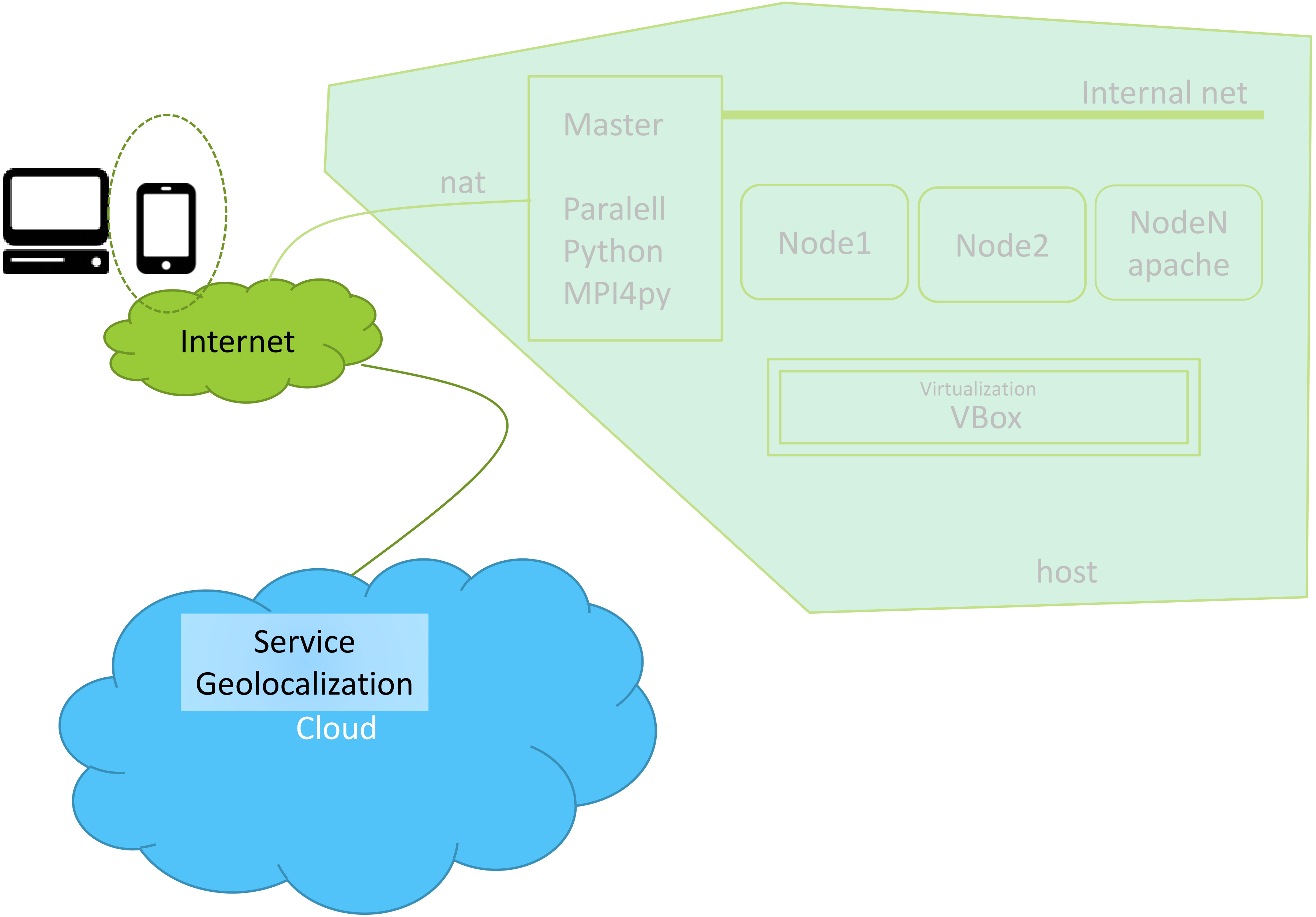
Internet

Virtualization

VBox

host

3rd Lab

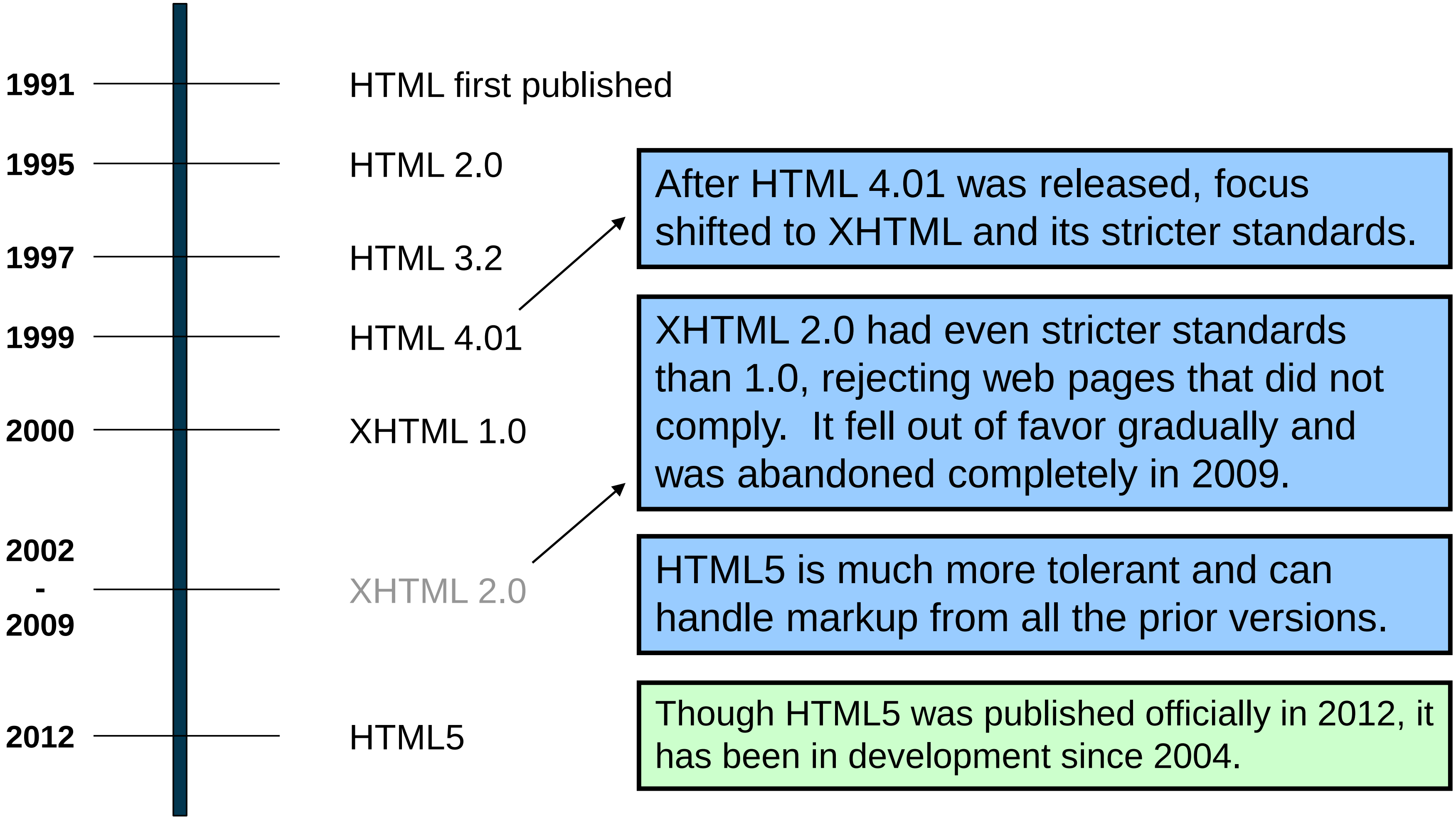

Internal net
Master
nat
Paralell
Python
MPI4py
Node1
Node2
NodeN
apache
Virtualization
VBox
host
Internet
Service
Geolocalization
Cloud

Overview

HTML5 + CCS 3.0 + Javascript (useful for desktop also)

Mobile Apps (appInventor)

Introduction: HTML5 + CSS3



1991 HTML first published

1995 HTML 2.0

1997 HTML 3.2

1999 HTML 4.01

2000 XHTML 1.0

2002 - 2009 XHTML 2.0

2012 HTML5

After HTML 4.01 was released, focus shifted to XHTML and its stricter standards.

XHTML 2.0 had even stricter standards than 1.0, rejecting web pages that did not comply. It fell out of favor gradually and was abandoned completely in 2009.

HTML5 is much more tolerant and can handle markup from all the prior versions.

Though HTML5 was published officially in 2012, it has been in development since 2004.

HTML5 + CSS3

- HTML5 is the newest version of HTML, only recently gaining partial support by the makers of web browsers.
- It incorporates all features from earlier versions of HTML, including the stricter XHTML.
- It adds a diverse set of new tools for the web developer to use.
- It is still a work in progress. No browsers have full HTML5 support. It will be many years – perhaps not until 2017 or later - before being fully defined and supported.

HTML5 + CSS3

- Support all existing web pages. With HTML5, there is no requirement to go back and revise older websites.
- Reduce the need for external plugins and scripts to show website content.
- Improve the semantic definition (i.e. meaning and purpose) of page elements.
- Make the rendering of web content universal and independent of the device being used.
- Handle web documents errors in a better and more consistent fashion.

New elements HTML5

<article>
<aside>
<audio>
<canvas>
<datalist>
<figure>
<figcaption>
<footer>
<header>
<hgroup>
<mark>
<nav>
<progress>
<section>
<source>
<svg>
<time>
<video>

These are just some of the new elements introduced in HTML5.

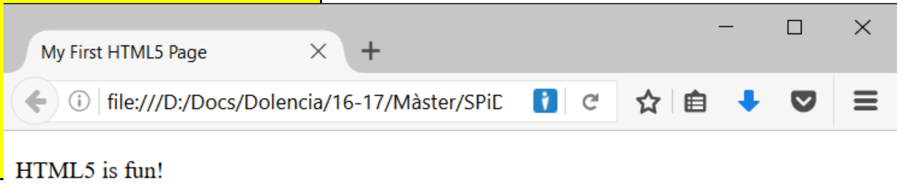
New elements HTML5

- Built-in audio and video support (without plugins)
- Enhanced form controls and attributes
- The Canvas (a way to draw directly on a web page)
- Drag and Drop functionality
- Support for CSS3 (the newer and more powerful version of CSS), DOM, and JavaScript
- More advanced features for web developers, such as data storage and offline applications.
- Reduce the need for external plugins
- HTML5 should be device independent
- Dev process should be visible to the public

News elements HTML5

First complete web page in HTML5:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>My First HTML5 Page</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
  <p>HTML5 is fun!</p>
</body>
</html>
```



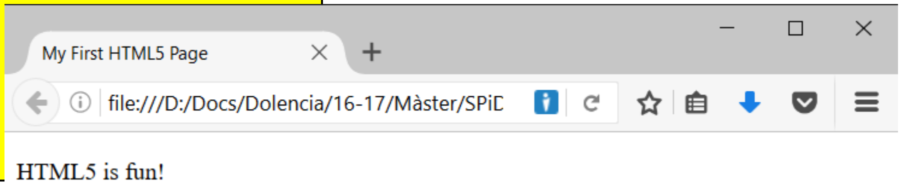
HTML5 is fun!

http://diveintohtml5.info/table-of-contents.html#detect

New elements HTML5

First complete web page in HTML5:

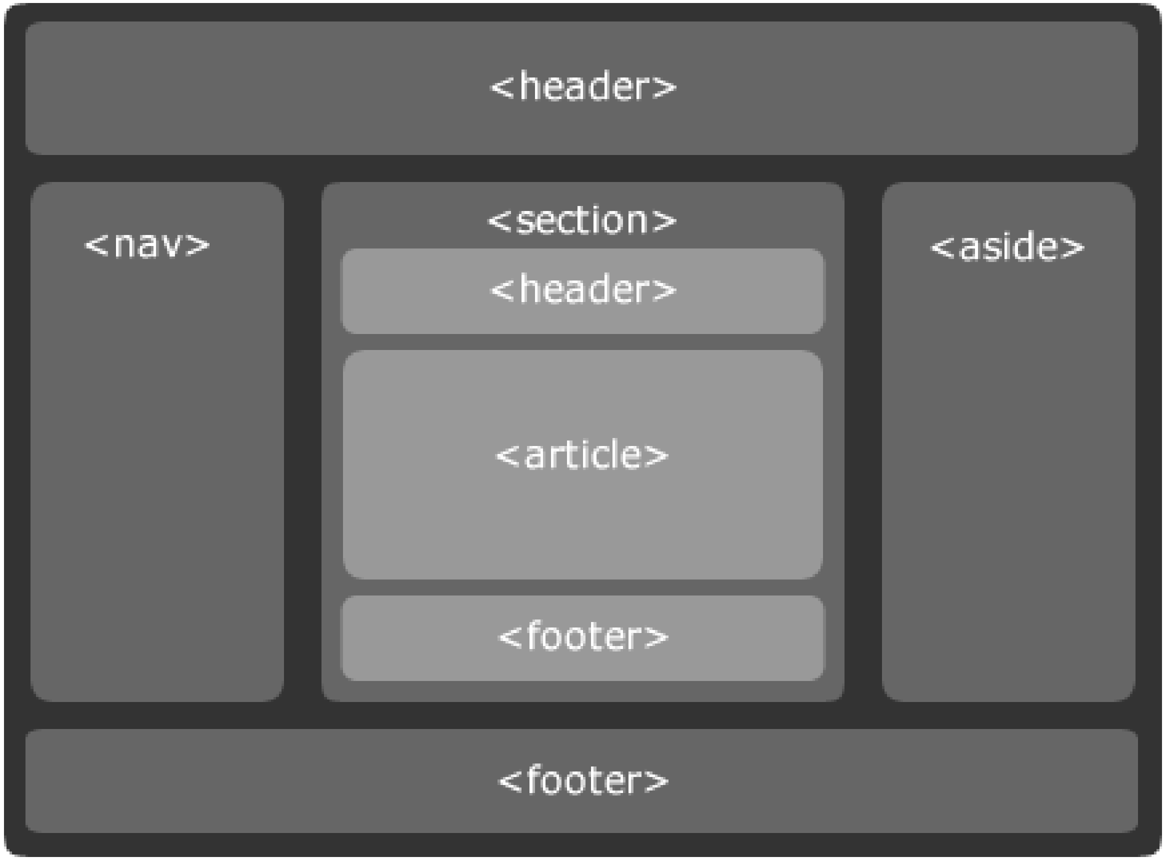
```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>My First HTML5 Page</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
  <p>HTML5 is fun!</p>
</body>
</html>
```



HTML5 is fun!

1-page.html

News elements HTML5



http://diveintohtml5.info/table-of-contents.html#detect

Complete Web Page

```
<!doctype html>
<html>
<head>
        <meta charset="utf-8">
        <title>Lenore CV</title>
        <link href='http://fonts.googleapis.com/css?family=Open+Sans' rel='stylesheet' type='text/css'>

        <style type="text/css">
                .modA { border-radius: 24px; box-shadow: -5px -5px 5px #888; }
                p {font-family: 'Open Sans'}
                h1 {font-family: 'Open Sans'}
                .caja{padding: 10px; margin: 10px; float: left;text-align: left;padding: 10px;background-color: #000;border: 1px solid #000;font-family:'Open Sans'}
                .caja .izq {float: left;}
                .caja .fin {display: block;clear: both;}
                #caja1 { height: 220px; width: 220px; margin: 10px; float: right; text-align: left; padding: 10px; background-color: #F2FFFF; border: 1px solid #000; font-family: 'Open Sans' border-radius: 24px; box-shadow: -5px -5px 5px #888;}
                #caja2 { border-radius: 24px; box-shadow: -5px -5px 5px #988; width: 70%; height: 100%; margin: 10px; text-align: left; padding: 10px; background-color: #F2F2F2; border: 2px solid #000; font-family: 'Open Sans'}
                #caja3 { height: 220px; width: 220px; margin: 10px; float: left; text-align: left; padding: 10px; background-color: #F2FFFF; border: 1px solid #000; font-family: 'Open Sans' border-radius: 24px; box-shadow: -5px -5px 5px #888;}
                #separado { margin: 5px; text-align: left; padding: 5px; clear:both; display: block; font-family: 'Open Sans'}

                #footer { border-radius: 24px; box-shadow: -5px -5px 5px #988; margin: 10px; text-align: left; padding: 10px; background-color: #F2F2F2;
                clear:both;  display: block;  font-family: 'Open Sans‘ }
         </style>
</head>
<body>
```

2-page.html

Complete Web Page

```
<h1>Lenore CV</h1>

<div id="caja1">
        <img src="images/lenore2.png" width=220 height=220>
</div>

<div id="caja2">
         <p>My name is <strong> Lenore</strong> and my father is <a href="http://es.wikipedia.org/wiki/Roman_Dirge" target=_blank>Roman Dirge</a>.
        <p>Algunos piensan que soy un personaje ficticio pero les puedo asegurar que estoy más <em>viva</em> que nunca!. </p><p>Mi abuelo se llamó <a
        href="http://es.wikipedia.org/wiki/Edgar_Allan_Poe" target=_blank>Edgar Allan Poe</a> (al que no conocí), ya me escribió un <a
        href="http://en.wikisource.org/wiki/The_Works_of_the_Late_Edgar_Allan_Poe/Volume_2/Lenore" target=_blank>poema</a> tan lindo!. </p><p>Mi vida se ha hecho famosa  a través de los
        comics de mi papá y también he salido en la gran pantalla con los episodios animados hechos en flash por <em>ScreenBlast</em>. </p> <p>Probablemente todos me conozcan ya que en el 2009
        he publicado la segunda parte de mis memorias que mi papá llamó "Lenore Volume II".</p>
</div>

<div class="fin">&nbsp;&nbsp;<br></div>

<h1>My videos  </h1>
<h5><span style="font-family: 'Open Sans'">(Three boxes as iframe (in float boxes) because some WebServer does not support video formats)</span></h5>
<div class="caja">
          <div class="izq"><iframe src="https://www.youtube.com/embed/hlZXa-u-NTU" ></iframe></div>
         <div class="izq"><iframe src="https://www.youtube.com/embed/5UFCcIZh1C0" ></iframe></div>
         <div class="izq"><iframe src="https://www.youtube.com/embed/NDhj0LWFj40" ></iframe></div>
 </div>

 <div id="separado">  <h1>My Gallery</h1>  </div>
 <div id="caja3"><img src="images/lenore14.png" width="220" height="220"></div>
 <div id="caja3"><img src="images/lenore6.png" width="220" height="220"></div>
 <div id="caja3"><img src="images/lenore13.png" width="220" height="220"></div>
 <div id="separado">  <h1>My favorite sites</h1> </div>
 <div id="caja3">
        <a href="https://www.google.es/search?q=lenore+comic&source=lnms&tbm=isch&sa=X&ei=iB7rVOWIBMmvUZbBgrAM&ved=0CAgQ_AUoAQ&biw=1090&bih=562"
        target=blank_><img src="http://2.bp.blogspot.com/_G0QB7asW6_s/SLCicSoK18I/AAAAAAAAAXo/MO3lQe7HE2Y/s1600/2767825196_691515c204_o.jpg" width="220"
        height="220"></a>
</div>
<div id="caja3">
        <a href="http://lenorefans.blogspot.com.es/2008/10/comics-de-lenore-serie-completa.html" target=blank_><img src="images/lenore16.png" width="220" height="220"></a>
</div>
<div id="footer"> <p>&copy; Pirulo</p></div>
</body>
</html>
```

3-page.html

Next: JavaScript

An “scripting” language (not related to java) that is embedded in HTML documents (browser side). It is defined as object oriented, based on prototypes, imperative, weakly typed and dynamic.

The browser’s display engine must distinguish from HTML and Script statements

Others like this: java (applets/browser side but need plugin), PHP or Python or Perl (server side)

JavaScript (created by Netscape) some browsers renderings are slightly different

Standardized by European Computer Manufacturers Association (ECMA).

http://www.ecma-international. org/publications /standards/Ecma-262.htm

Where

```
<!doctype ...>
<html>
<head>
        <title> Name of web page </title>
        <script type="text/javascript">
        ...script goes here
        </script>
</head
<body>
        ...page body here: text, forms, tables
        ...more JavaScript if needed
        ...onload, onclick, etc. commands here
</body>
</html>
```

JavaScript: Characteristics

Case sensitive
Object oriented
Produces an HTML document
Dynamically typed
Standard operator precedence
Overloaded operators
Reserved words

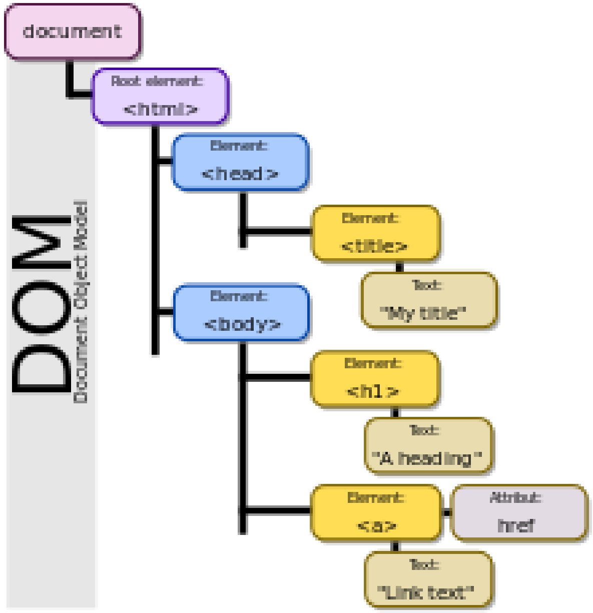
Division with / is not integer division
Modulus (%) is not an integer operator

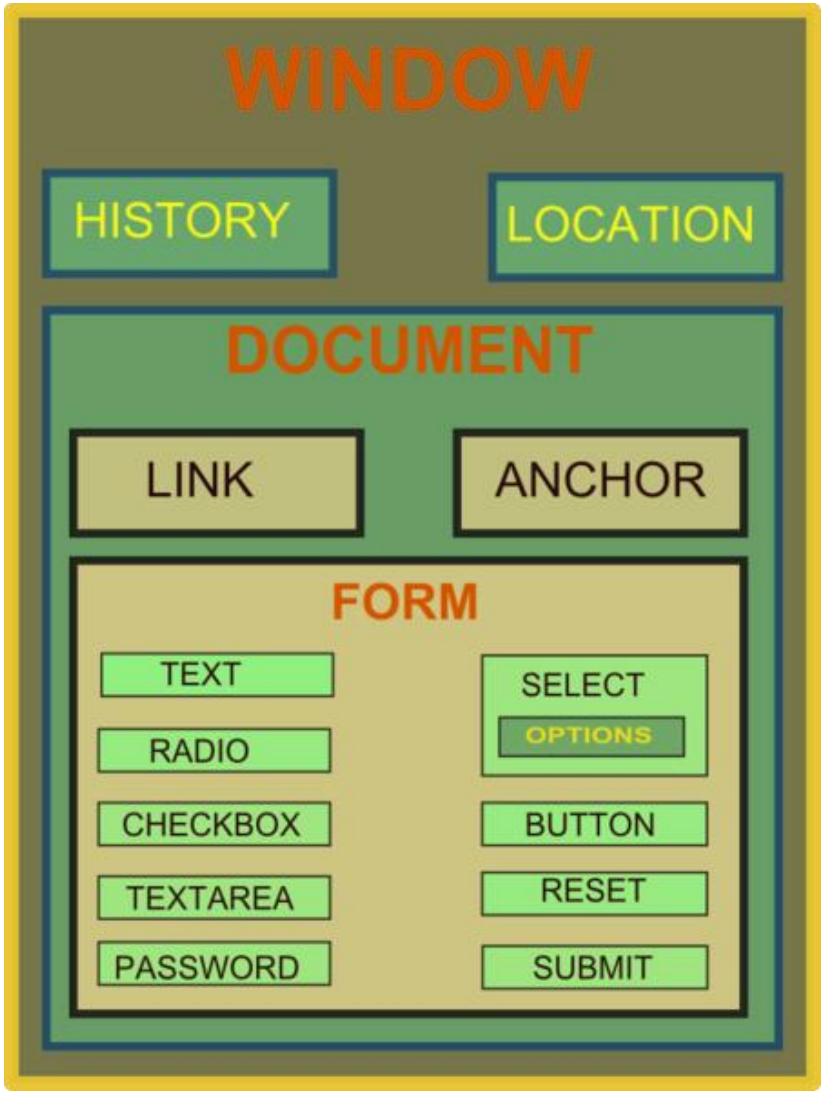
    5 / 2 yields 2.5
    5.1 / 2.1 yields 2.4285714285714284
    5 % 2 yields 1
    5.1 % 2.1 yields 0.8999999999999995

" and ' can be used in pairs
Scope rules for variables
Strings are very common data types
Rich set of methods available
Arrays have dynamic length
Array elements have dynamic type
Arrays are passed by reference
Array elements are passed by value

JavaScript: DOM model

The Document Object Model (DOM) is a cross-platform and language-independent application programming interface that treats an HTML, XHTML, or XML document as a tree structure wherein each node is an object representing a part of the document. The objects can be manipulated programmatically and any visible changes occurring as a result may then be reflected in the display of the document





JavaScript: TTK (Topics To Know)

code placement
document.writeln
document tags
window.alert
user input/output
parseInt and parseFloat
arithmetic
arithmetic comparisons
for loops

while loops
do-while loops
if-else
variable values in tags
math library
switch
break
labeled break
continue
Booleans

functions
random numbers
rolling dice
form input
form output
submit buttons
games

arrays
searching
strings
substrings
string conversions
markup methods

http://www.w3schools.com/js/ https://www.javascript.com/

JavaScript: Where?

Create functions (non-OO style)

Defined in header

Or load a .js file in header:

```
<script type="text/javascript“ language="javascript" src="mylib.js">
```

Functions called in <BODY>

Often in response to events, e.g.

```
<input type="button"… onclick="myFunc(…);">
```

Global variables

Programming by examples

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<!– Welcome to JavaScript -->
<HEAD>
<TITLE> Welcome to JavaScript </TITLE>
<SCRIPT TYPE="text/javascript">
        document.writeln( "<FONT COLOR='magenta'><H1>Welcome to ",
         "JavaScript Programming!</H1></FONT>" );

        document.write (   "<H1>Welcome(2) to ");
        document.writeln(   "JavaScript Programming!</H1>" );

        function alertWorld(){
                window.alert( "Welcome to\nJavaScript\nProgramming!" );  }
        setTimeout(alertWorld,2000)
</SCRIPT>
</HEAD>
<BODY>
</BODY>
</HTML>
```

1js/2js/3js.html

JavaScript: Craps

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<!– Welcome to JavaScript -->
<HEAD>
<meta content="text/html; charset=utf-8" http-equiv="Content-Type">
<TITLE> Welcome to JavaScript </TITLE>
<link href='http://fonts.googleapis.com/css?family=Open+Sans' rel='stylesheet' type='text/css'>
<style type="text/css">
        #caja3 {height: 180px;width: 260px;margin: 10px;float: left;text-align: left;padding: 10px;background-color: #F2FFFF;border: 1px solid
        #000;border-radius: 24px;box-shadow: -5px -5px 5px #888;font-family: 'Open Sans'}
        #separado {margin: 5px;text-align: left;padding: 5px;clear:both;display: block;font-family: 'Open Sans'}
</style>

<SCRIPT TYPE = "text/javascript">
// variables used to test the state of the game
        var WON = 0, LOST = 1, CONTINUE_ROLLING = 2;

// other variables used in program
        var firstRoll = true,    // true if first roll
        sumOfDice = 0,        // sum of the dice
        myPoint = 0,          // point if no win/loss on first roll
        gameStatus = CONTINUE_ROLLING;  // game not over yet
```

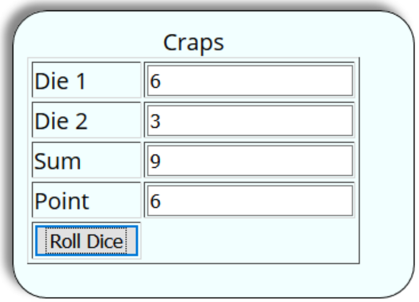
4js.html

JavaScript: Craps

```
function play() {
        if ( firstRoll ) {   // first roll of the dice
           sumOfDice = rollDice();
           switch ( sumOfDice ) {
             case 7: case 11:        // win on first roll
               gameStatus = WON;
               document.craps.point.value = ""; // clear point field
               break;
             case 2: case 3: case 12:// lose on first roll
               gameStatus = LOST;
               document.craps.point.value = ""; // clear point field
               break;
            default:  // remember point
               gameStatus = CONTINUE_ROLLING;
               myPoint = sumOfDice;
               document.craps.point.value = myPoint;
               firstRoll = false;
                }
        } else {
           sumOfDice = rollDice();
           if ( sumOfDice == myPoint ) gameStatus = WON;
           else if ( sumOfDice == 7 )  gameStatus = LOST;
        }
        if ( gameStatus == CONTINUE_ROLLING ) window.alert ("Roll again");
        else {
                if ( gameStatus == WON ) {
                        window.alert ("Player wins. " + "Click Roll Dice to play again.");
                        document.craps.point.value = " "; }
                else {  window.alert ("Player loses. " + "Click Roll Dice to play again.");
                        document.craps.point.value = " ";}
        firstRoll = true;
        }
}
```

JavaScript: Craps

```
// roll the dice
function rollDice() {
        var die1, die2, workSum;
        die1 = Math.floor( 1 + Math.random() * 6 );
        die2 = Math.floor( 1 + Math.random() * 6 );
        workSum = die1 + die2;
        document.craps.firstDie.value = die1;
        document.craps.secondDie.value = die2;
        document.craps.sum.value = workSum;
        return workSum;
}
</SCRIPT>
</HEAD>

<BODY>
        <form name = "craps" action = "">
                <div id="caja3">
                        <table border = "1">
                                <caption>Craps</caption>
                                <tr>    <td>Die 1</td>          <td><input name = "firstDie" type = "text" /></td>      </tr>
                                 <tr>   <td>Die 2</td>          <td><input name = "secondDie" type = "text" /> </td>    </tr>
                                <tr>    <td>Sum</td>            <td><input name = "sum" type = "text" /></td>           </tr>
                                <tr>    <td>Point</td>          <td><input name = "point" type = "text" /></td>         </tr>
                                <tr>    <td><input type = "button" value = "Roll Dice"    onclick = "play()" /></td>    </tr>
                       </table>
                </div>
        </form>

        <div id="separado"> <p><strong>First roll: </strong><br>
                7 or 11 is a win<br> 2, 3, or 12 is a lose<br> otherwise, roll becomes your point<br> <br>
                <strong>Subsequent rolls:<br></strong>
                rolling your point is a win<br> 7 or 11 is a lose<br> otherwise continue to roll<br>
                </p>
        </div>
</BODY>
</HTML>
```



Craps

Die 1	6
Die 2	3
Sum	9
Point	6
Roll Dice	

First roll:
7 or 11 is a win
2, 3, or 12 is a lose
otherwise, roll becomes your point

Subsequent rolls:
rolling your point is a win
7 or 11 is a lose
otherwise continue to roll

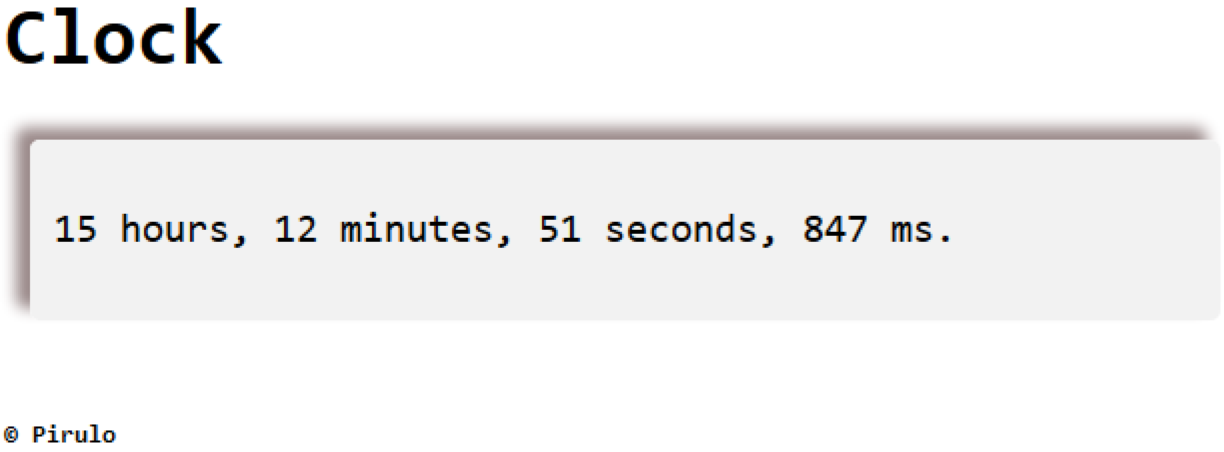
JavaScript: Events Listeners

```
<!doctype html>
<html>
<head>
<meta charset="utf-8">
<title>Clock</title>
<style type="text/css">
        h1{font-family: 'Consolas'}
        h2{font-family: 'Consolas'}
        h6{font-family: 'Consolas'}
        #footer {border-radius: 4px;box-shadow: -5px -5px 5px #988;margin: 10px;text-align: left;padding: 10px; width: 40%;background-color:
        #F2F2F2;clear:both;display: block;font-family: 'Consolas'}
</style>

<script type="text/javascript">
        var myVar = setInterval(function(){ myTimer() }, 1);
        var k = true;

        function myTimer() {
           var d = new Date();
           var t = d.getHours() + " hours, " + d.getMinutes() + " minutes, " + d.getSeconds() + " seconds, " + d.getMilliseconds() + " ms.";
           document.getElementById("reloj").innerHTML = t;
        }

        function myStopFunction() {
           clearInterval(myVar); }

        function myStartFunction() {
           myVar = setInterval(function(){ myTimer() }, 1);}

        function cambio() {
           if (k) { k = false; myStopFunction();}
           else { k = true; myStartFunction();} }

</script>
</head>
```

5js.html

JavaScript: Events Listeners

```
<body>
        <h1>Clock</h1>
        <div id="footer">
                <p id="reloj"></p>
                <script type="text/javascript">
                        var c = document.getElementById("reloj");
                        c.addEventListener('click', function(){ cambio()});
                </script>
        </div>


        <h6><br>&copy; Pirulo</h6>

</body>
</html>
```



Clock

15 hours, 12 minutes, 51 seconds, 847 ms.

© Pirulo

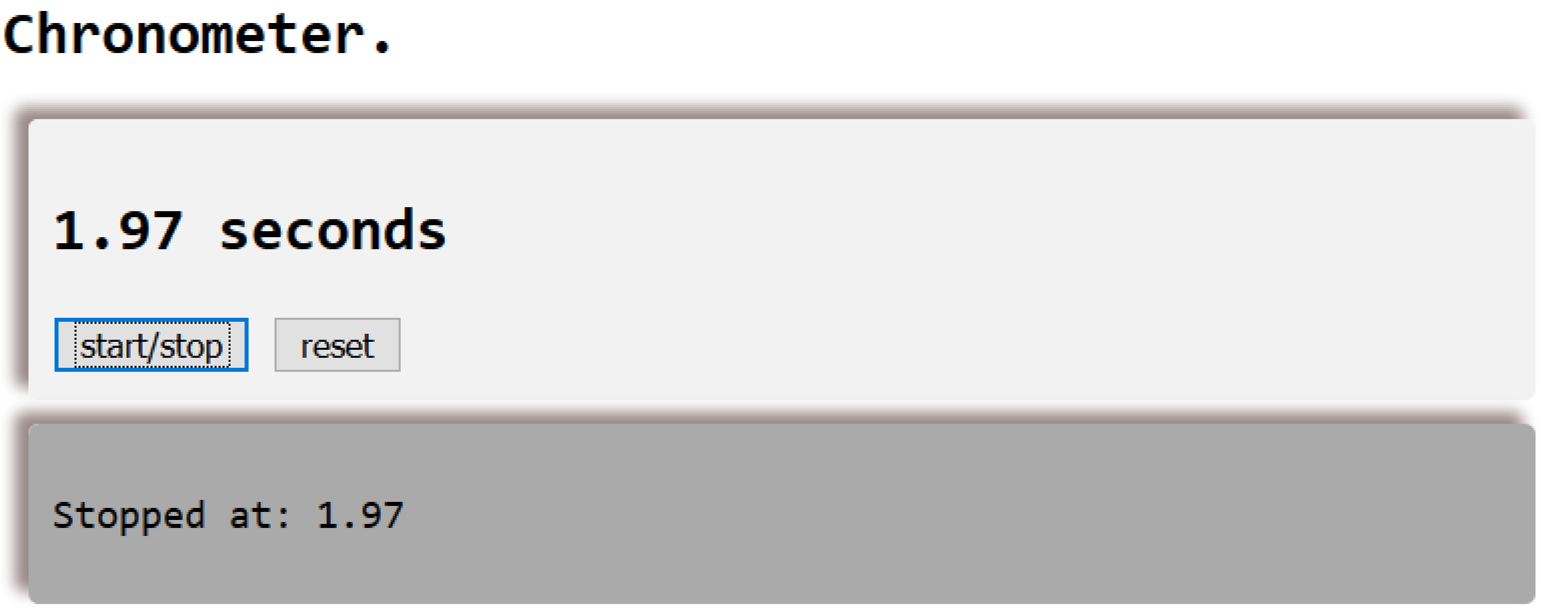
JavaScript: Touch Events

```
<!DOCTYPE html>
<html>
<head><title>Crono T&noT</title><meta charset="UTF-8">
<style type="text/css">
h1{font-family: 'Consolas'}
h2{font-family: 'Consolas'}
h6{font-family: 'Consolas'}
        #tot {  border-radius: 4px;  box-shadow: -5px -5px 5px #988;  margin: 10px;  text-align: left;  padding: 10px;  width: 40%;  background-color:
        #F2F2F2;  clear:both;  display: block;  font-family: 'Consolas'    }
        #totm {  border-radius: 4px;  box-shadow: -5px -5px 5px #988;  margin: 10px;  text-align: left;  padding: 10px;  width: 40%;
         background-color: #aaa;  clear:both;  display: block;  font-family: 'Consolas'    }
</style>
<script type="text/javascript" src="zepto.min.js" > </script>       //Zepto: subset compatible de jQuery para mobile
                                                                     //http://zeptojs.com
<script type="text/javascript" src="touch.js"></script>             //library for mobile touch
<script type="text/javascript">
$( function(){                    //function ready of $(document).ready(function() { .. Code js ... });
                                  //short form : $(function() { .. code js.. });
        var t, cl = $("#crono"), cp = $("#paradas"), str = "", on = false;
        if ("ontouchstart" in document.documentElement){
            $("#but").hide();
        }else{  // No touch. Botones.
            $("#but").show();}
  function mostrar()  { cl.html((+cl.html() + 0.01).toFixed(2)); };
  function arrancar() { t=setInterval(mostrar, 10); on = true;};
  function parar()    {
        clearInterval(t);  t=undefined; on = false;
        str = cp.html()+"<br>";
        cp.html("Stopped at: "+cl.html());};
  function cambiar()  {if (!t) arrancar(); else parar(); };
  $("#cambiar").on('click', cambiar);
  $("#inicializar").on('click', function(){ if (!on) {cl.html("0.00"); cp.html("");} });
  $("#tot").on("tap", function(){if (!t) arrancar(); else parar(); });
  $("#tot").on("swipe", function(){ if (!on) {cl.html("0.00"); cp.html("");} });
 } );
</script>
```

6js.html

JavaScript: Touch Events

```
</head>
<body>
        <h2>Chronometer.</h2>
        <div id="tot">
                <h2><span id="crono"> 0.00 </span> seconds </h2>
                <div id="but">
                        <button type="button" id="cambiar"> start/stop  </button>
                        <button type="button" id="inicializar">  reset </button>
                </div>
        </div>
        <div id="totm">
                <p id="paradas"></p>
        </div>
</body>
</html>
```



Chronometer.

1.97 seconds

Stopped at: 1.97

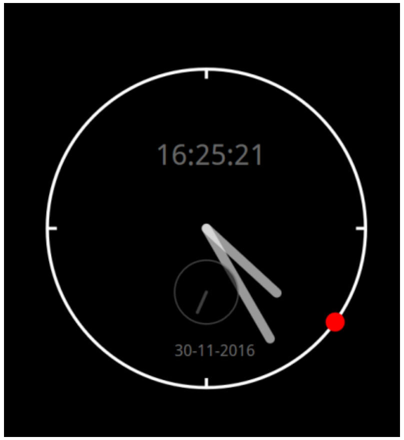
JavaScript: SVG (Scalable Vector Graphics)

Vector graphics scale without loss of quality.

```
<!DOCTYPE html><html>
<head><title>ClockRelojSVG</title><meta charset="UTF-8">
<link href='http://fonts.googleapis.com/css?family=Droid+Sans:400,700' rel='stylesheet' type='text/css'>
<style>
        html {  height: 100%;  width: 100%;}
        body {  height: 100%;  width: 100%;  margin: 0px;  padding: 0px;  color: #FFFFFF;  background-color: #000000;  font-family: 'Droid
        Sans', sans-serif;}
        h1 {  text-align: center;  color: red;  font-style: normal;  /* [disabled]font-variant: normal; */  font-size: 1.5em;  font-weight: normal;}
        #reloj {  height: 80%;  width: 80%;  left: 10%;  top: 10%;  position: absolute;}
        #tex{  text-align: center;  font-size: 3em;  margin: 20px;  padding: 20px;  text-align: center;  }
</style>
<script type="text/javascript" src="zepto.min.js" > </script>
<script>
 var i = false;
 function animar() {
  $("#cambiar").on('click', cambiar);
  var d = new Date();
  var s = d.getSeconds();   // grados = segundos * 6
  var m = d.getMinutes();   // grados = minutos * 6
  var h = d.getHours();
  var ms = d.getMilliseconds();
  var hh = h*30 + m/2;  // grados de la manecilla de horas
  var dia = d.getDate();
  var mes = d.getMonth()+1;
  var any = d.getFullYear();
  $("#tt").html(h + ":" + m + ":" + s);
  $("#tt2").html(dia + "-" + mes + "-" + any);
  $("#hor").attr("transform", "rotate(" + hh + " 80 80)");
  $("#min").attr("transform", "rotate(" + m*6 + " 80 80)");
  $("#seg").attr("transform", "rotate(" + s*6 + " 80 80)");
  if (i) {$("#msec").attr("transform", "rotate(" + ms + " 80 100)");};   }
```

7js.html

JavaScript: SVG (Scalable Vector Graphics)



16:25:21

30-11-2016

```
  function cambiar() {; if (i) {i = false;} else {i = true;};};
  function contr(){ $("#reloj").on('click', cambiar);}

  $(function(){
    setInterval(animar, 10);
    animar();
    contr();
  })
</script>
</head>
<body>
<div id="marco">
        <svg id="reloj" xmlns="http://www.w3.org/2000/svg" width="160" height="160" viewBox="0 0 160 160" >
          <circle id='myCircle'  cx='80' cy='80' r='50' stroke='white'  stroke-width='1' />
          <line x1='80' y1='30' x2='80' y2='33' style='stroke:white;stroke-width:1' />
          <line x1='80' y1='130' x2='80' y2='127' style='stroke:white;stroke-width:1' />
          <line x1='30' y1='80' x2='33' y2='80' style='stroke:white;stroke-width:1' />
          <line x1='130' y1='80' x2='127' y2='80' style='stroke:white;stroke-width:1' />

          <text id="tt"  x="64" y="60" style="fill: #696969; font-size: 9px;"></text>

          <line stroke-linecap="round" id="hor" x1='80' y1='80' x2='80' y2='50' style='stroke:white;stroke-width:3' opacity="0.6"/>
          <line stroke-linecap="round" id="min" id="min" x1='80' y1='80' x2='80' y2='40' style='stroke:white;stroke-width:3' opacity="0.6"/>

           <circle id='seg'  cx='80' cy='30' r='3' fill='red'  />
           <circle id='ms'  cx='80' cy='100' r='10' stroke='#696969'  stroke-width='0.5' opacity="0.6" />
           <line stroke-linecap="round" id="msec" x1='80' y1='100' x2='80' y2='93' style='stroke:#696969;stroke-width:1' opacity="0.6" />
           <text id="tt2"  x="70" y="120" style="fill: #696969; font-size: 5px;"></text>
        </svg>
</div>
</body></html>
```

JavaScript: Complex App = Geolocalization

The geolocation is done following hierarchy of quèries: GPS -> WIFI antenna -> GSM or 3G antenna -> Fixed IP -> The most accurate answer is returned!

The geolocation is accessible in the navigator.geolocation object

with getCurrentPosition method (successFunction, errorFunction)

Latitude and longitude in decimal format

Altitude and altitude accuracy

Direction and speed

http://dev.w3.org/geo/api/spec-source.html
http://dev.opera.com/articles/view/how-to-use-the-w3c-geolocation-api/
http://code.google.com/apis/maps/index.html

Geolocation with gmaps.js
Load a map centered on our position which is indicated by a marker

We use gmaps.js library to access Google Maps
Very powerful and easy to use library
http://hpneo.github.io/gmaps/

It is recommended to consult documentation and examples
Google's library is much more complex
A click / tap event handler is added to the map which calculates the route to the indicated point

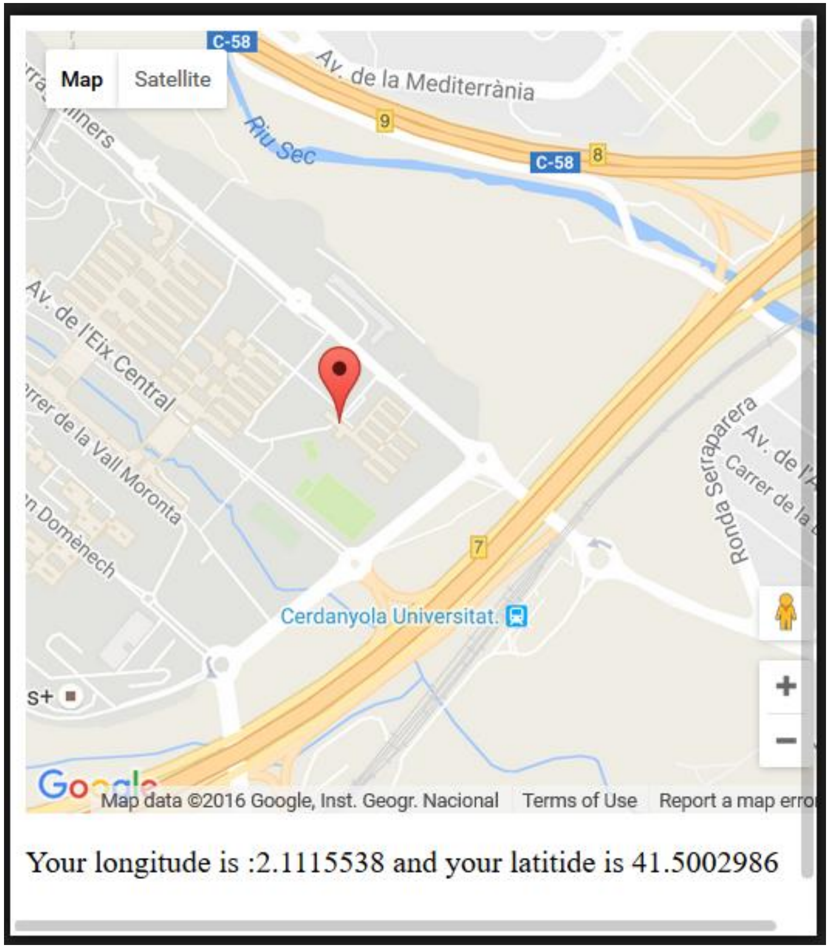
JavaScript: Complex App = Geolocalization

```
<!DOCTYPE html>
<html>
<head>
<title>Extremely basic example of the W3C Geolocation API</title>
<meta http-equiv="content-type" content="text/html; charset=utf-8" />
<style type="text/css">
       html, body {width: 100%; height: 100%; }
      #map_canvas {height: 85%; width: 100%;}
</style>

<script src="http://maps.google.com/maps/api/js"></script>

<script type="text/javascript">
// Determine support for Geolocation
if (navigator.geolocation) {  // Locate position
    navigator.geolocation.getCurrentPosition(displayPosition, errorFunction);
} else {  alert('It seems like Geolocation is not enabled in your browser. Please use a browser which supports it.'); }

// Success callback function
function displayPosition(pos) {
    var mylat = pos.coords.latitude;
    var mylong = pos.coords.longitude;
    var thediv = document.getElementById('locationinfo');
    thediv.innerHTML = '<p>Your longitude is :' + mylong + ' and your latitide is ' + mylat + '</p>';

//Load Google Map
var latlng = new google.maps.LatLng(mylat, mylong);
var myOptions = {
      zoom: 15,
      center: latlng,
      mapTypeId: google.maps.MapTypeId.ROADMAP
    };
```

8js.html

JavaScript: Complex App = Geolocalization

```
var map = new google.maps.Map(document.getElementById("map_canvas"), myOptions);

//Add marker
var marker = new google.maps.Marker({
      position: latlng,
      map: map,
      title:"You are here"
          });
}

// Error callback function
function errorFunction(pos) {
   alert('Error!');
}
</script>
</head>

<body>
   <div id="map_canvas"></div>
   <div id="locationinfo"></div>
</body>
</html>
```



Your longitude is :2.1115538 and your latitide is 41.5002986

JavaScript: Complex App = Geolocalization II

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8">
  <title>Geolocation</title>
<style>
        body{font-family: 'Droid Sans', 'Helvetica', Arial, sans-serif; }
        #txt{display: inline;  margin: 0;  padding: 0; position: left; /* posición absoluta a navegador */top: 0;   /* ajusta a borde de
        navegador */left: 0; right: 0; height: 50px;}
        #map{ display: block; margin: 0; padding: 0; position: absolute; top: 50px; left: 0; right: 0;  bottom: 0;  background: #E6E6E6; }
</style>

  <script type="text/javascript" src="zepto.min.js"></script>
  <script type="text/javascript" src="http://maps.google.com/maps/api/js"></script>
  <script type="text/javascript" src="gmaps.js"></script>
  <script type="text/javascript">

    var map, lat, lng, n;
    localStorage.lai  = (localStorage.lai || 0);
    localStorage.loi  = (localStorage.loi || 0);
    localStorage.laf  = (localStorage.laf || 0);
    localStorage.lof = (localStorage.lof || 0);

    function inito(){
      $("#res").on('click', function(){localStorage.lai = 0; localStorage.loi = 0; localStorage.laf = 0; localStorage.lof = 0; geolocalizar();});
      $("#com").on('click', compactar);
      geolocalizar();
    };
```

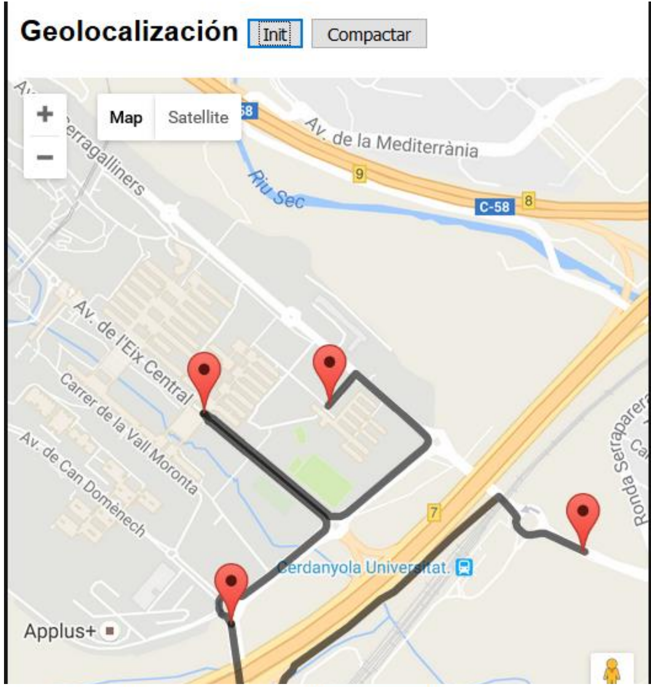
9js.html

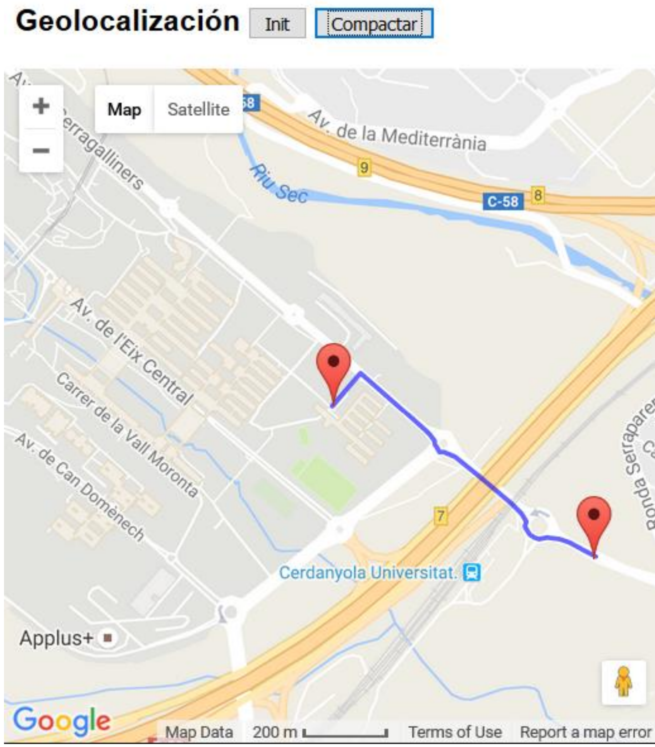
JavaScript: Complex App = Geolocalization II

```
function compactar(){
   map.removePolylines();
   map.removeMarkers();
   map.drawRoute({
       origin: [localStorage.lai, localStorage.loi],
       destination: [localStorage.laf, localStorage.lof],
       travelMode: 'driving',
       strokeColor: '#0000FF',
       strokeOpacity: 0.6,
       strokeWeight: 3
     });
   map.addMarker({ lat: localStorage.lai, lng: localStorage.loi});
   map.addMarker({ lat: localStorage.laf, lng: localStorage.lof});
 };

function enlazarMarcador(e){        // Shows path between previous and current tags
     map.drawRoute({
       origin: [lat, lng],  // Origin in previous coordinates
       destination: [e.latLng.lat(), e.latLng.lng()], //destination in click coordinates or current touch
       travelMode: 'driving',
       strokeColor: '#000000',
       strokeOpacity: 0.6,
       strokeWeight: 5
     });
     lat = e.latLng.lat();   // Store the coords for netx tags
     lng = e.latLng.lng();
     localStorage.laf = lat;
     localStorage.lof = lng;
     map.addMarker({ lat: lat, lng: lng});  // Makr in the map
   };
```

JavaScript: Complex App = Geolocalization II

```
    function geolocalizar(){
      GMaps.geolocate({
       success: function(position){
        lat = position.coords.latitude;  // Store coords lat & lng
        lng = position.coords.longitude;
        map = new GMaps({  // show map centred in [lat, lng]
                el: '#map',
                lat: lat,
                lng: lng,
                click: enlazarMarcador,
                tap: enlazarMarcador
               });
        map.addMarker({ lat: lat, lng: lng});  // add mark in [lat, lng]
        if (localStorage.lai === "0") {localStorage.lai = lat; localStorage.loi = lng;}
        else {compactar();};
       },
       error: function(error) { alert('Geolocalización falla: '+error.message); },
       not_supported: function(){ alert("Su navegador no soporta geolocalización"); },
      });
     };

   </script>

  </head>
  <body onload="inito()">
        <h3 id="txt">Geolocalization</h3>
        <div id="txt">
              <button type="button" id="res" style="font-size: 0.7em">Init</button>
              <button type="button" id="com" style="font-size: 0.7em">Compact</button>
        </div>
        <div id="map"></div>
  </body>
  </html>
```





MIT App Inventor: Features

Easy for learners to create mobile apps for **Android** smart phones

Visually fitting together puzzle piece-shaped "**programming blocks**"

Web-based

1st quarter of 2012, MIT Center for Mobile Learning launched App Inventor service for general public access

Requirements:
Macintosh (with Intel processor):
Mac OS X 10.5, 10.6 or higher
Windows: Windows 7, Windows 8
GNU/Linux: Ubuntu 8+, Debian 7+
1GB RAM (more is better)
500MB hard disk space (for offline version)

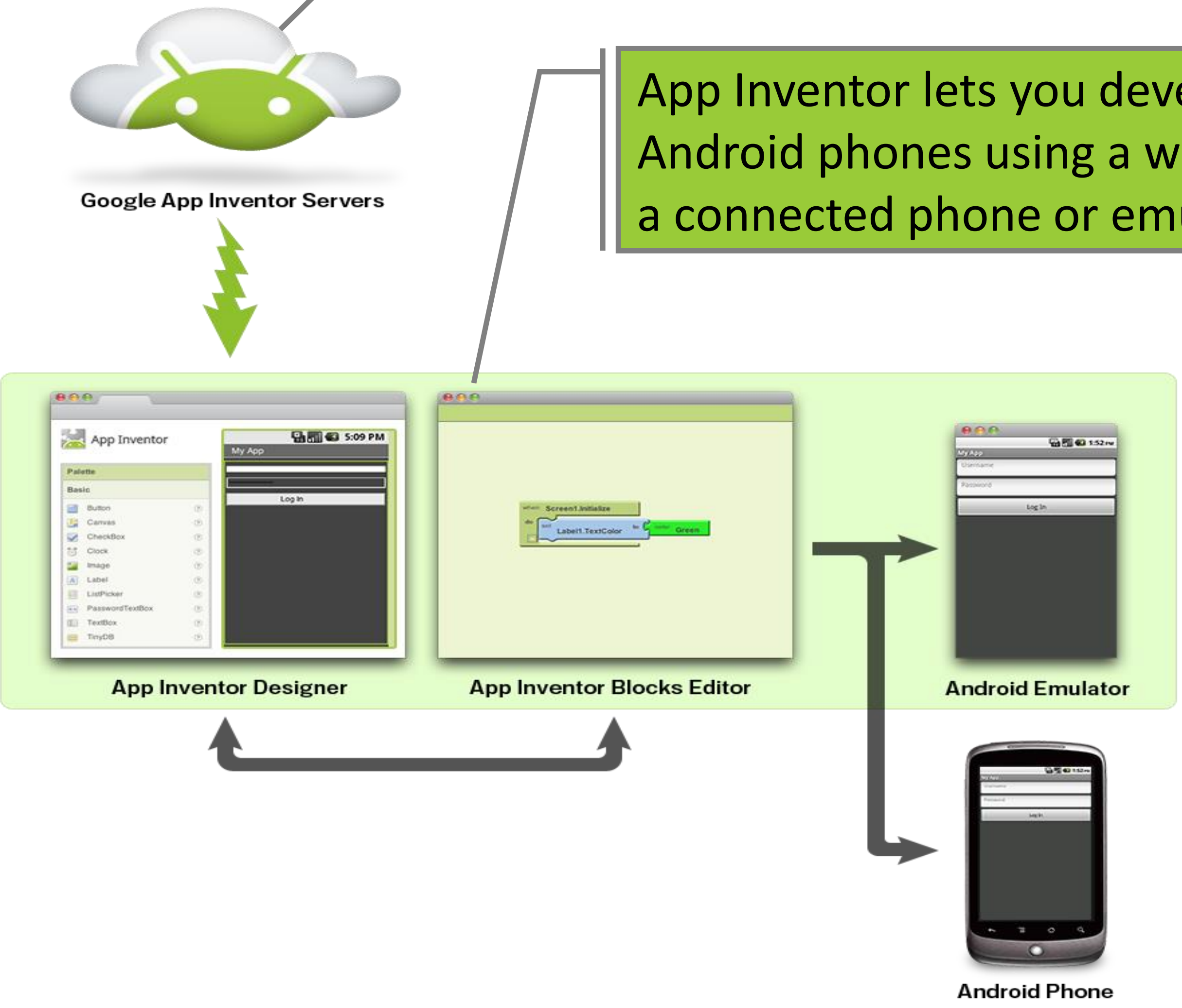
Mozilla Firefox 10 or higher
Apple Safari 5.0 or higher
Google Chrome 6.0 or higher
~~Microsoft Internet Explorer 6 or higher~~
Java 7 or higher

http://appinventor.mit.edu

MIT App Inventor: Features

The App Inventor servers store your work and help you keep track of your projects.

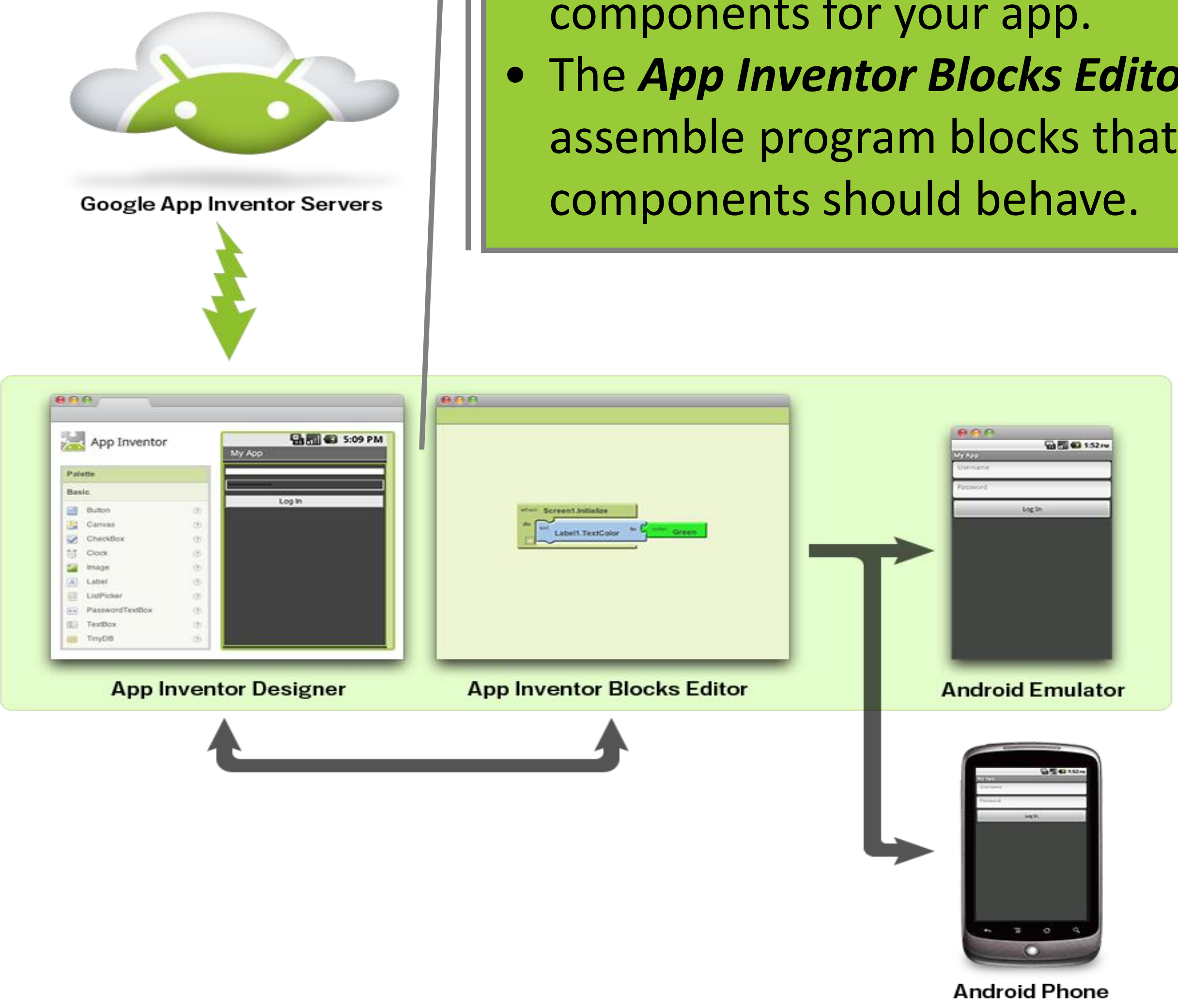
App Inventor lets you develop applications for Android phones using a web browser and either a connected phone or emulator.



MIT App Inventor: Features

You build apps by working with:

- The ***App Inventor Designer***, where you select the components for your app.
- The ***App Inventor Blocks Editor,*** where you assemble program blocks that specify how the components should behave.

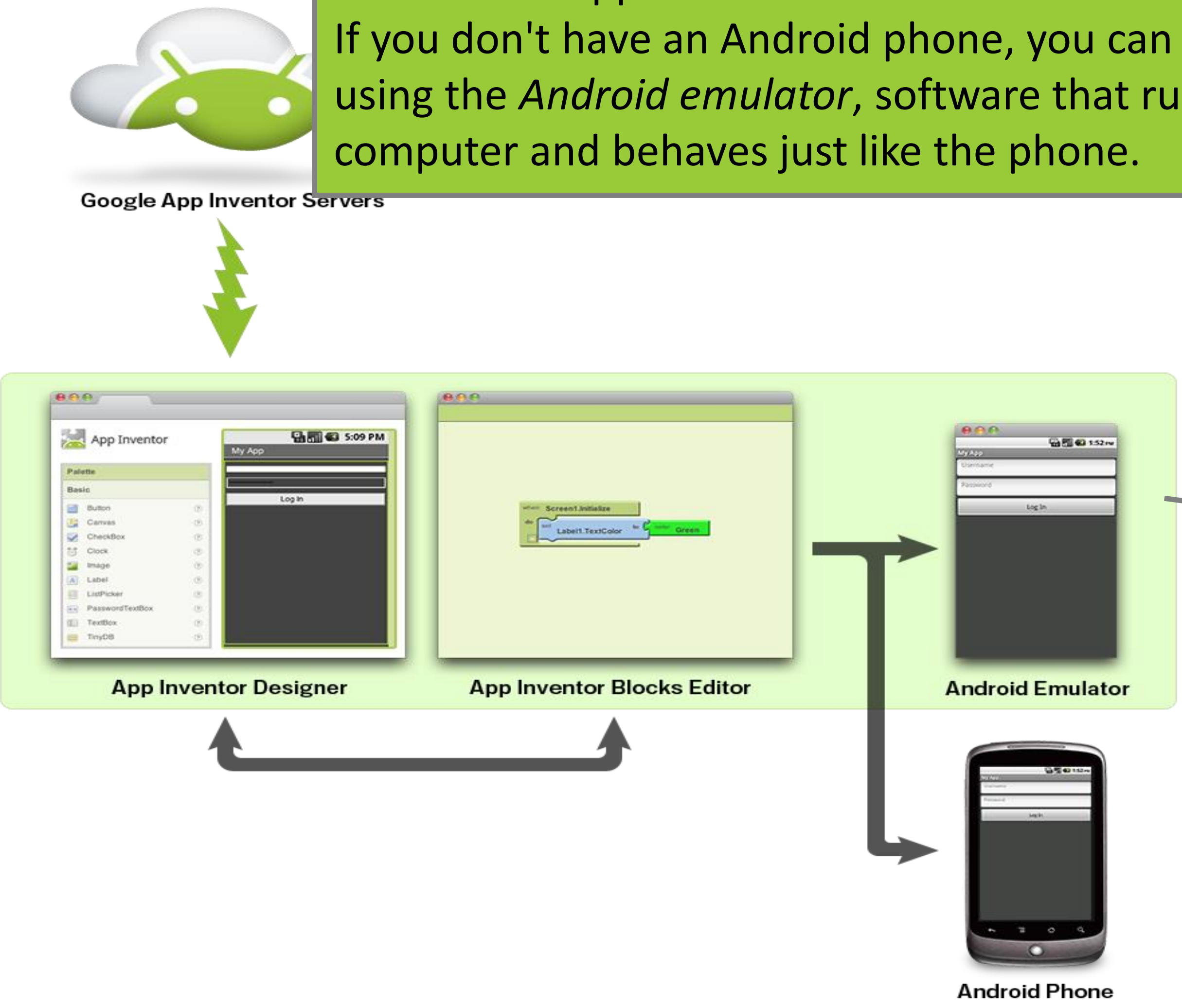


MIT App Inventor: Features

Your app appears on the phone step-by-step as you add pieces to it, so you can test your work as you build.

When you're done, you can package your app and produce a stand-alone application to install.

If you don't have an Android phone, you can build your apps using the *Android emulator*, software that runs on your computer and behaves just like the phone.

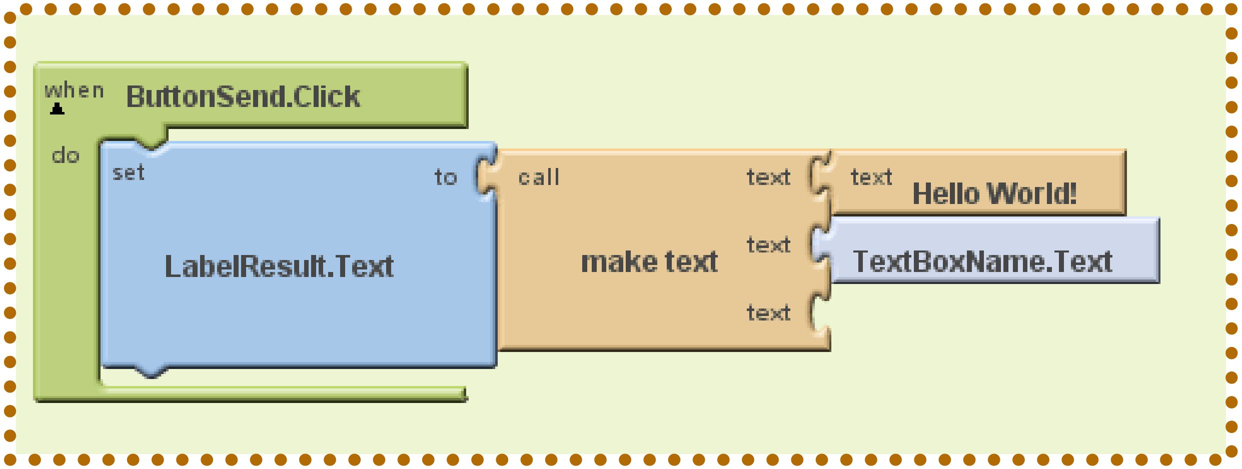


MIT App Inventor.

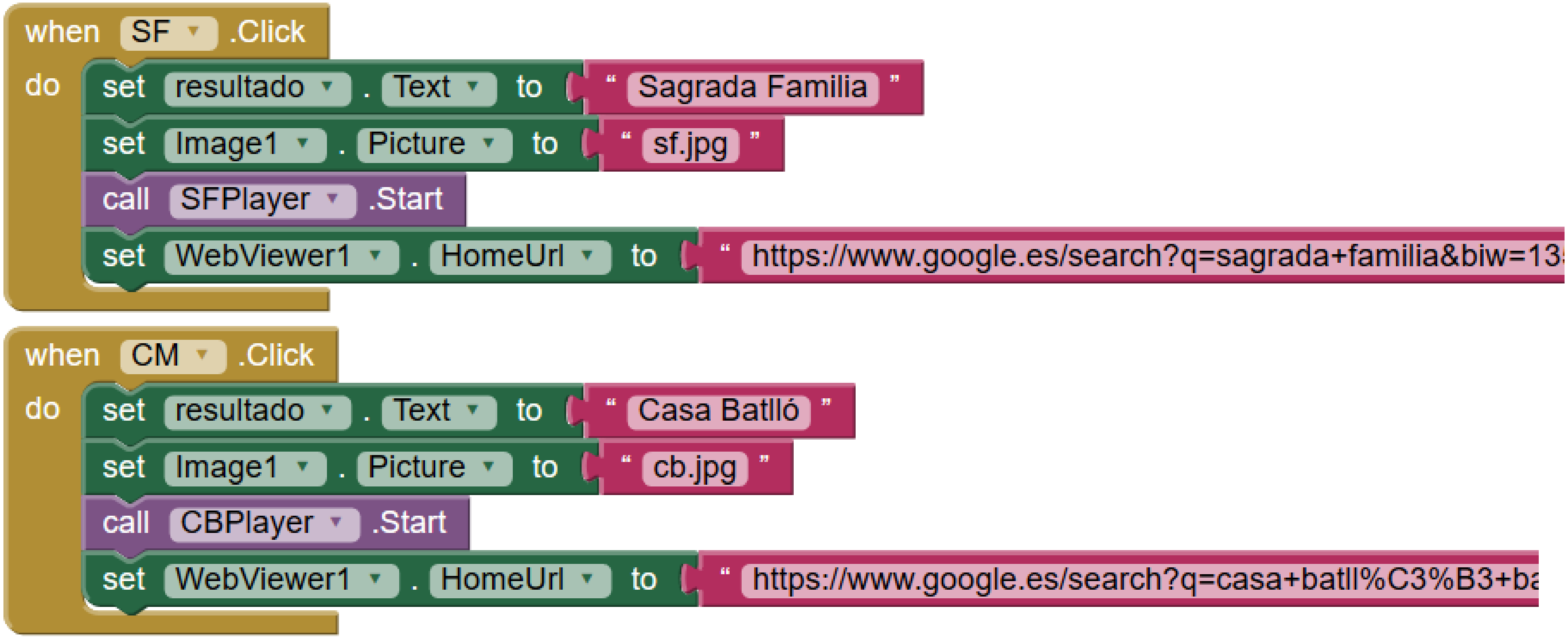
```
public class HelloWorld {
   public static void main(String[] args) {
      System.out.println("Hello, World");
   }
}
```

```
Private Sub Command1_Click()
   MsgBox "Hello, World!"
End Sub
```

Programming Blocks



MIT App Inventor.



```
when SF .Click
do  set resultado . Text to " Sagrada Familia "
    set Image1 . Picture to " sf.jpg "
    call SFPlayer .Start
    set WebViewer1 . HomeUrl to " https://www.google.es/search?q=sagrada+familia&biw=13

when CM .Click
do  set resultado . Text to " Casa Batlló "
    set Image1 . Picture to " cb.jpg "
    call CBPlayer .Start
    set WebViewer1 . HomeUrl to " https://www.google.es/search?q=casa+batll%C3%B3+ba
```

No typing of code, no syntax errors.
Events at first level
Like putting together a **puzzle** (only some pieces fit)
High-level-- the Google team has put a lot of work in it
Concrete, less abstract

Can't build everything
- User interface
- Not all phone features available

Programming is still hard work!

MIT App Inventor: Get started.

Create an account (gmail): http://ai2.appinventor.mit.edu/

Connect your Phone or Tablet over WiFi

You can use App Inventor without downloading anything to your computer! You'll develop apps on our website: ai2.appinventor.mit.edu. To do live testing on your Android device just install the MIT App Inventor Companion app on your Android phone or tablet. Once the Companion is installed, you can open projects in App Inventor on the web, open the companion on your device, and you can test your apps as you build them:

Step 1: Download and install the MIT AI2 Companion App on your phone.
Step 2: Connect both your computer and your device to the SAME WiFi Network
Step 3: Open an App Inventor project and connect it to your device

Easy and fast
No driver required
Just make sure your Android Device and Developing Computer connected to the same Local Area Network (LAN)

MIT App Inventor: Get started.

Installing and Running the Emulator in AI2

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

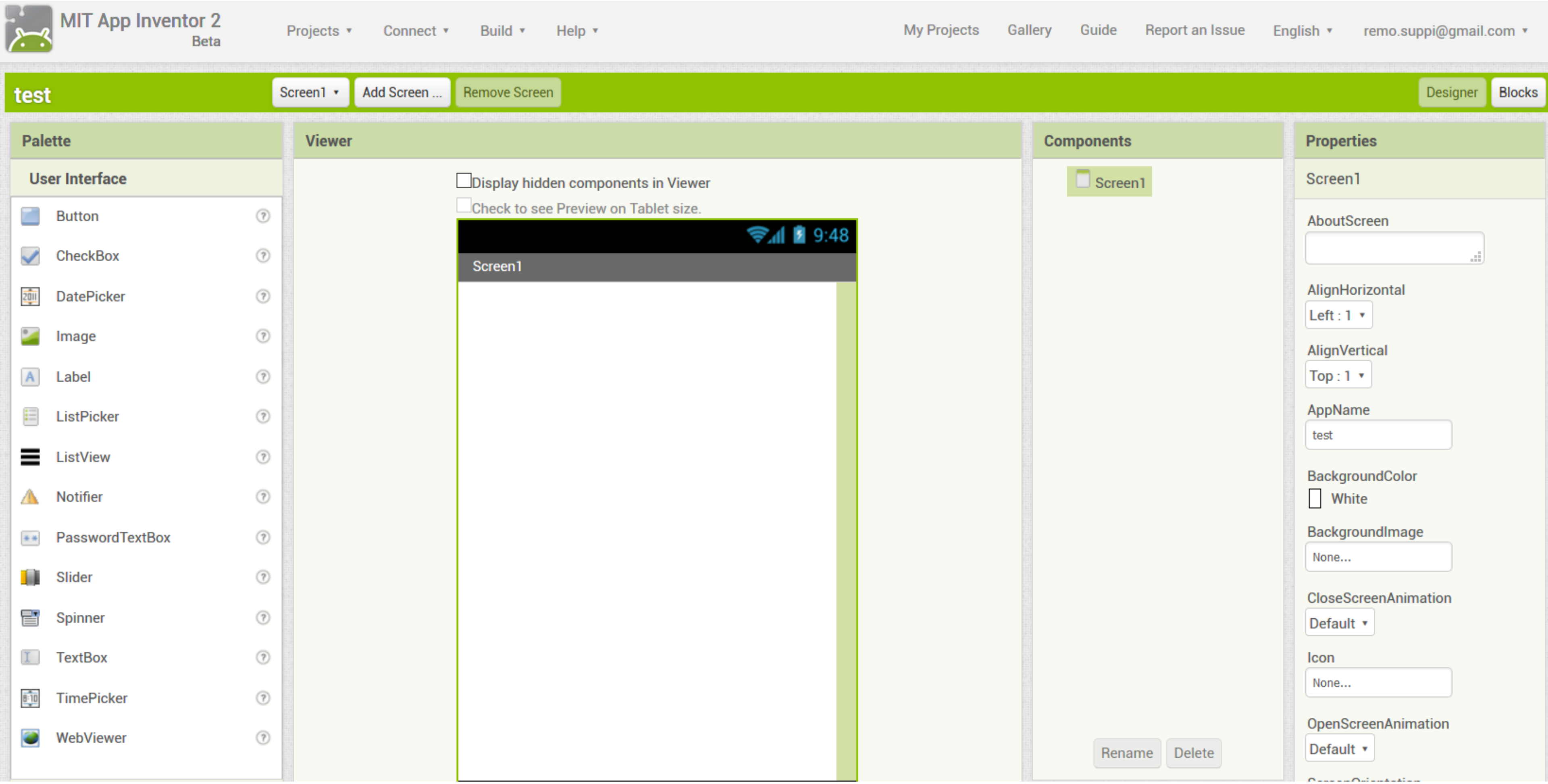
Step 1. Install the App Inventor Setup Software
Step 2. Launch aiStarter (Windows & GNU/Linux only)
Step 3. Open an App Inventor project and connect it to the emulator

Connecting to a phone or tablet with a USB cable

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

Step 1: Install the App Inventor Setup Software
Step 2: Download and install the MIT AI2 Companion App on your phone.
Step 3. Launch aiStarter (Windows & GNU/Linux only)
Step 4: Set up your device for USB (Turn USB Debugging ON)
Step 5: Connect your computer and device, and authenticate if necessary.

MIT App Inventor: How does it work?



□ Display hidden components in Viewer

□ Check to see Preview on Tablet size.

AboutScreen

AlignHorizontal: Left : 1 ▾

AlignVertical: Top : 1 ▾

AppName: test

BackgroundColor: □ White

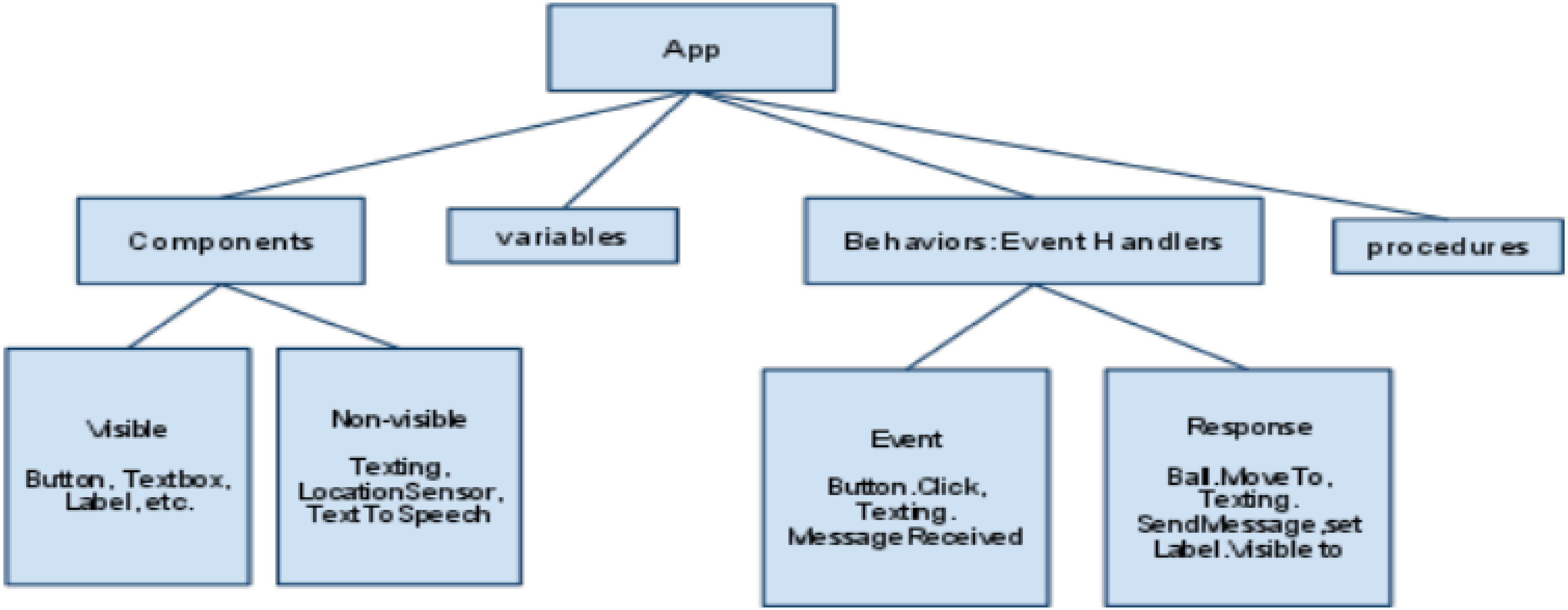
BackgroundImage: None...

CloseScreenAnimation: Default ▾

Icon: None...

OpenScreenAnimation: Default ▾

What is an App?



App

Components

variables

Behaviors: Event Handlers

procedures

Visible

Button, Textbox, Label, etc.

Non-visible

Texting, LocationSensor, TextToSpeech

Event

Button.Click, Texting. MessageReceived

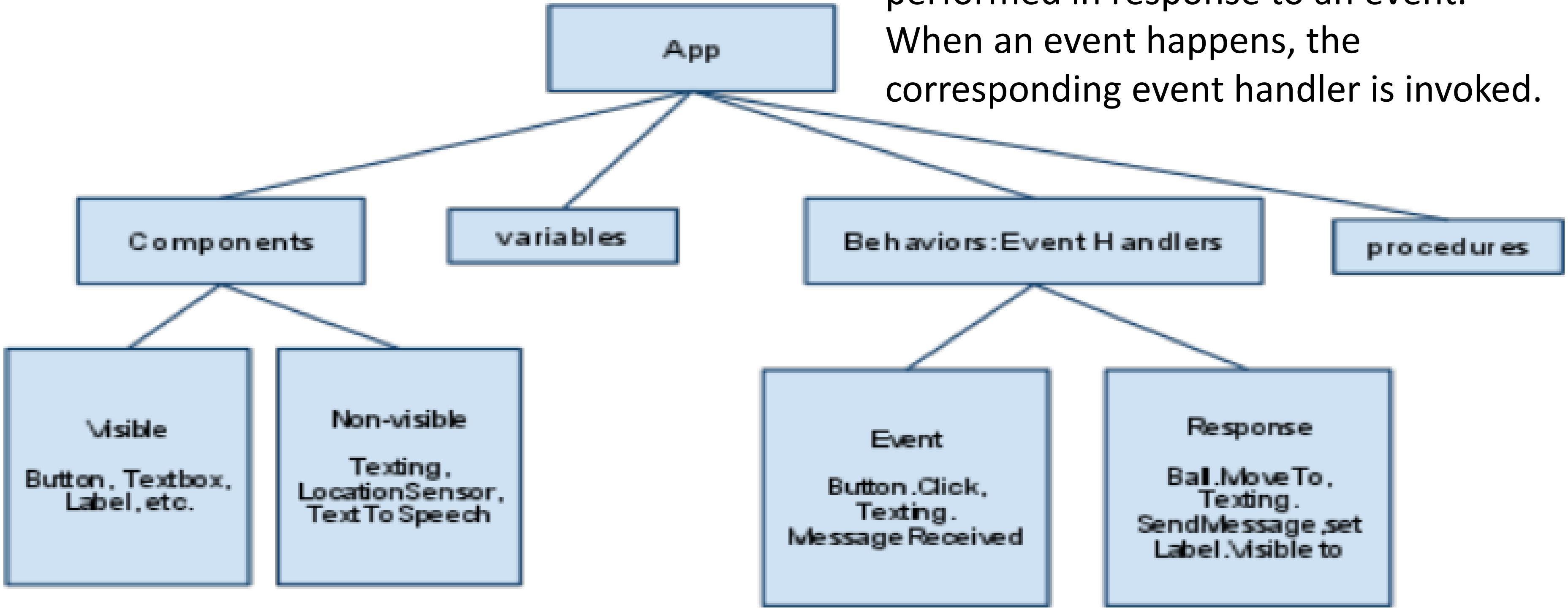
Response

Ball.MoveTo, Texting. SendMessage, set Label.Visible to

Components are objects or elements used to create an application

What is an App?

Event Handlers: The functions performed in response to an event. When an event happens, the corresponding event handler is invoked.



App

Components

variables

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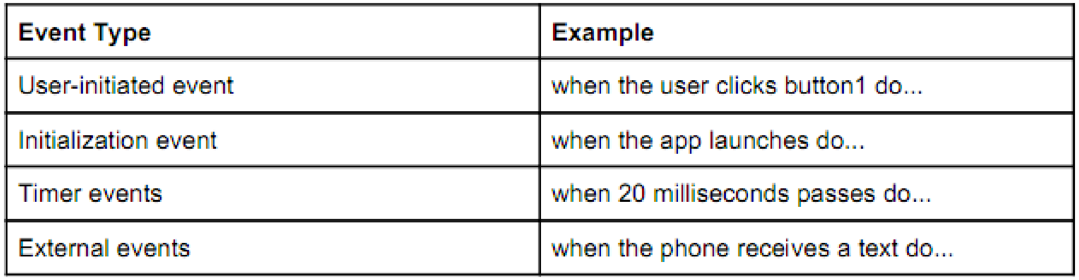
Button.Click, Texting. MessageReceived

Response

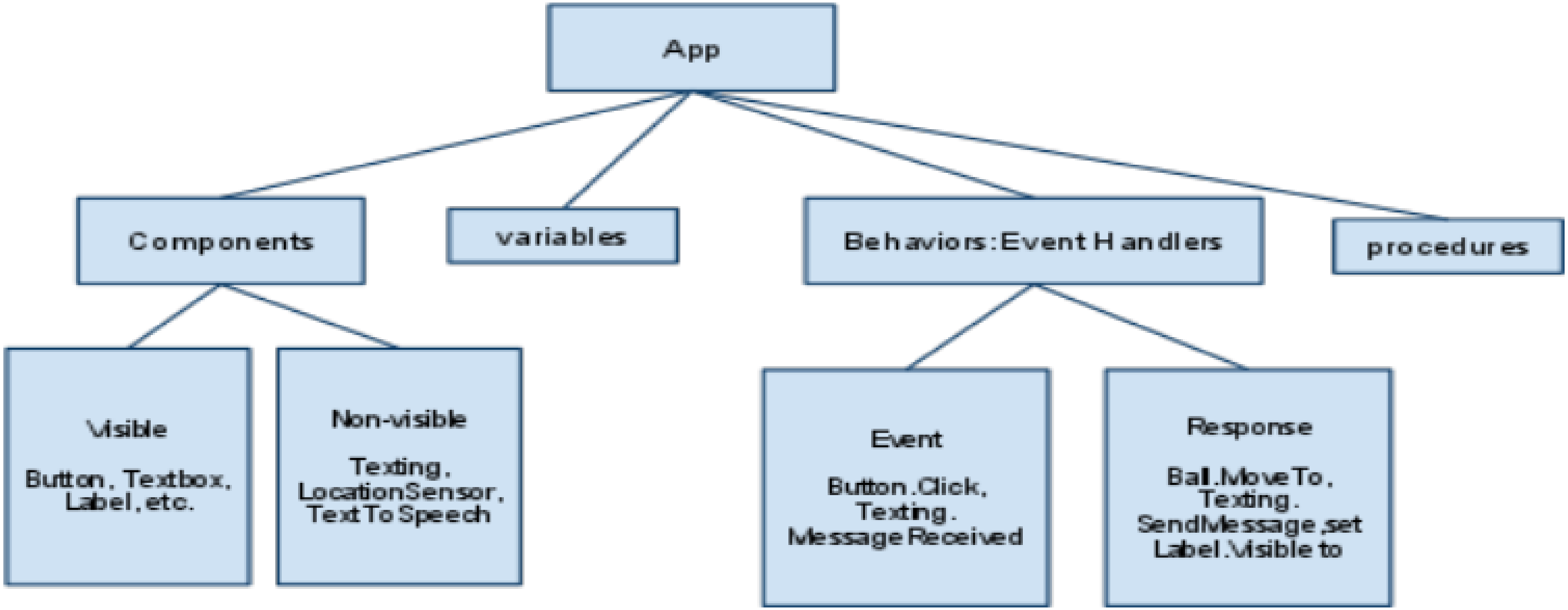
Ball.MoveTo, Texting. SendMessage,set Label.Visible to

In computer programming, event-driven programming or event-based programming is a programming paradigm in which the flow of the program is determined by events—i.e., sensor outputs or user actions (mouse clicks, key presses) or messages from other programs or threads.



Event Type	Example
User-initiated event	when the user clicks button1 do...
Initialization event	when the app launches do...
Timer events	when 20 milliseconds passes do...
External events	when the phone receives a text do...

What is an App?



App

Components

variables

Behaviors:Event Handlers

procedures

Visible

Button, Textbox, Label, etc.

Non-visible

Texting, LocationSensor, TextToSpeech

Event

Button.Click, Texting. MessageReceived

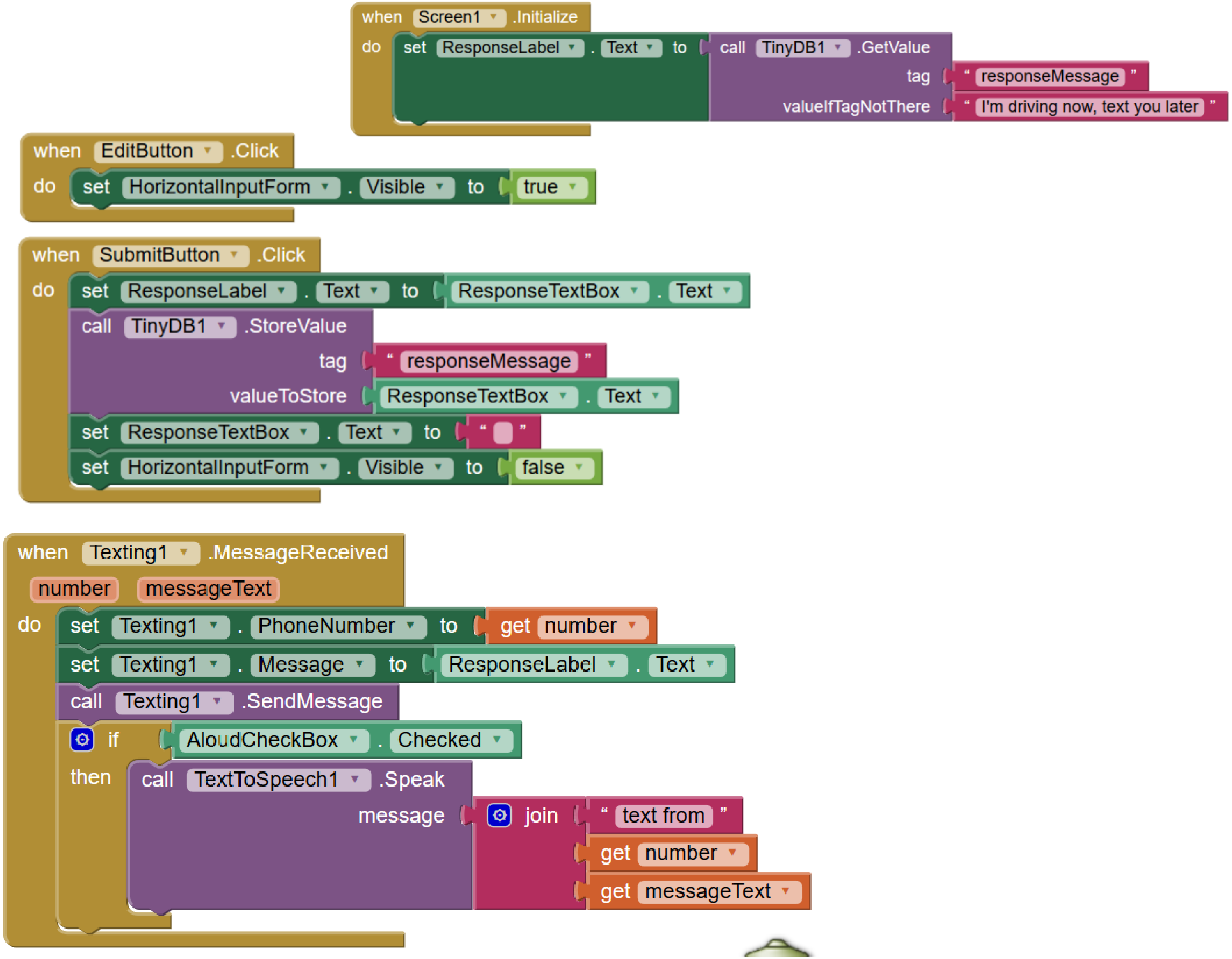
Response

Ball.MoveTo, Texting. SendMessage,set Label.Visible to

A behavior defines how the app should respond to the events, both user initiated (e.g., button click) and external (e.g., an SMS text arrives to the phone).

No Texting While Driving

http://www.appinventor.org/content/ai2apps/simpleApps/noTexting



```
when Screen1 .Initialize
do  set ResponseLabel . Text to  call TinyDB1 .GetValue
                                                  tag  " responseMessage "
                                     valueIfTagNotThere  " I'm driving now, text you later "

when EditButton .Click
do  set HorizontalInputForm . Visible to true

when SubmitButton .Click
do  set ResponseLabel . Text to ResponseTextBox . Text
    call TinyDB1 .StoreValue
                      tag  " responseMessage "
             valueToStore  ResponseTextBox . Text
    set ResponseTextBox . Text to " "
    set HorizontalInputForm . Visible to false

when Texting1 .MessageReceived
 number  messageText
do  set Texting1 . PhoneNumber to get number
    set Texting1 . Message to ResponseLabel . Text
    call Texting1 .SendMessage
    if  AloudCheckBox . Checked
    then  call TextToSpeech1 .Speak
                        message  join  " text from "
                                       get number
                                       get messageText
```

3rd Lab

1. Using geolocalization and gmaps library create a page with HTML, CCS3, Javascript where the user selects on the map two positions and get the route by driving, bicycling and walking (you can use the code example) using different colours.

(the libraries zepto-min.js, touch.js, gmaps.js must be in the same directory as the geo.html file)

2. Using App Inventor import tourism app and create an app using the environment. The app can be on the topic that you prefer.

(use *Project->import from my computer* in order to upload the app to your environment.

References:

1. Advanced Data Management. Jiaheng Lu. Department of Computer Science. Renmin University of China. www.jiahenglu.net
2. Cloud Computing for Networked Libraries and Information Centers. V. Caintic. Learning and Information Center. University of Mindanao. 2010. virginiacaintic@yahoo.com
3. The Challenges in ICT: Debunking the Hype. K. Jeffery. Science and Technology Facilities Council. Harwell Oxford. Rutherford Appleton Laboratory. UK. keith.jeffery@stfc.ac.uk
4. Big Data Analytics. Lecture Series . Kalapriya Kannan. IBM Research Labs. July, 2013
5. Infrastructure and Implementation Topics. T. Sridhar. The Internet Protocol Journal, Volume 12, No.4. http://www.cisco.com/web/about/ac123/ac147/archived_issues/ipj_12-4/124_cloud2.html
6. Cloud Computing: Concepts, Technologies and Business Implications. B. Ramamurthy & K. Madurai bina@buffalo.edu & kumar.madurai@ctg.com
7. A Mainframe Guy Is Still Thinking About Cloud Computing. Glenn Anderson, © IBM Training. 2011.
8. Business in the cloud. M. Hugos, D. Hulitzky. Wiley. ISBN 978 0 470 61623 9
9. Distributed Computing. Chapter 13. Sunita Mahajan, Seema Shah. Oxford press.
10. Cloud Application Architectures. G. Reese. O’Reilly. ISBN: 978-0-596-15636-7
11. Cloud Computing Bible. B. Sosinsky. Wiley. ISBN: 978-0-470-90356-8
12. Cloud Security and Privacy. T. Mather, S. Kumaraswamy, and S. Latif. O’Reilly. ISBN: 978-0-596-80276-9
13. Cloud Computing. Theory and Practice. D. Marinescu. Elselvier. ISBN: 978-0-12404-627-6
14. Above the Clouds: A Berkeley View of Cloud Computing. M. Armbrust et al. University of California at Berkeley. http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf
15. An Introduction to Cloud Computing with OpenNebula. Daniel Molina Aranda. dmolina@opennebula.org. http://www.slideshare.net/opennebula/tecni-28445050
16. OpenNebula 4.2: 3-hour Hands-on Tutorial. http://opennebula.org/documentation/tutorials/.