

INTRODUCCIÓN A MIT APP INVENTOR

CONTROLANDO ARDUINO DESDE DISPOSITIVOS
MÓVILES

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CEP Sevilla 2019



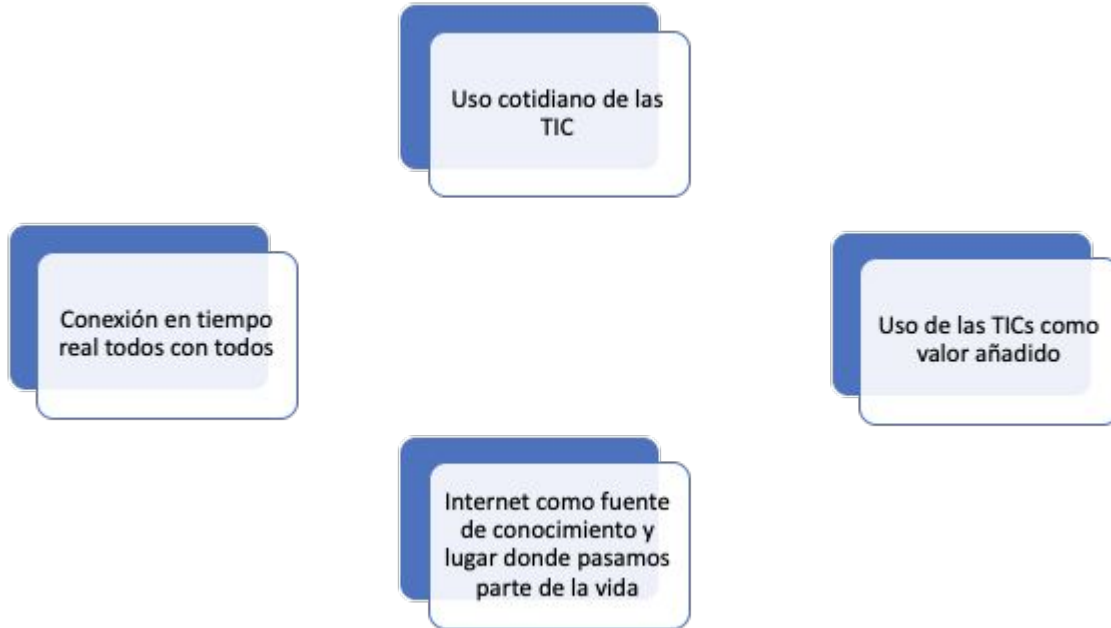
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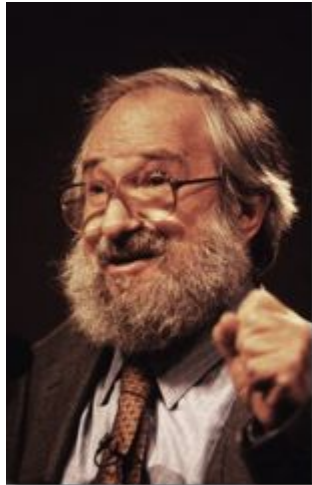


Tecnología y educación



Pensamiento computacional

- Construccinismo (Papert & Harel, 1991)
- Pensamiento Computacional (Wing, 2006)



Seymour Papert



Jeannette M. Wing

Más allá: Acción computacional

Viewpoint Jeannette M. Wing

Computational Thinking

It represents a universally applicable attitude and skill set everyone, not just computer scientists, would be eager to learn and use.



Computational thinking builds on the power and limits of computing processes, whether they are executed by a human or by a machine. Computational methods and models give us the courage to solve problems and design systems that no one of us would be capable of tackling alone. Computational thinking confronts the riddle of machine intelligence: What can humans do better than computers? and What can computers do better than humans? Most fundamentally it addresses the question: What is computable? Today, we know only parts of the answers to such questions.

Computational thinking is a fundamental skill for everyone, not just for computer scientists. To reading, writing, and arithmetic, we should add computational thinking to every child's analytical ability. Just as the printing press facilitated the spread of the

cisely. Stating the difficulty of a problem accounts for the underlying power of the machine—the computing device that will run the solution. We must consider the machine's instruction set, its resource constraints, and its operating environment.

In solving a problem efficiently, we might further ask whether an approximate solution is good enough, whether we can use randomization to our advantage, and whether false positives or false negatives are allowed. Computational thinking is reformulating a seemingly difficult problem into one we know how to solve, perhaps by reduction, embedding, transformation, or simulation.

Computational thinking is thinking recursively. It is parallel processing. It is interpreting code as data and data as code. It is type checking as the generalization of dimensional analysis. It is recognizing both the virtues and the dangers of aliasing, or giving someone or something more than one name. It is recognizing both the cost and power of indirect addressing and procedure call. It is judging a pro-



viewpoints

DOI:10.1145/3265747

Mike Tissenbaum, Josh Sheldon, and Hal Abelson

Viewpoint

From Computational Thinking to Computational Action

Envisioning computing education that both teaches and empowers.

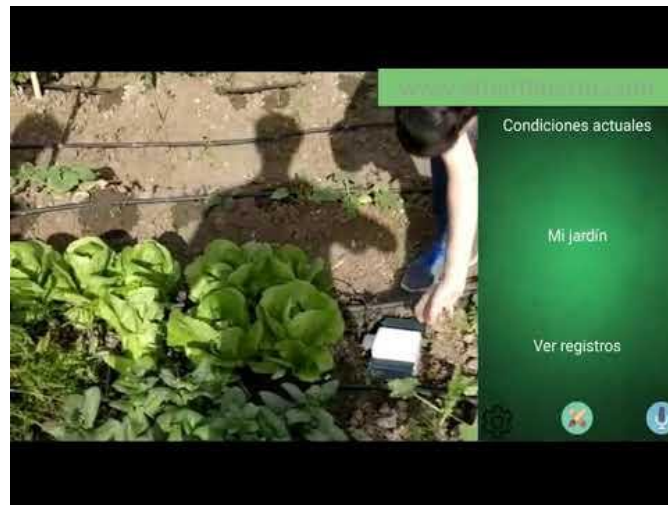
COMPUTATIONAL ACTION, A new framing for computing education, proposes that while learning about computing, young people should also have opportunities to create with computing that have direct impact on their lives and their communities. In this Viewpoint, we outline two key dimensions of computational action—computational identity and digital empowerment—and further argue that by focusing on computational action in addition to computational thinking, we can make computing education more inclusive, motivating, and empowering for young learners. Learners have the capacity to develop computational products that can have authentic impact in their lives from the moment they begin learning to code, all they need is to be situated in contexts that allow them to do so.

Too often, K-12 computing education has been driven by an emphasis on kids learning the “fundamentals” of programming. Even more progres-




...y todo esto ¿por qué?

- Aumentamos la motivación
- Aprendemos haciendo
- Conectamos el mundo virtual con el real



Introducción a MIT App Inventor



- Plataforma para el desarrollo de aplicaciones móviles del Instituto Tecnológico de Massachusetts 
- Open-source y totalmente gratuita
- Objetivo: Democratizar el desarrollo de apps

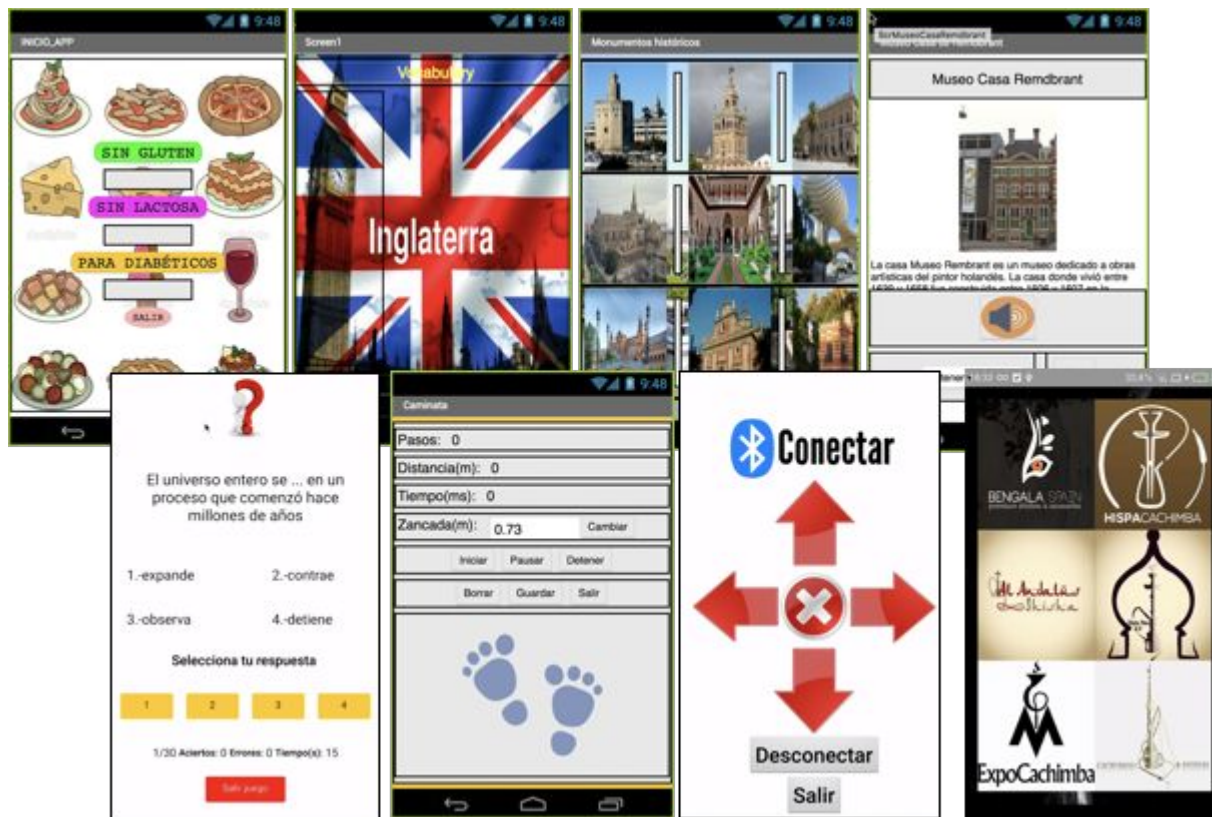


Características de MIT App Inventor

- Visual, intuitivo, sencillo y muy potente
- Basado en bloques como Scratch
- Fomenta la creatividad y el trabajo en equipo
- Proyectos alojados en la nube
- Cualquiera puede publicar su app
- ¡El producto lo tienes en tu bolsillo!



Aplicaciones de todo tipo



Requerimientos de MIT App Inventor

- Ordenador con conexión a internet*
- Cuenta de Google
- Además de lo anterior, lo ideal es que dispongamos:
 - Dispositivo Android (pronto para iOS)
 - WIFI en la misma red que el ordenador



**Build your project on
your computer**

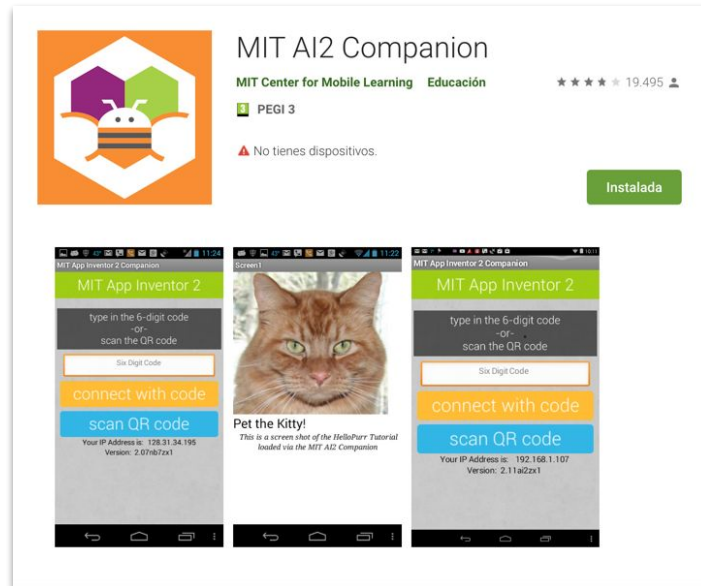


**Test it in real-time on
your device**

*: Existen versiones offline

MIT AI2 Companion

- Permite probar la app mientras desarrollamos.
- Instalarla o bien usar un [emulador](#).



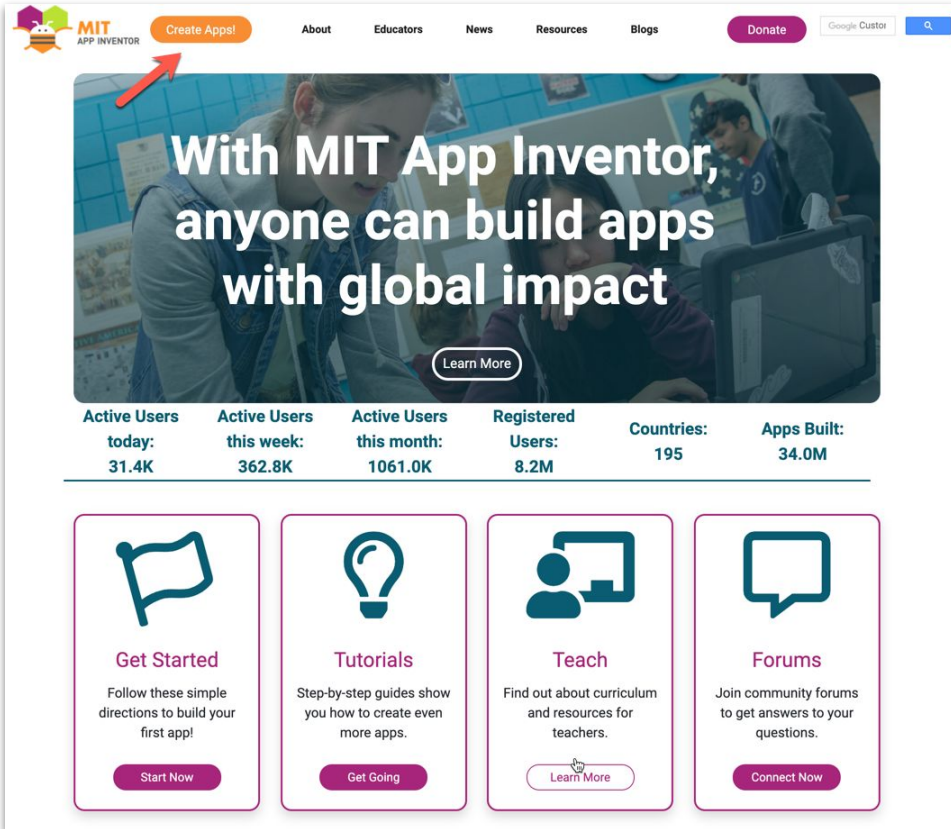
App: Hola Mundo Arduino



1. Acceso a la plataforma y gestión de proyectos
2. Entorno de trabajo
3. Pruebas con MIT AI2 Companion
4. Publicar y compartir una app en Gallery
5. Importar/Exportar proyectos



Acceso a la plataforma



The screenshot shows the MIT App Inventor homepage. At the top, there is a navigation bar with the MIT App Inventor logo on the left, followed by a 'Create Apps!' button (highlighted with a red arrow), and links for 'About', 'Educators', 'News', 'Resources', and 'Blogs'. On the right side of the navigation bar are a 'Donate' button and a 'Google Custom' search bar.

The main banner features a background image of two students working on a computer. The text on the banner reads: 'With MIT App Inventor, anyone can build apps with global impact'. Below this text is a 'Learn More' button.

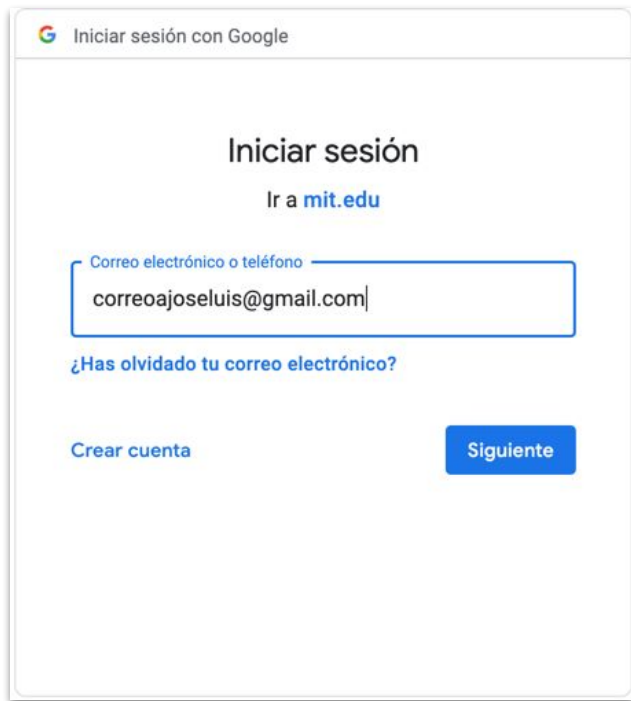
Below the banner is a statistics section with the following data:

Active Users today:	Active Users this week:	Active Users this month:	Registered Users:	Countries:	Apps Built:
31.4K	362.8K	1061.0K	8.2M	195	34.0M

Below the statistics section are four cards, each with an icon, a title, a description, and a button:

- Get Started**: Follow these simple directions to build your first app! [Start Now](#)
- Tutorials**: Step-by-step guides show you how to create even more apps. [Get Going](#)
- Teach**: Find out about curriculum and resources for teachers. [Learn More](#)
- Forums**: Join community forums to get answers to your questions. [Connect Now](#)


Acceso a la plataforma



The screenshot shows the Google login interface. At the top, it says 'Iniciar sesión con Google' next to the Google logo. Below that, the heading 'Iniciar sesión' is centered, followed by 'Ir a [mit.edu](#)'. A text input field is labeled 'Correo electrónico o teléfono' and contains the email 'correoajoseluis@gmail.com'. Below the input field is a link that says '¿Has olvidado tu correo electrónico?'. At the bottom left is a link 'Crear cuenta', and at the bottom right is a blue button labeled 'Siguiente'.

- Autenticación basada en Google.
- La primera vez tendremos que aceptar los términos del servicio(ToS).

Gestión de proyectos e idioma



Projects ▾ Connect ▾ Build ▾ Settings ▾ Help ▾

My Projects Gallery Guide Report an Issue English ▾ correoajoseluis@gmail.com ▾

Start new project Delete Project Publish to Gallery

My Projects

Name	Date Created	Date Modified ▾	Published
<input type="checkbox"/> Firebase	Apr 16, 2018, 12:31:10 PM	Oct 14, 2019, 9:05:50 PM	No
<input type="checkbox"/> HojaDeCalculo	Sep 29, 2019, 8:57:31 PM	Oct 14, 2019, 9:05:23 PM	No
<input type="checkbox"/> UbicacionJC	Sep 15, 2019, 10:30:53 AM	Sep 15, 2019, 10:33:47 AM	No
<input type="checkbox"/> Reloj	Sep 14, 2019, 8:37:36 PM	Sep 14, 2019, 8:48:33 PM	No
<input type="checkbox"/> Corredor_Verde	Sep 11, 2019, 12:16:14 PM	Sep 11, 2019, 12:21:00 PM	No
<input type="checkbox"/> corredor_seguro_1_1	Sep 11, 2019, 11:49:56 AM	Sep 11, 2019, 11:49:56 AM	No
<input type="checkbox"/> consulta_saldo	Aug 17, 2019, 12:03:56 AM	Aug 17, 2019, 12:10:09 AM	No
<input type="checkbox"/> Cuestionario	Jun 7, 2019, 8:26:56 PM	Aug 11, 2019, 11:32:56 PM	No
<input type="checkbox"/> JLIOT	Aug 3, 2019, 8:46:00 PM	Aug 3, 2019, 8:38:06 PM	No
<input type="checkbox"/> JungleMitAPP	Aug 1, 2019, 6:26:30 PM	Aug 1, 2019, 6:26:30 PM	No
<input type="checkbox"/> C06_OrientationSensor	Jul 22, 2019, 6:33:20 PM	Jul 22, 2019, 6:33:20 PM	No
<input type="checkbox"/> C06_InclinarTelefono	Jun 27, 2018, 12:50:16 AM	Jul 22, 2019, 6:33:00 PM	No
<input type="checkbox"/> C07_Frog	Jul 22, 2019, 6:19:45 PM	Jul 22, 2019, 6:19:45 PM	No
<input type="checkbox"/> C06_Frog	Jul 22, 2019, 6:12:55 PM	Jul 22, 2019, 6:12:55 PM	No
<input type="checkbox"/> C06_Rana	Jun 27, 2018, 8:45:17 AM	Jul 22, 2019, 6:12:41 PM	No
<input type="checkbox"/> C05_SpeechRecognizer	Jul 22, 2019, 9:13:49 AM	Jul 22, 2019, 9:18:54 AM	No
<input type="checkbox"/> C05_ReconocimientoDeVoz	Jun 27, 2018, 12:23:47 AM	Jul 22, 2019, 9:13:24 AM	No
<input type="checkbox"/> C04_Mole_Start_Stop	Jul 22, 2019, 8:44:53 AM	Jul 22, 2019, 8:48:16 AM	No
<input type="checkbox"/> C04_Mole_Iniciar_Detener	Jun 27, 2018, 12:14:42 AM	Jul 22, 2019, 8:44:30 AM	No
<input type="checkbox"/> C03_MoleMash	Jul 21, 2019, 9:53:57 PM	Jul 21, 2019, 9:53:57 PM	No
<input type="checkbox"/> C03_Mole	Jun 27, 2018, 12:03:25 AM	Jul 21, 2019, 9:53:35 PM	No
<input type="checkbox"/> C02_Pet_The_Kitty	Jul 21, 2019, 8:56:05 PM	Jul 21, 2019, 9:00:54 PM	No
<input type="checkbox"/> C02_Acaricia_el_gatito	Jun 26, 2018, 11:31:03 PM	Jul 21, 2019, 8:53:44 PM	No
<input type="checkbox"/> C01_BounceBall	Jul 21, 2019, 7:33:31 PM	Jul 21, 2019, 8:14:27 PM	No
<input type="checkbox"/> C01_RebotePelota	Jun 26, 2018, 10:27:48 PM	Jul 21, 2019, 7:32:54 PM	No

Deutsch

English

Español

Français

Magyar

Italiano

한국어

Nederlands

Polski

Português

Português do Brasil

Русский

Svenska

简体中文

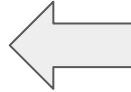
繁体中文

Crear un proyecto: HolaMundoArduino



Crear un nuevo proyecto de App Inventor

Nombre del proyecto:

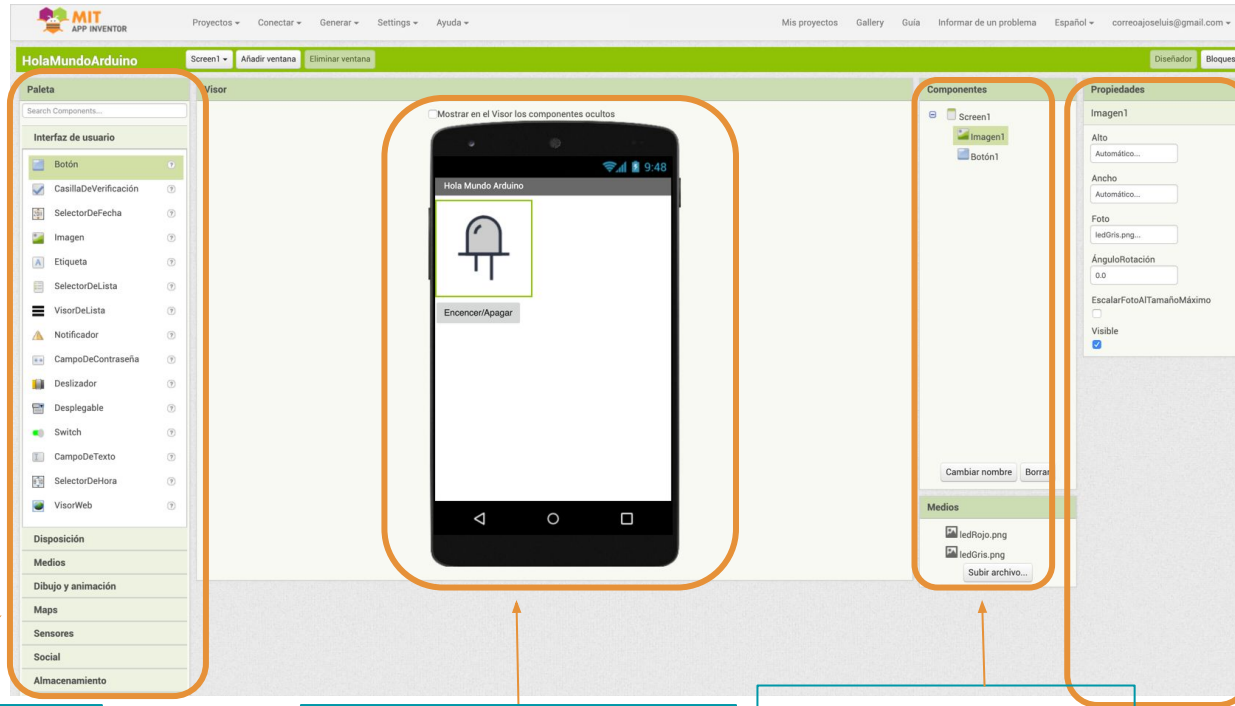


- Sin tildes, sin espacios, sin símbolos especiales y sin ñes
- En la instalación, el nombre de la aplicación podrá llevar cualquiera de estos caracteres; lo podremos cambiar en una propiedad de Screen1

¿Cómo crear una aplicación?

1. Diseñar la apariencia visual y los componentes que necesitará nuestra aplicación.
2. Definir el comportamiento mediante bloques (programación dirigida por eventos).
3. Podremos alternar entre ambas pantallas, diseño/bloques en cualquier momento y revisar los cambios “al vuelo” usando MIT AI2 Companion.

HolaMundoArduino: Vista Diseño



Paleta: contiene todos los componentes para crear nuestras aplicaciones

Visor: simula la pantalla del dispositivo móvil

Componentes: recoge la lista de componentes añadidos a la aplicación

Propiedades: para variar y configurar la apariencia de los componentes

HolaMundoArduino: Vista Bloques

The screenshot shows the 'HolaMundoArduino' web application interface. The top navigation bar includes the MIT App Inventor logo and links for 'Proyectos', 'Conectar', 'Generar', 'Settings', and 'Ayuda'. The right side of the top bar shows 'Mis proyectos', 'Gallery', 'Guía', 'Informar de un problema', 'Español', and a user email. Below this, a green bar contains the app name 'HolaMundoArduino', a dropdown for 'Screen1', and buttons for 'Añadir ventana' and 'Eliminar ventana'. On the far right of this bar are 'Diseñador' and 'Bloques' tabs.

The main interface is divided into two panels. The left panel, titled 'Bloques', contains a list of components under 'Integrados' (Control, Lógica, Matemáticas, Texto, Listas, Colores, Variables, Procedimientos) and 'Screen1' (Imagen1, Botón1). A 'Cualquier componente' option is at the bottom. Below the list are 'Cambiar nombre' and 'Borrar' buttons. The right panel, titled 'Visor', is the workspace for building the app. It contains several annotations with arrows pointing to specific UI elements:

- 'Copiar/Pegar bloques' points to a clipboard icon in the top right of the workspace.
- 'Comunes a cualquier aplicación' points to a bracket grouping 'Control', 'Lógica', and 'Matemáticas' in the 'Integrados' list.
- 'Dependientes de los componentes agregados' points to a bracket grouping 'Texto', 'Listas', 'Colores', 'Variables', and 'Procedimientos' in the 'Integrados' list.
- 'Genéricos a los componentes agregados' points to an arrow from 'Cualquier componente' to the workspace.
- 'Ficheros que usará nuestra app' points to a bracket grouping 'Imagen1' and 'Botón1' in the 'Screen1' list.
- 'Borra bloques' points to a trash can icon in the bottom right of the workspace.

At the bottom of the workspace, there are two status indicators (a warning triangle and a red X, both with a '0') and a 'Mostrar avisos' button.

MIT APP INVENTOR

Proyectos ▾ Conectar ▾ Generar ▾ Settings ▾ Ayuda ▾

Mis proyectos Gallery Guía Informar de un problema Español ▾ correoajose Luis@gmail.com ▾

HolaMundoArduino Screen1 ▾ Añadir ventana Eliminar ventana Diseñador Bloques

Bloques

Integrados

- Control
- Lógica
- Matemáticas
- Texto
- Listas
- Colores
- Variables
- Procedimientos

Screen1

- Imagen1
- Botón1

Cualquier componente

Cambiar nombre Borrar

Medios

- ledRojo.png
- ledGris.png

Subir archivo...

Visor

Copiar/Pegar bloques

Comunes a cualquier aplicación

Dependientes de los componentes agregados

Genéricos a los componentes agregados

Ficheros que usará nuestra app

Borra bloques

Mostrar avisos

Política de privacidad y condiciones de uso

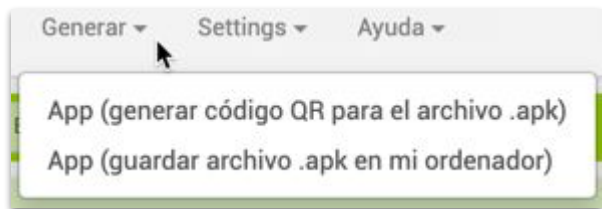
HolaMundoArduino: Vista Bloques



Probar / Instalar APK



MIT AI2 Companion nos permite ver cambios “en vivo” mientras desarrollamos.

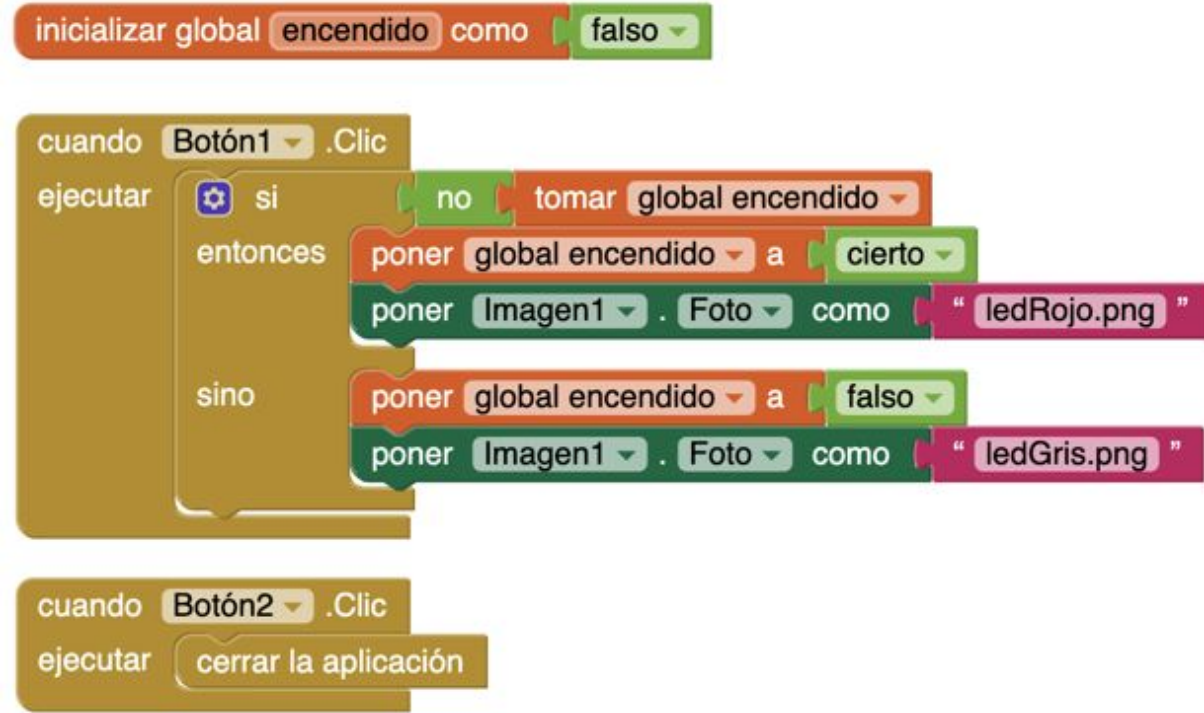
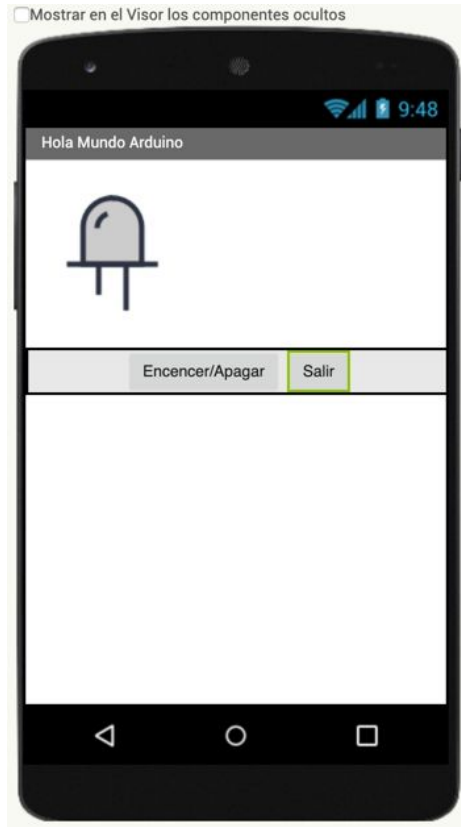


Si deseamos instalarla necesitamos generar el fichero APK y abrirlo en nuestro dispositivo

Notas importantes sobre la instalación

Instalar un APK en Android sin estar publicado en Google Play requerirá habilitar desde ***“Ajustes”*** del dispositivo, ***“Seguridad”***, la opción de ***“Orígenes desconocidos”***.

Mejorando la aplicación



Propuesta de actividad


- Añade un componente de tipo etiqueta que cambie su propiedad Texto de “Encendido” a “Apagado” y viceversa junto a los bloques del botón.



Usa convenientemente este bloque en el evento clic

Publicando en Gallery





PUBLISH

CANCEL

By submitting an app in the gallery, you are publishing it under a [Creative Commons Attribution License](#), and affirming that you have the authority to do so.

Hola Mundo en Arduino

[correoajoseluis](#)


Created Date: 2019/10/27
Changed Date: 2019/10/27

If this app has a tutorial or video, please enter the URL here.





Are you remixing code from other apps? Credit them here.

Aplicación desarrollada en el curso "Controlando Arduino desde el teléfono móvil"

Compartir nuestra creación



Hola Mundo en Arduino

 **correoajoseluis**    Like

Created Date: 2019/10/27

Changed Date: 2019/10/27

OPEN THE APP

EDIT

DESCRIPTION **SHARE** REPORT

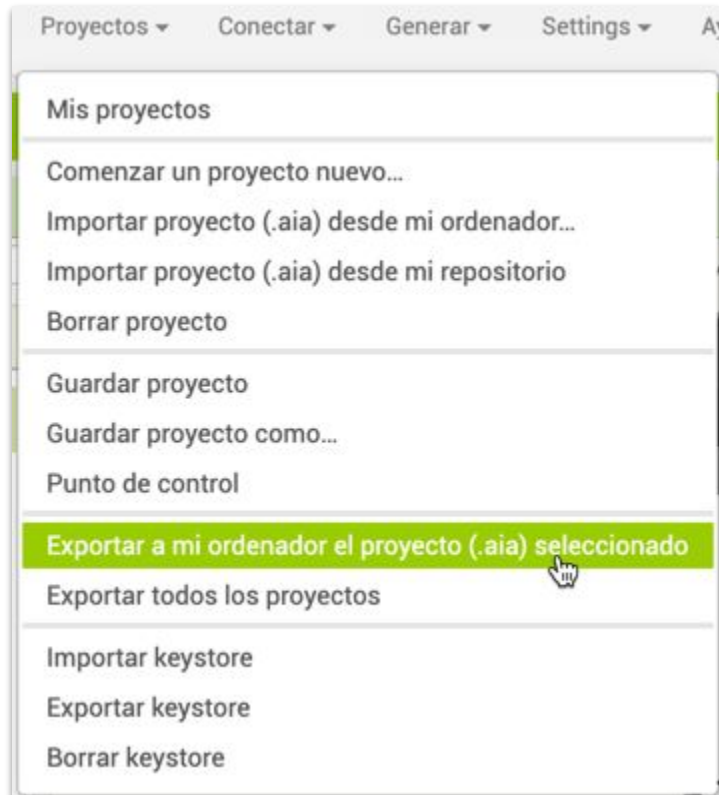
Copy and share link:

[Back to Gallery](#)

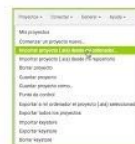
Publicar tu app en
Gallery



Exportar/importar el código fuente



- Compartimos los bloques con otros usuarios de AI2
- Copia de seguridad del código fuente(.AIA)



Referencias

- Emulador de [MIT App Inventor](#)
- Vídeos del [curso de “Desarrollo de aplicaciones móviles educativas con MIT App Inventor”](#)
- [Recursos multimedia](#) para tus aplicaciones
- [Enseñando con MIT App Inventor 2](#)
- [Comunidad de MIT App Inventor 2](#)

LICENCIA



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Las diapositivas son obra de Jose Pujol y Jose Luis Núñez creadas para el curso “Controlando Arduino desde el teléfono móvil” para el CEP de Sevilla

