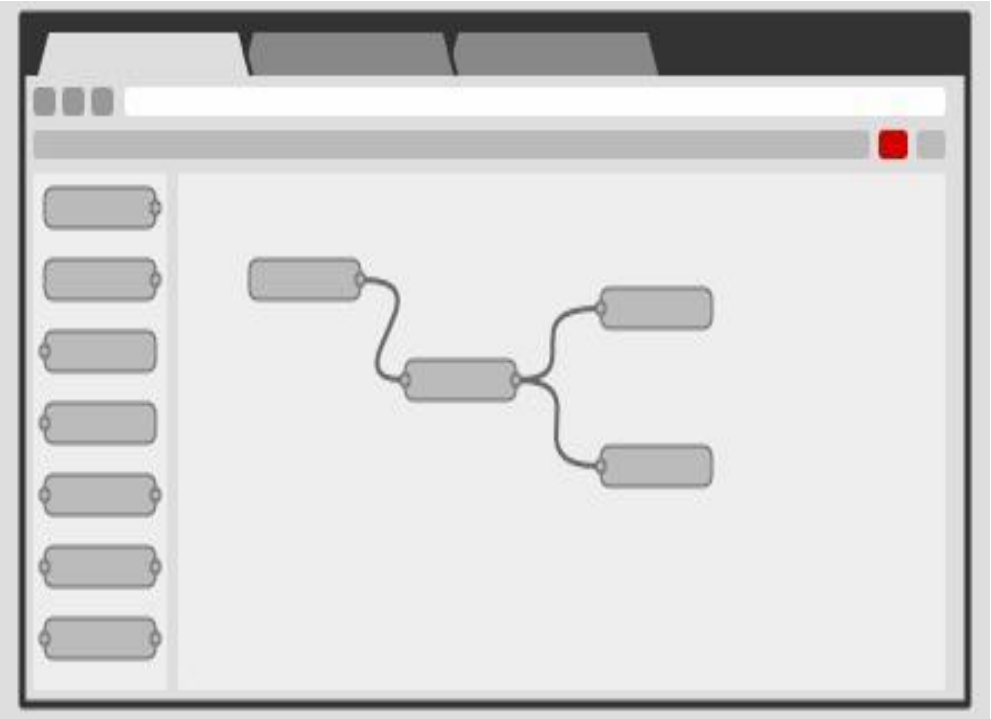
SMART PUBLIC RESTROOM

PHASE-4

MODULE 9: NODE -RED SERVICE

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.



Browser-based flow editing

Node-RED provides a browser-based flow editor that makes it easy to wire together flows using the wide range of nodes in the palette. Flows can be then deployed to the runtime in a single-click.

JavaScript functions can be created within the editor using a rich text editor.

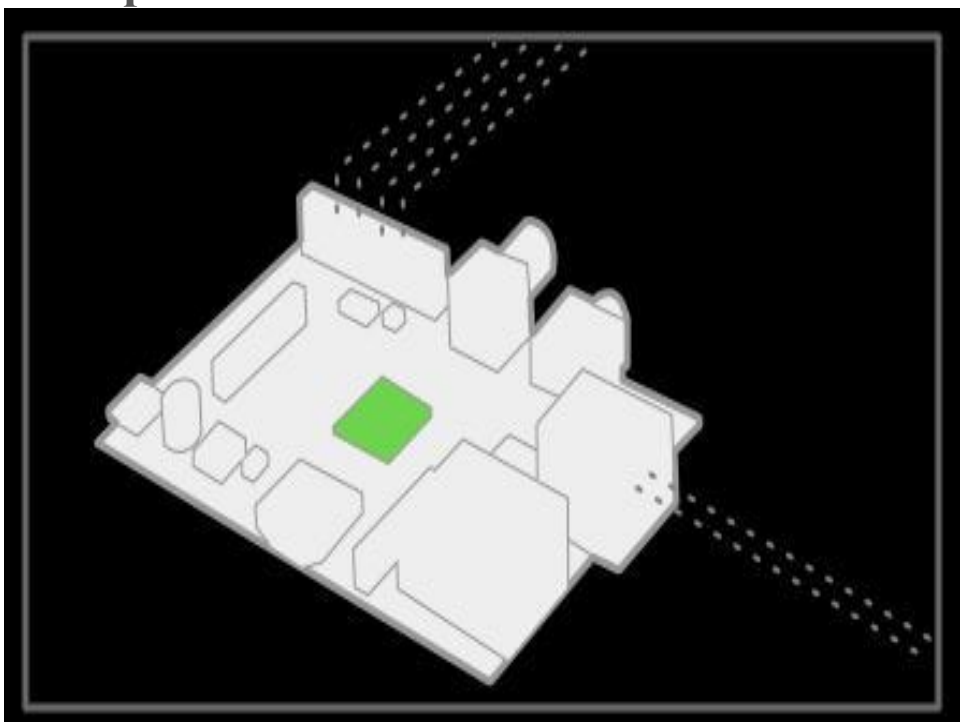
A built-in library allows you to save useful functions, templates or flows for re-use.

Built on Node.js

The light-weight runtime is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.

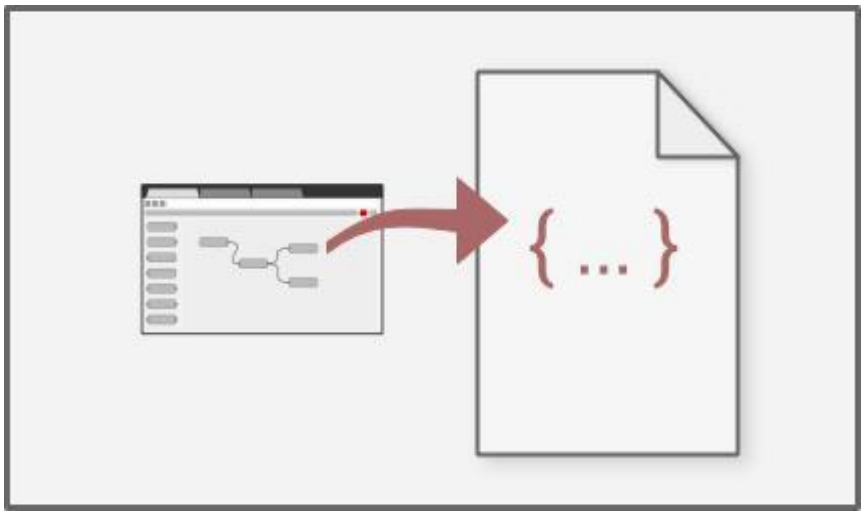
With over 225,000 modules in Node's package repository, it is easy to extend the range of palette nodes to add new capabilities.

Social Development



The flows created in Node-RED are stored using JSON which can be easily imported and exported for sharing with others.

An online flow library allows you to share your best flows with the world.

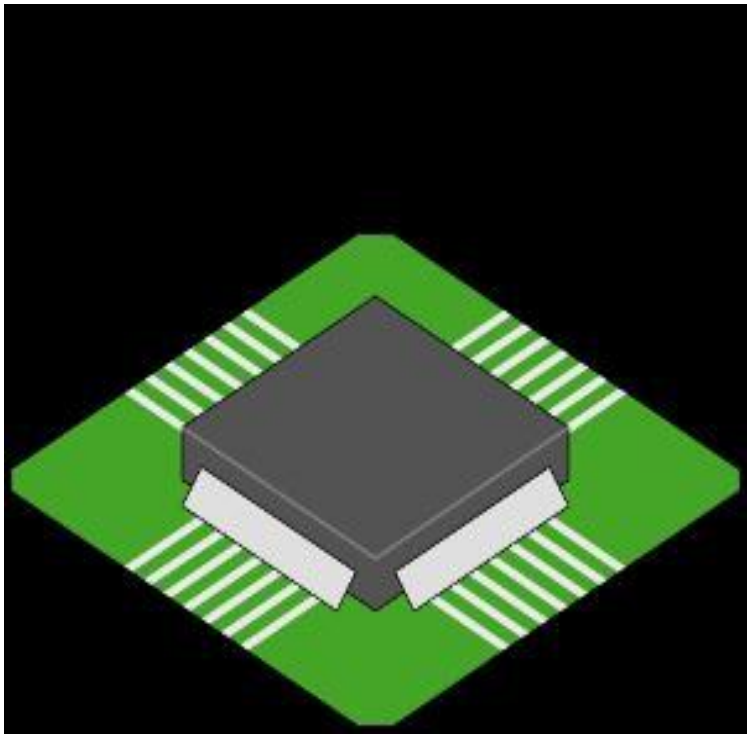


Get Started

Node-RED is built on Node.js, taking full advantage of its event-driven, non-blocking model. This makes it ideal to run at the edge of the network on low-cost hardware such as the Raspberry Pi as well as in the cloud.

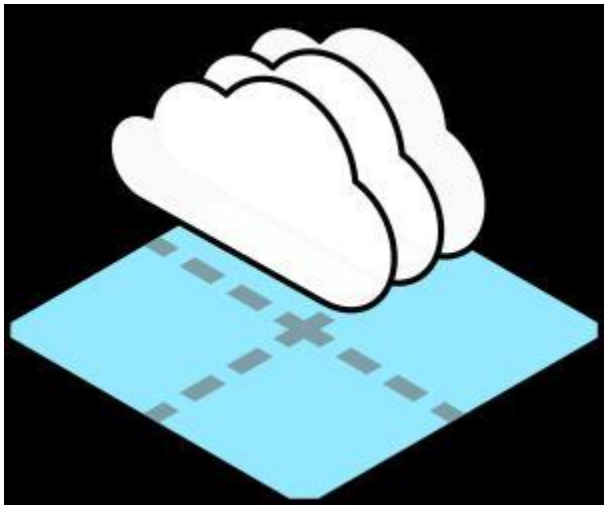
Run locally

- Getting started
- Docker



On a device

- Raspberry Pi
- BeagleBone Black
- Interacting with Arduino
- Android



In the cloud

- FlowFuse
- Amazon Web Services

- Microsoft Azure

MODULE 10: Mobile application development using MIT app inventor

Using MIT App Inventor, you can develop applications for Android devices using a web browser and a connected phone (or emulator). The App Inventor servers store your work and help you keep track of your projects.

Before you can use App Inventor, you need to set up your computer and install the App Inventor setup package.
Get setup package for: Mac | GNU/Linux | Windows

When you log in to the App Inventor server with a google account, at first you will see an empty project list. If you have completed the setup instructions, you will be ready to open up the Designer and Blocks Editor to get started on building apps. Just click the "New" button in the upper left to start a new project. The App Inventor Development tools run in two separate windows:

- **The Designer**, where you select the components for your app.
- **The Blocks Editor**, where you assemble program blocks that specify how the components should behave. You assemble programs visually, fitting pieces together like pieces of a puzzle.

App Inventor will display your app on a phone or emulator as you add pieces to it, so you can test your work as you build.

- **Phone:** App Inventor connects to your Android phone through a USB cord. (Follow phone setup instructions.)
- **Emulator:** If you don't have a phone, you can test your app using the emulator software that mimics an Android phone right on your computer screen. (The emulator is installed during App Inventor Setup).

When you're done, you can package your app and produce a stand-alone application for installation on other phones. Get started building your first app with the emulator or with the phone. The App Inventor development environment is supported for Mac OS X, GNU/Linux, and Windows operating systems, and several popular Android phone models. Applications created with App Inventor can be installed on any Android phone. (See system requirements.

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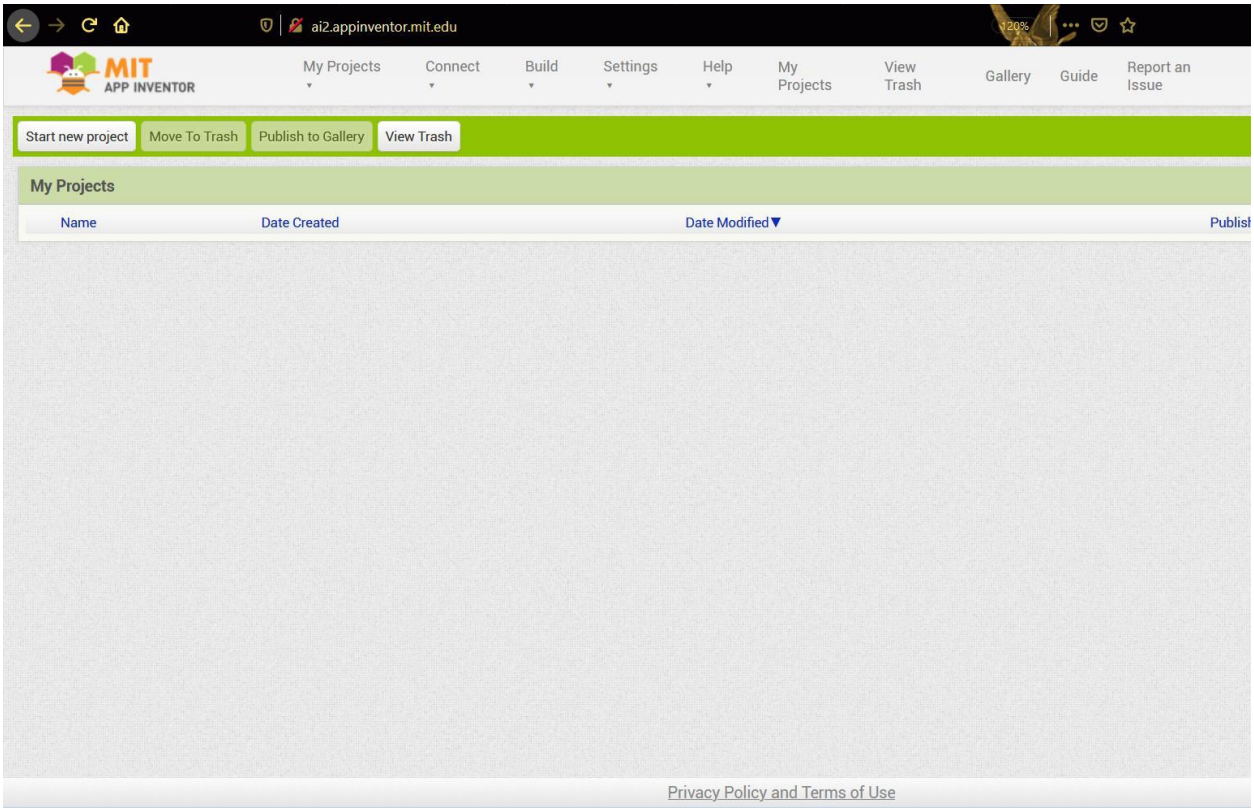
In recent years the internet has reached a large number of people across the world. And this has motivated all the people who own some businesses or people who want to connect to a large number of people to use and make mobile /laptop applications. These applications provide the customer with a way of easily exploring the content of the provider and it helps the provider with an ample opportunity to present their content more efficiently then they could when they were using websites.

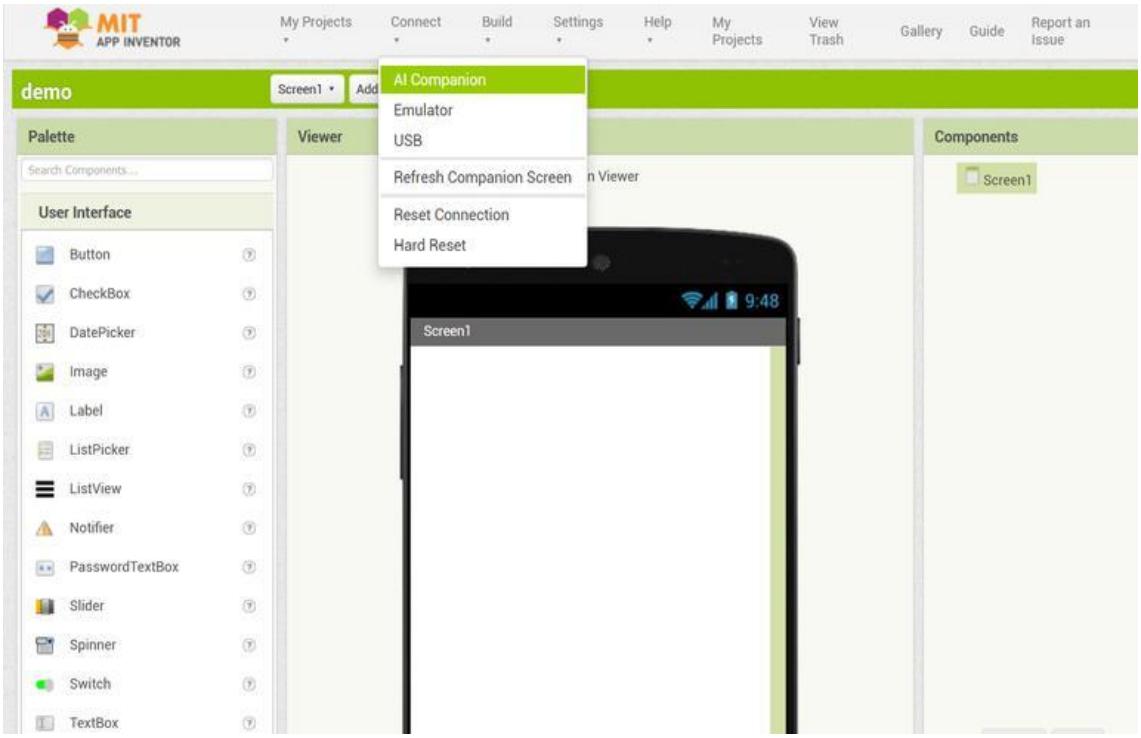
But not all people can make the applications. They require some medium to get their business on an application or an app. One way is to hire app developers. It can prove to be costly for some new business setters or the businessmen can be living in some remote part of the country where app developers are not present. Hence, to make app development easier MIT provides us with the MIT app inventor. This is a platform that makes app development easy for anyone who knows to code or not.

Steps to use MIT app inventor:

Step 1: Open a Gmail account in case you don't have one.
Step 2: Open the link and log in to your Gmail account.
Step 3: You need to install the App Inventor Companion App (MIT AI2 Companion) on our mobile device that helps in live testing of our application.
Step 4: We need to connect both mobile devices & laptops/desktop should be connected to the same WiFi network.
Step 5: To start the app-building click on "Start New Project".

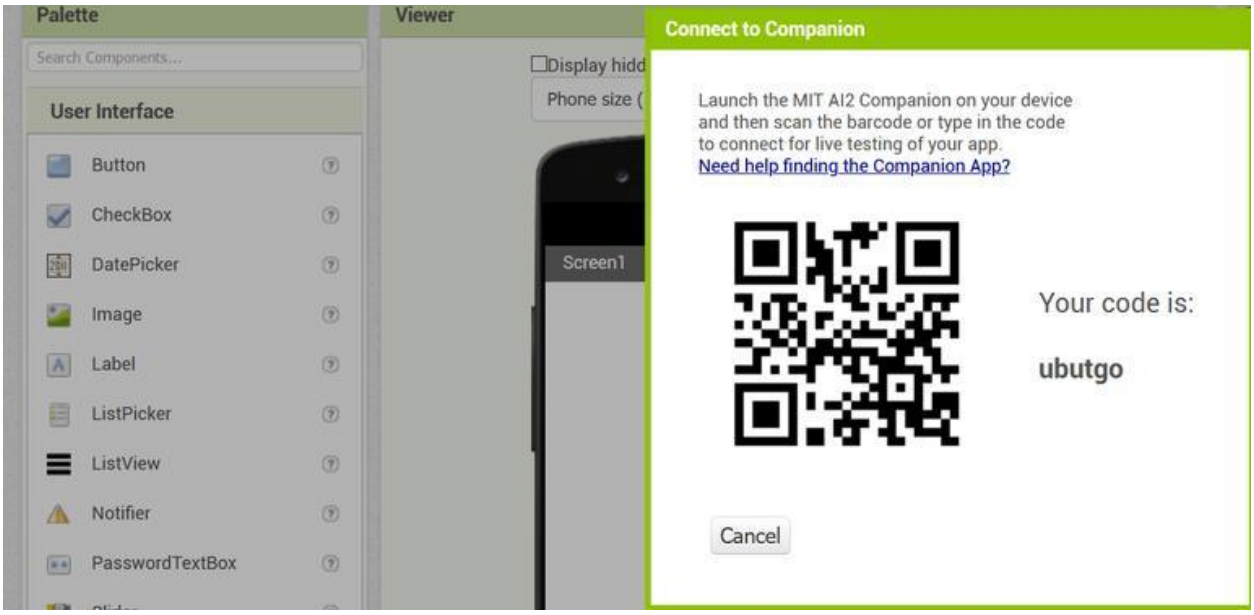
Step 6: To connect your mobile device,





choose “Connect” and “AI Companion” from the top menu.

Step 7: Now to connect the MIT AI2 App on your device and desktop/laptop scan the QR code or type the 6 digit code which is appearing on your PC screen.



Step 8: Now you can see the app you are building on your device.

Benefits of MIT app inventor:

- Everything is done through a select and drop manner. This means we can select a particular chunk of code and drop in our code. Hence, no typing.
- Easy to test your app. We can check the app developed on desktop or laptop with the app inventor application on our mobile phones.
- MIT provides the user with some basic lessons which help in building that apps and that helps in a proper understanding of how the MIT app inventor platform works for the user.
- Useful for novices.
- Power of native apps with a simple UI.

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