

Implementation of IoT with Raspberry Pi

What is Raspberry Pi?

Short for RPi, it is a credit-card-sized single-board computer built by the [Raspberry Pi](#) Foundation in association with Broadcom in the United Kingdom. It can do most of the things your typical desktop does, such as handling spreadsheets, word-processing, and games.

Raspberry Pi also has the capacity to play videos in high-definition. It can run several versions of Linux and is used to teach kids worldwide how to program. In fact, that was one of the biggest reasons why the idea of Raspberry Pi was conceived. But more on that later.

In addition, it has inputs and outputs for sensors so that you can attach all sorts of hardware to it. The General Purpose Input/Output (GPIO) pins on Raspberry Pi allow you to connect status lights, switches, analog signals, and more. You can use C++ or Python to control the board to sense or control devices attached to it.

Invented to stimulate the teaching of basic computer science in schools, Raspberry Pi has since then been used in many applications, including hobbyist projects, hardware platforms for electronics design, embedded devices, and robotics.

Implementation of IoT with Raspberry Pi :

Internet **of** **Things**

Creating an interactive environment

Network of devices connected together

Sensor

Electronic element

Converts physical quantity into electrical signals

Can be analog or digital

Actuator

Mechanical/Electro-mechanical device

Converts energy into motion

Mainly used to provide controlled motion to other components

System

Sensor and actuator interfaced with Raspberry Pi

Read data from the sensor

Control the actuator according to the reading from the sensor

Connect the actuator to a device

Overview

Requirements

DHT Sensor

4.7K ohm resistor

Relay

Jumper wires

Raspberry Pi

Mini fan



DHT

Digital Humidity and Temperature Sensor (DHT)

PIN 1,2,3,4 (from left to right)

PIN 1-3.3V - 5V Power supply

PIN 2- Data

PIN 3- Null

PIN 4 - Ground

Sensor

Relay

Mechanical/electromechanical

switch

3 output terminals (left to right)

NO (normal open)

Common

NC (normal close)

Temperature Dependent Auto Cooling System

Sensor interface with Raspberry Pi

Connect pin 1 of DHT sensor to the 3.3V pin of Raspberry Pi

Connect pin 2 of DHT sensor to any input pins of Raspberry Pi

Connect pin 4 of DHT sensor to the ground pin of the Raspberry Pi

Relay interface with Raspberry Pi

Connect the VCC pin of relay to the 5V supply pin of Raspberry Pi

Connect the GND (ground) pin of relay to the ground pin of Raspberry Pi

Connect the input/signal pin of Relay to the assigned output pin of Raspberry Pi

Adafruit provides a library to work with the DHT22 sensor

IoT uses of Raspberry Pi :

Raspberry Pi computers feature a set of General Purpose Input Output (GPIO) pins that provide connections to external electronic devices and therefore the development of IoT solutions. These GPIO pins can be connected to external sensors using either jumper wires or a ribbon cable. These subsequently connect the Pi to a breadboard (a solder-less, plug-and-play electronics board), enabling various application possibilities.

One such application is a Raspberry Pi IoT server. “With an in-built quadcore processor, Raspberry Pi can serve as the ‘Internet Gateway’ for IoT devices”, says Sanam Malhotra from Oodles AI. “Powered by a cloud network, Pi acts as a web server for uploading and transiting sensor data on IoT platforms. Custom code, an operating system, a Python library, and a cloud network are all it takes to use Pi Computer as a web server.

“Businesses can easily run and control IoT applications like smart home devices, weather stations, agricultural designs, and more using Raspberry Pi”, she adds.

