INTERNET OF THINGS

A PROJECT WORK ON

"HOME AUTOMATION USING ALEXA VOICE COMMAND"

SUBMITTED BY

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UNDER THE GUIDANCE OF

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ABSTRACT

The “Internet of things” (IoT) is becoming an increasingly growing topic of conversation both in the workplace and outside of it. It’s a concept that not only has the potential to impact how we live but also how we work. It is basically connecting smart devices to internet. Broadband Internet is become more widely available, the cost of connecting is decreasing, more devices are being created with Wi-Fi capabilities and sensors built into them, technology costs are going down, and smartphone penetration is sky-rocketing. All of these things are creating a “perfect storm” for the IoT.

There are various ways in IoT to control devices, one such way being voice command. A voice command device is a device controlled by means of the human voice. By removing the need to use buttons, dials and switches, consumers can easily operate appliances with their hands full or while doing other tasks. The voice-control, voice-assistant revolution in time will have us all talking to objects all over our homes and offices.

In this project, we use human voice to control devices at home. To achieve this, we have used **particle photon device,** which is connected to cloud, **Amazon voice services** through which voice command is given as input and software applications such as **Particle** to build codes and **IFTTT** to create recipes.

REQUIRMENTS

❖Hardware

1. Android mobile/Tablet PC

2. Particle Photon

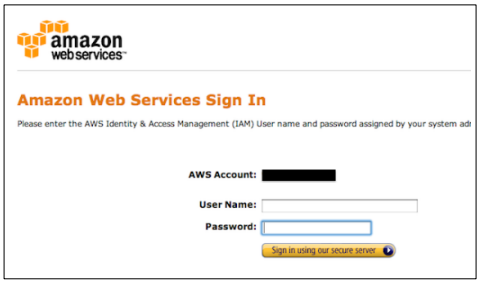
3.LED

4. Bread board

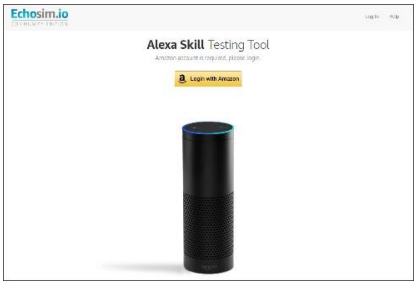
❖Software

1. IFTTT Website Registration

2. Particle cloud Registration



3. AWS (ALEXA) Registration



4. Echosim.io

SYSTEM DESCRIPTION

This project revolves around particle photon, IFTTT, Particle and Amazon voice services (AWS, Alexa). Here is a brief introduction of all these services:

The Photon is a $19 tiny Wi-Fi development kit for creating connected projects and products for the Internet of Things. The board itself uses a Broadcom Wi-Fi chip (one that can be found in Nest Protect, LIFX, and Amazon Dash) alongside a powerful STM32 ARM Cortex M3 microcontroller.

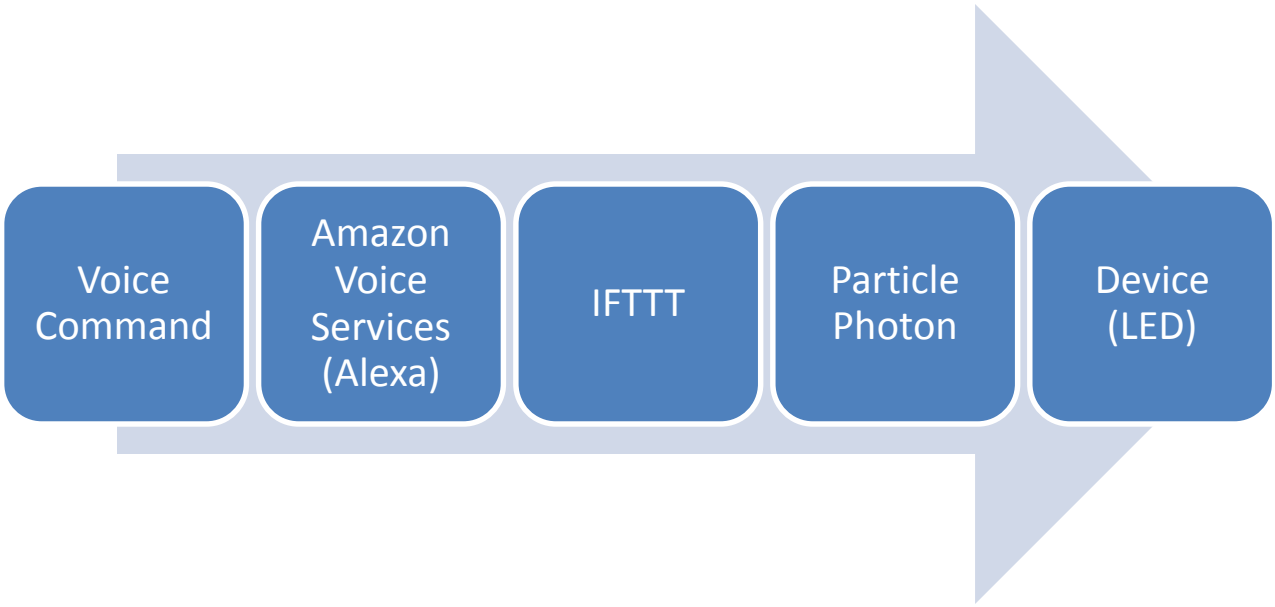
IFTTT gives you creative control over the products and apps you love. It is a free web-based service that allows users to create chains of simple conditional statements, called "recipes", which are triggered based on changes to other web services such as Gmail, Facebook, Instagram, and Pinterest. IFTTT is an abbreviation of "If This Then That".

The Particle is a secure, reliable gateway between your devices and the web. It helps us to see what's happening on each of our devices in real time. It helps safely reprogram our devices one at a time or all at once. We can stream our data to popular web services or our own databases. It has low-cost connected microcontrollers.

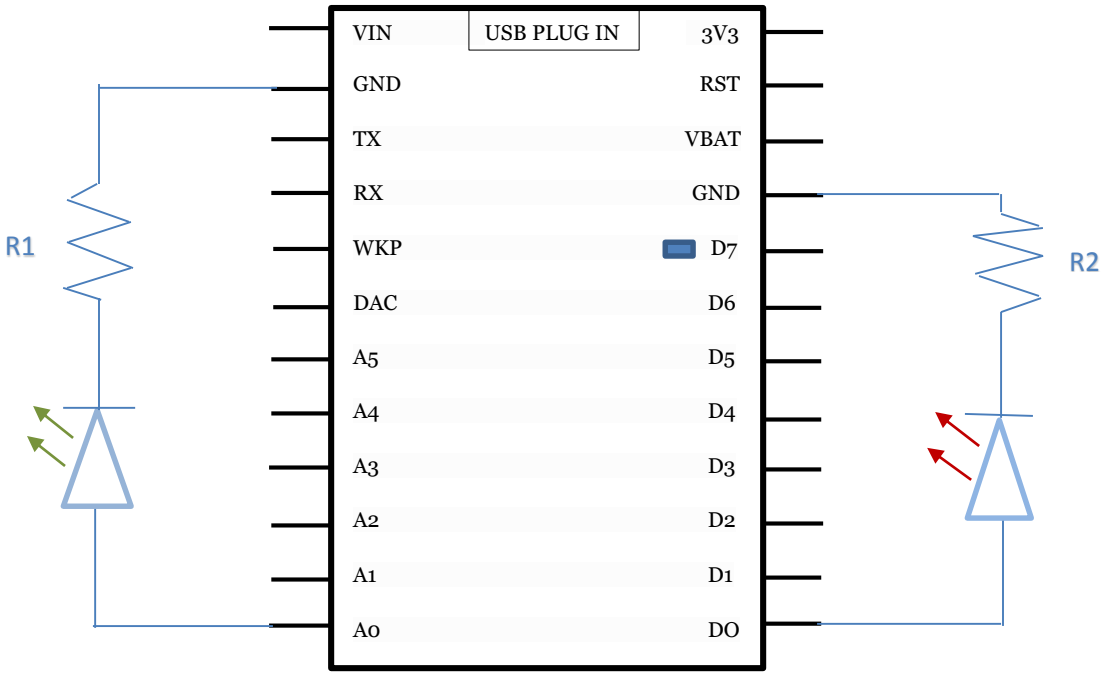
Alexa, the voice service that powers Echo, provides capabilities, or skills, that enable customers to interact with devices in a more intuitive way using voice. Examples of these skills include the ability to play music, answer general questions, and set an alarm or timer and more. Alexa is built in the cloud, so it is always getting smarter.

This project is a combination of Voice Technology, Cloud Networking and Embedded system. Here one has to configure AWS account. On the other hand connect a device with particle photon and configure it with Wi-Fi. Then write a code to control device on particle cloud. Then on IFTTT Website, create a recipe using ALEXA and particle cloud to control the device. Now by using echosim.io one can a send a voice command which is already registered to control the device.

BLOCK DIAGRAM



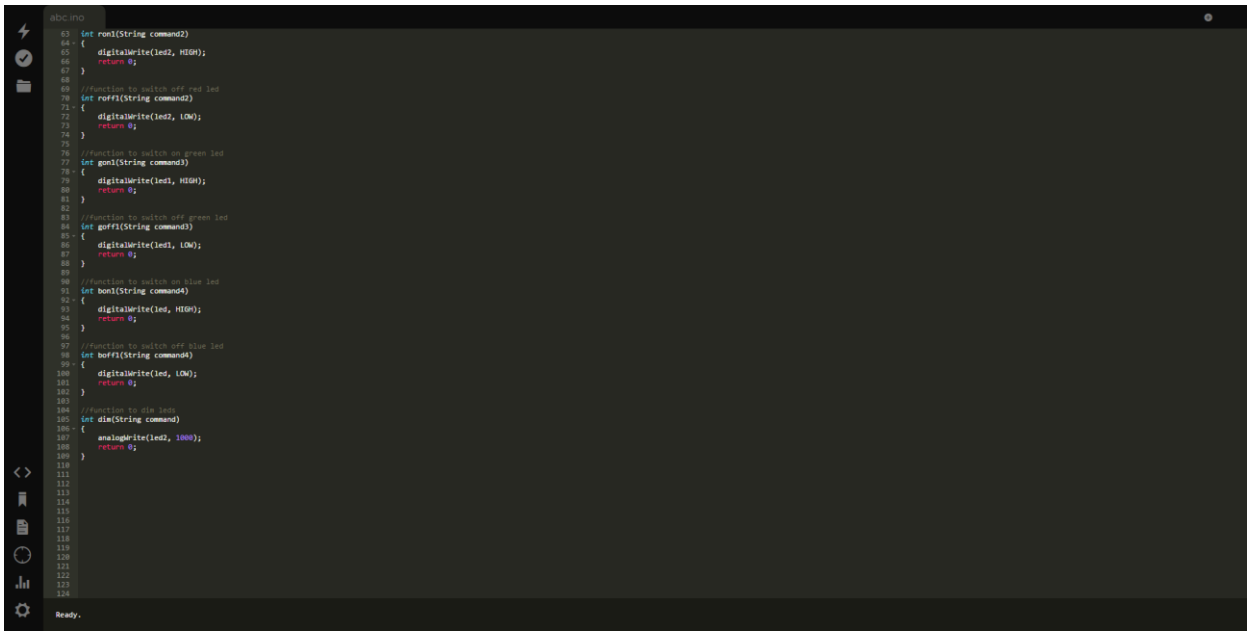
CIRCUIT DIAGRAM



CODE

```
/*---------------------------

Every program based on Wiring (programming language used by Arduino, and Particle devices) has two essential parts:
setup - runs once at the beginning of your program
loop - runs continuously over and over

This program will switch on and off D7 led and leds connected to pins A0 & D0 when the corresponding functions are called

-----------------------------*/

// First, we're going to make some variables.
// This is our "shorthand" that we'll use throughout the program:
int led = D7;   //on-board led
int led1 = A0;  //connect green led
int led2 = D0;  //connect red led

// The setup function is a standard part of any microcontroller program.
// It runs only once when the device boots up or is reset.
void setup()
{
    // We are going to tell our device that A0, D0 and D7 are going to be output
    // (That means that we will be sending voltage to them, rather than monitoring voltage that comes from them)
    pinMode(led, OUTPUT);
    pinMode(led1, OUTPUT);
    pinMode(led2, OUTPUT);
    Particle.function("on", on1);
    Particle.function("off", off1);
    Particle.function("red", ron1);
    Particle.function("red1", roff1);
    Particle.function("green", gon1);
    Particle.function("green1", goff1);
    Particle.function("blue", bon1);
    Particle.function("blue1", boff1);
    Particle.function("dim1", dim);
}

void loop()
{
    //This routine gets repeated over and over, as quickly as possible and as many times as possible, after the setup function is called.
    //In this program action is to be taken only after a function gets called.
    //Hence this part is kept blank.
}

//Function to switch on the leds
int on1(String command1)
{
    digitalWrite(led, HIGH);
    digitalWrite(led1, HIGH);
    digitalWrite(led2, HIGH);
    return 0;
}

//Function to switch off leds
int off1(String command)
{
    digitalWrite(led, LOW);
    digitalWrite(led1, LOW);
    digitalWrite(led2, LOW);
    return 0;
}

//Function to switch on red led
```

Ready.



```
int ron1(String command2)
{
    digitalWrite(led2, HIGH);
    return 0;
}

//Function to switch off red led
int roff1(String command2)
{
    digitalWrite(led2, LOW);
    return 0;
}

//function to switch on green led
int gon1(String command3)
{
    digitalWrite(led1, HIGH);
    return 0;
}

//Function to switch off green led
int goff1(String command3)
{
    digitalWrite(led1, LOW);
    return 0;
}

//function to switch on blue led
int bon1(String command4)
{
    digitalWrite(led, HIGH);
    return 0;
}

//Function to switch off blue led
int boff1(String command4)
{
    digitalWrite(led, LOW);
    return 0;
}

//function to dim leds
int dim(String command)
{
    analogWrite(led2, 1000);
    return 0;
}
```

Ready.

CONCLUSION & CHALLENGES

We have met our goal of controlling led by a voice command, given that the particle photon, and all the software (IFTTT, Particle & Echoism) are interconnected and are provided with a good internet facility.

In a similar way, lights at home can be controlled from almost anywhere.

With a good knowledge on electric devices and good coding ability, this project can also be used to control electric fans, microwave ovens and almost any device!!

The world is indeed growing smarter and smarter everyday!

“Anything that can be connected will be connected”.