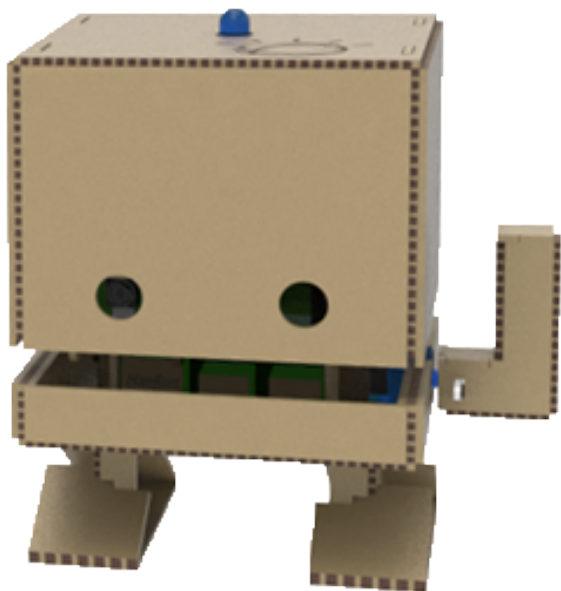


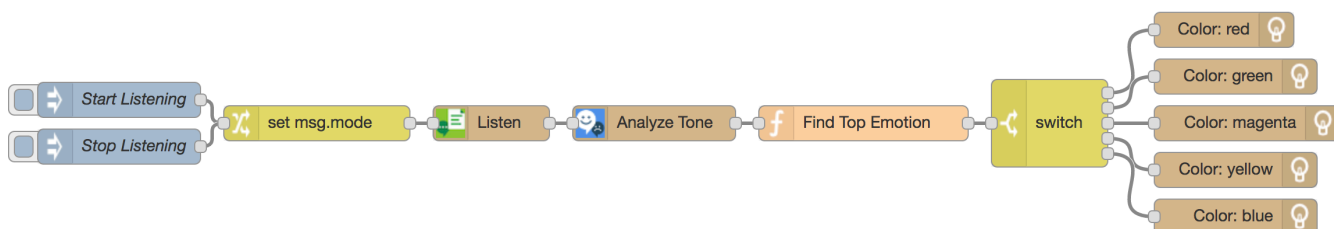
# Emotional LED Light

## TJBot Nodes in Node-RED

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*Use the function node to find top scoring emotion from Watson Tone Analyzer service.*



*Train TJBot to listen using the microphone and the Watson Speech to Text service, analyze emotions in the utterance with the Watson Tone Analyzer service, and control a LED light to represent most prevalent emotion.*




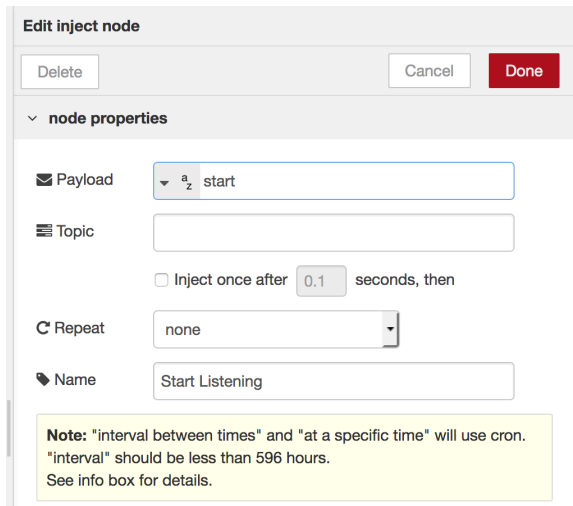
A digital copy of this lab and completed flow can be found at:  
<http://ibm.biz/node-red-tjbot-emotional-light>



# Train TJBOT to Listen and React to Emotions

In this lab, we'll use the listen and analyze tone nodes to train TJBOT to listen to utterances and analyze the emotion, lighting up an LED light based on which emotion is most prevalent. You will need a microphone and LED connected to the TJBOT for this lab.

1. In the Node-RED editor running on the Raspberry Pi, drag two  nodes onto the canvas. Double click on each node and configure as shown below.



**Edit inject node**

Delete Cancel Done

▼ node properties

✉ Payload

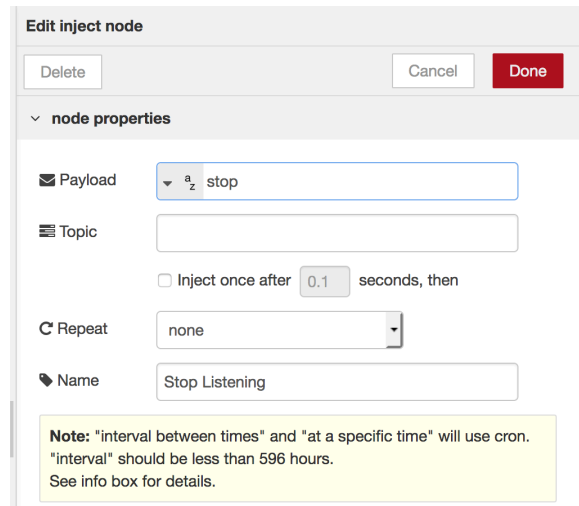
📄 Topic

☐ Inject once after  seconds, then

🔄 Repeat

📌 Name

**Note:** "interval between times" and "at a specific time" will use cron.  
"interval" should be less than 596 hours.  
See info box for details.



**Edit inject node**

Delete Cancel Done

▼ node properties

✉ Payload

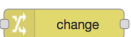
📄 Topic

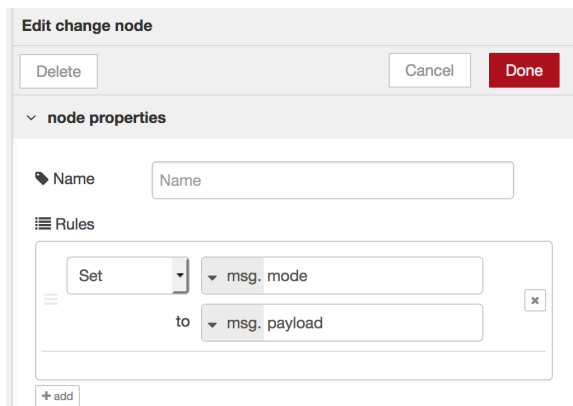
☐ Inject once after  seconds, then

🔄 Repeat

📌 Name

**Note:** "interval between times" and "at a specific time" will use cron.  
"interval" should be less than 596 hours.  
See info box for details.

2. Add a  node as shown below. This node will take the payload from the inject nodes and set the `msg.mode` property, which the listen node in the next step will use.



**Edit change node**

Delete Cancel Done

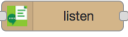
▼ node properties

📌 Name

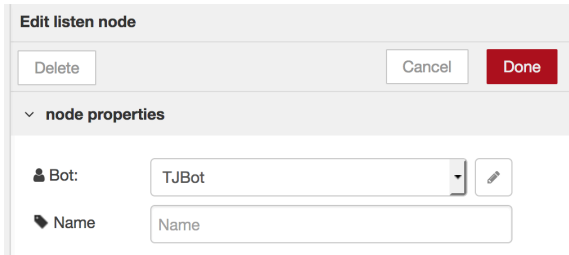
📄 Rules

Set  to

+ add

3. Add a  node as shown below. The listen node has several modes, start and stop, that can be configured programmatically using the `msg.mode` property to start and stop listening. When listening is enabled, the listen node produces messages as TJBot hears and transcribes words, with the text being passed in the `msg.payload` property.

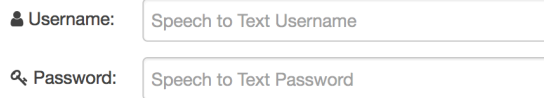
The listen node uses the Watson Speech to Text service, which requires service credentials from IBM Cloud. Click on the pencil icon to the right of the **Bot** dropdown menu.



The dialog box titled "Edit listen node" contains a "Delete" button, a "Cancel" button, and a red "Done" button. Below these is a section for "node properties". It includes a "Bot" dropdown menu with "TJBot" selected and a pencil icon to its right, and a "Name" text input field with the placeholder text "Name".

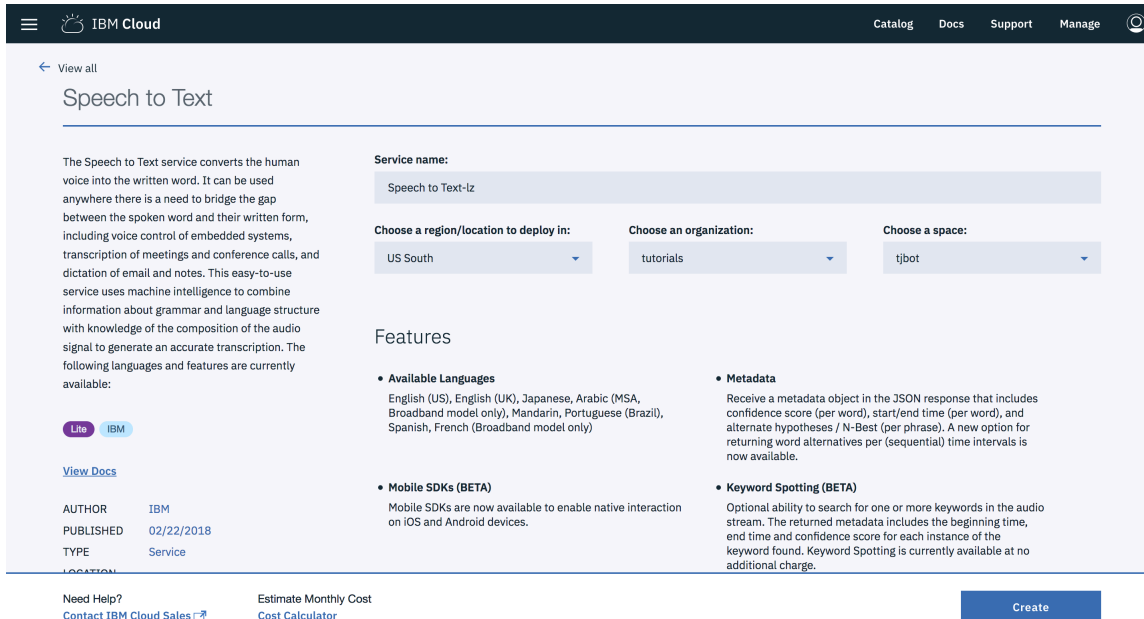
4. Click on the link icon next to the **Speech to Text** heading to launch into the IBM Cloud console and create a Watson Speech to Text service instance.

#### Speech to Text



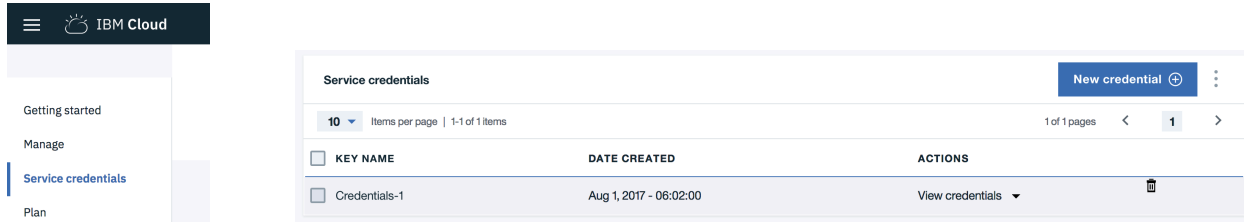
The form contains two input fields: "Username" with the placeholder text "Speech to Text Username" and "Password" with the placeholder text "Speech to Text Password".

5. If you don't have an IBM Cloud account, sign up at [bluemix.net](https://bluemix.net). Sign into your account if prompted. Leave the service name as is and click **Create**.



The page shows the "Speech to Text" service in the IBM Cloud console. It includes a description of the service, a "Service name" field with "Speech to Text-lz", and three dropdown menus for "Choose a region/location to deploy in:" (US South), "Choose an organization:" (tutorials), and "Choose a space:" (tjbot). The "Features" section lists "Available Languages", "Mobile SDKs (BETA)", "Metadata", and "Keyword Spotting (BETA)". At the bottom, there are links for "Need Help?", "Contact IBM Cloud Sales", "Estimate Monthly Cost", "Cost Calculator", and a blue "Create" button.

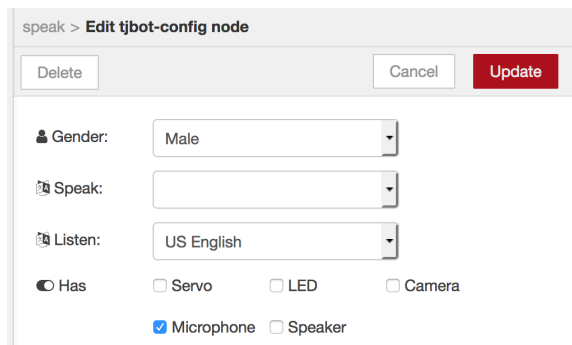
6. Click on **Service Credentials** in the menu on the left. If there are no credentials in the list, click **New credential** and **Add** to create a set of credentials. Click on **View Credentials** to display the service credentials.



7. Copy the username and password into the fields back in the Node-RED editor under the **Speech to Text** section.

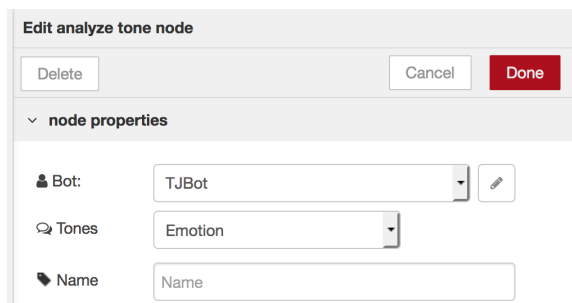


8. At the top of the configuration window, select **US English (US dialect)** from the **Listen** dropdown menu. Enable the microphone by ticking the checkbox labeled **Microphone**.

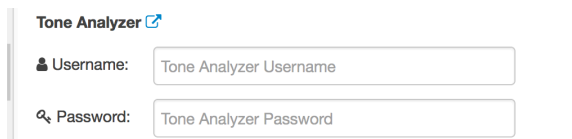


9. Add a **analyze tone** node as shown below. Select **Emotion** from the **Tones** dropdown menu.

The analyze node uses the Watson Tone Analyzer service, which requires service credentials from IBM Cloud. Click on the pencil icon to the right of the **Bot** dropdown menu.



10. Click on the link icon next to the **Tone Analyzer** heading to launch into the IBM Cloud console and create a Watson Tone Analyzer service instance.



11. Leave the service name as is and click **Create**.

IBM Cloud

View all

# Tone Analyzer

People show various tones, such as joy, sadness, anger, and agreeableness, in daily communications. Such tones can impact the effectiveness of communication in different contexts. Tone Analyzer leverages cognitive linguistic analysis to identify a variety of tones at both the sentence and document level. This insight can then be used to refine and improve communications. It detects three types of tones, including emotion (anger, disgust, fear, joy and sadness), social propensities (openness, conscientiousness, extroversion, agreeableness, and emotional range), and language styles (analytical, confident and tentative) from text.

**Service name:**  
Tone Analyzer-5p

**Choose a region/location to deploy in:**  
US South

**Choose an organization:**  
tutorials

**Choose a space:**  
tjbot

## Pricing Plans

Monthly prices shown are for country or region: [United States](#)

PLAN	FEATURES	PRICING
✓ Lite	2,500 API Calls per Month	Free
The Lite plan gets you started with 2,500 API calls per month at no cost. Lite plan services are deleted after 30 days of inactivity.		
Standard	First 1000 API calls each month are free	

Need Help? [Contact IBM Cloud Sales](#)

Estimate Monthly Cost [Cost Calculator](#)

**Create**

12. Click on **Service Credentials** in the menu on the left. If there are no credentials in the list, click **New credential** and **Add** to create a set of credentials. Click on **View Credentials** to display the service credentials.

IBM Cloud

- Getting started
- Manage
- Service credentials**
- Plan
- Connections

### Service credentials

[New credential](#)

10 Items per page | 1-1 of 1 items | 1 of 1 pages

KEY NAME	DATE CREATED	ACTIONS
Credentials-1	Aug 1, 2017 - 06:28:51	<a href="#">View credentials</a>

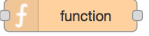
13. Copy the username and password into the fields back in the Node-RED editor under the **Tone Analyzer** section.

```
{  "url": "https://gateway.watsonplatform.net/tone-analyzer/api",  "username": "6e3454ed-7b74-4e7f-b169-c6603b58ad56",  "password": "QrmEK64YsyuM"}
```

**Tone Analyzer**

**Username:** 6e3454ed-7b74-4e7f-b169-c6603b58ad56

**Password:** .....

14. Watson Tone Analyzer returns scores for five emotions: anger, disgust, fear, joy, and sadness. Use a  node to find the emotion that scores the highest.

**Edit function node**

Delete Cancel Done

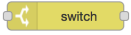
▼ node properties

Name

Find Top Emotion

Function

```
1 var emotions = msg.response.tones;
2
3 msg.payload = emotions[Object.keys(emotions)
4   .reduce(function(a, b){
5     return emotions[a].score > emotions[b].score ? a : b
6   }
7   )];
8
9 return msg;
10
```

15. Add a  node to test which emotion scored highest as shown below.

**Edit switch node**

Delete Cancel Done

▼ node properties

Name

Property

msg.payload.tone\_id

==	anger	→ 1	x
==	disgust	→ 2	x
==	fear	→ 3	x
==	joy	→ 4	x
==	sadness	→ 5	x

+ add

stopping after first match

☐ recreate message sequences

16. Add five shine nodes, each with a color representing one of the emotions: red (anger), green (disgust), magenta (fear), yellow (joy), and blue (sadness).

**Edit shine node**

Delete Cancel Done

▼ node properties

Bot: TJBot

Mode: Shine

Color: red

Name: Name

**Edit shine node**

Delete Cancel Done

▼ node properties

Bot: TJBot

Mode: Shine

Color: green

Name: Name

**Edit shine node**

Delete Cancel Done

▼ node properties

Bot: TJBot

Mode: Shine

Color: magenta

Name: Name

**Edit shine node**

Delete Cancel Done

▼ node properties

Bot: TJBot

Mode: Shine

Color: yellow

Name: Name

**Edit shine node**

Delete Cancel Done

▼ node properties

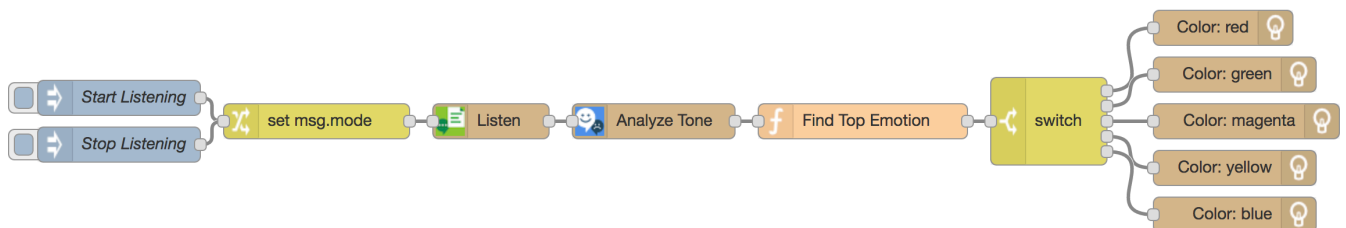
Bot: TJBot

Mode: Shine

Color: blue

Name: Name

17. Connect the nodes together as shown below.



18. Click on the **Deploy** button in the top-right corner of the Node-RED editor to save and deploy the changes.
19. Click on the tab to the left of the inject node labeled **Start Listening** to activate the microphone. Speak into the microphone and wait for the LED to turn the color that represents the emotion that's most prevalent. Click on the tab to the left of the inject node labeled **Stop Listening** to deactivate the microphone.