

Learn Session Training



IBM Watson Expert Services

Lab Exercise

Topic: Expert Services Learn – Watson Tone Analyzer Service

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Lab Overview

This lab guides you through the configuration steps required to use Watson Tone Analyzer service. Watson Tone Analyzer will be used to monitor customer support conversations. Escalate customer conversations when they turn sour, or find opportunities to improve customer service scripts, dialogs and customer journeys. Tones detected with this endpoint include frustrated, sad, satisfied, excited, polite, impolite and sympathetic.

Change Log

Revision History: Changes to this document are summarized in the following table in reverse chronological order (latest version first).

Revision	Date	Author	Short Description of Changes
0.2	11/07/18	Suj Perepa	Reviewed and provided feedback
0.1	11/01/18	Victor Povar	Wrote initial draft

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Course overview

Credits

This project is a collaborative effort of many experts within and outside of Watson in the hopes of broadening skills within IBM, our clients, partners and the developer community.

If you have suggestions for how to improve this guide, please send a note to victorp@ca.ibm.com.

Objectives

During the first lab, you will use the Tone Analyzer, Cloud Object Storage and Watson Studio services to analyze and monitor the tone with an email. As part of the second lab, you will integrate Watson Assistant, Tone Analyzer and Cloud Functions to tailor the answers returned by the Watson Assistant service.

The tasks and tools that are covered within the Lab allow you to perform and complete all necessary steps to use Tone Analyzer to derive insights from production conversations as well as extend the Watson Assistant service to provide a tailored user experience.

Lab Structure

The labs include explanations for reference to support the general understanding of the subject matter and to get a better sense of what you are actually doing.

To complete the exercises, you only need to perform numbered steps.

This lab exercise is designed for every student to work independently using a Mac or PC.

Each student requires access to an IBM Cloud account to provision the required services as well as complete the lab instructions.

Preparation

To prepare for the lab exercises, locate the Lab folder provided to you by your instructor. Make sure to unzip the Lab Folder to a directory on your local hard drive.

The lab folder contains the following files:

File name	Description
ToneAnalyzerLearn/	Folder contains the Instruction Guide
ToneAnalyzerLearn/data	Folder containing sample data files

1 Getting Started

This Lab can be performed using a Windows, Mac OS X or Linux system. The current version of this guide has screen shots taken from a Mac OS X computer, your results may vary according to the operating system you use.

1.1 Overview

This lab guides you through the steps required to use Watson Tone Analyzer Service Application Programming Interfaces (APIs). The APIs will be accessed via command line or through a development environment of your choice for all configurations and queries. The training examples used in this tutorial are not tailored to a specific domain.

1.2 Working with Watson Developer Cloud

1.2.1 IBM Cloud

[IBM Cloud](#) is an implementation of IBM's Open Cloud Architecture that leverages Cloud Foundry to enable developers to rapidly build, deploy, and manage their cloud applications. The purpose of this guide is not to introduce you to IBM Cloud, which you should already be familiar with, at least on a high level.

1.2.2 Watson Developer Cloud (WDC)

IBM Watson Developer Cloud (WDC) is a platform of cognitive services, designed for developers to build solutions that extract insight from their custom data. Cognitive computing systems learn and interact naturally with humans to augment their ability to make better decisions from data. As such, the Watson Developer Cloud services offer a variety of services that cover various aspects of natural interaction including text (Natural Language Understanding, Natural Language Classifier, Assistant and Discovery), images (Visual Recognition) and speech (Speech to Text and Text to Speech). Furthermore, WDC offers services to understand a user's personality (Personality Insights), emotional/social tone (Tone Analyzer) and translation (Watson Translator) in a scalable manner.

Watson Tone Analyzer Service

All Categories	AI				
Compute Containers Networking Storage AI > Analytics Databases Developer Tools Integration Internet of Things Security and Identity Starter Kits Web and Mobile Web and Application	<p>Watson Assistant (formerly Conversation) Lite • IBM</p> <p>Add a natural language interface to your application to automate interactions with your end users. Common applications include virtual agents and chat bots that</p>	<p>AI OpenScale Lite • IBM</p> <p>IBM AI OpenScale is an enterprise-grade environment for AI infused applications that provides enterprises with visibility into how AI is being built, used, and</p>	<p>Compare Comply IBM • Beta</p> <p>Process governing documents to convert, identify, classify, and compare important elements</p>	<p>Discovery Lite • IBM</p> <p>Add a cognitive search and content analytics engine to applications.</p>	
	<p>Knowledge Catalog Lite • IBM</p> <p>Discover, catalog, and securely share enterprise data.</p>	<p>Knowledge Studio Lite • IBM</p> <p>Teach Watson the language of your domain.</p>	<p>Language Translator Lite • IBM</p> <p>Translate text, documents, and websites from one language to another. Create industry or region-specific translations via the service's customization capability.</p>	<p>Machine Learning Lite • IBM</p> <p>IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.</p>	
	<p>Natural Language Classifier IBM</p> <p>Natural Language Classifier uses advanced natural language processing and machine learning techniques to create custom classification models. Users train</p>	<p>Natural Language Understanding Lite • IBM</p> <p>Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more.</p>	<p>Personality Insights Lite • IBM</p> <p>The Watson Personality Insights derives insights from transactional and social media data to identify psychological traits</p>	<p>Speech to Text Lite • IBM</p> <p>Low-latency, streaming transcription</p>	
	<p>Text to Speech Lite • IBM</p> <p>Synthesizes natural-sounding speech from text.</p>	<p>Tone Analyzer Lite • IBM</p> <p>Tone Analyzer uses linguistic analysis to detect three types of tones from communications: emotion, social, and language. This insight can then be used to drive</p>	<p>Visual Recognition Lite • IBM</p> <p>Find meaning in visual content! Analyze images for scenes, objects, faces, and other content. Choose a default model off the shelf, or create your own custom</p>	<p>Watson Studio Lite • IBM</p> <p>Embed AI and machine learning into your business. Create custom models using your own data.</p>	

1.2.3 Watson Tone Analyzer

Watson Tone Analyzer uses linguistic analysis to detect three types of tones from communications: emotion, social, and language. This insight can then be used to drive high impact communications. Tone Analyzer service comes with an easy-to-use API to translate content via cURL, Node.js, Java or Python. Use of Tone Analyzer entails the following steps:

- Creating the service instance;
- Choosing the endpoint;
- Integrating with complimentary service;

Tone Analyzer service can also be used in combination with other Watson services to create end-to-end solutions. For instance, combined with Watson Assistant and Watson Speech Services one can build high impact chat bot applications that listen to the end user and provide answers that are tailored to the user's current state of mind.

1.3 Prerequisites

This section provides instructions to help you get started quickly with the IBM Watson Developer Cloud services using Python as your programming runtime environment. You will be guided through examples to let you experiment with the available services.

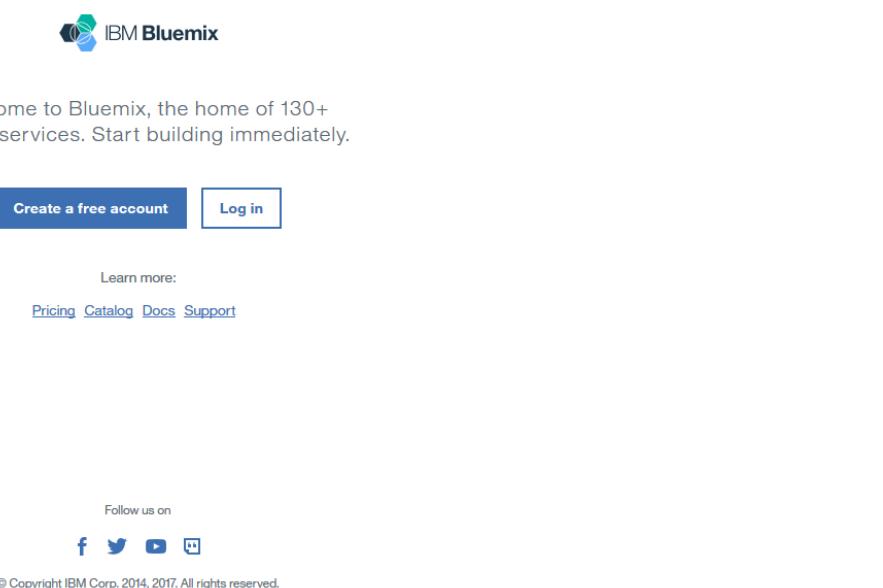
1.3.1 Obtaining an IBM Cloud account

IBM Cloud is a cloud Platform as a Service (PaaS), which allows you to host your application online and bind it to a variety of Software as a Service (SaaS) offerings from IBM including Watson analytic services. If you are new to IBM Cloud, you can create a trial account at the [IBM Cloud site](#).

1. Direct your browser to the IBM Cloud home page: <https://console.ng.bluemix.net/home/> to access your dashboard
2. If you do not yet have an IBM Cloud account, click **Sign Up** on the top right
3. Enter requested information and click **Create Account**
4. If you use your personal email address, you have 30 days to evaluate IBM Cloud. Some services, such as Watson Discovery Service, are free for limited use during the trial period.

1.4 Creating Your Tone Analyzer Instance

1. Navigate to IBM Cloud - <https://console.ng.bluemix.net/> and click on Log In



2. Use your organization credentials to Log in to IBM Cloud. These were created and given to you when you signed up to IBM Cloud.
3. Once logged in, navigate to the IBM Cloud Catalog by clicking on Catalog in the top left-hand corner. Next select the AI category from the category navigation. Alternatively, you can follow this link - <https://console.ng.bluemix.net/catalog/?category=ai>

Watson Tone Analyzer Service

4. Click on the Tone Analyzer tile in the IBM Cloud catalog:

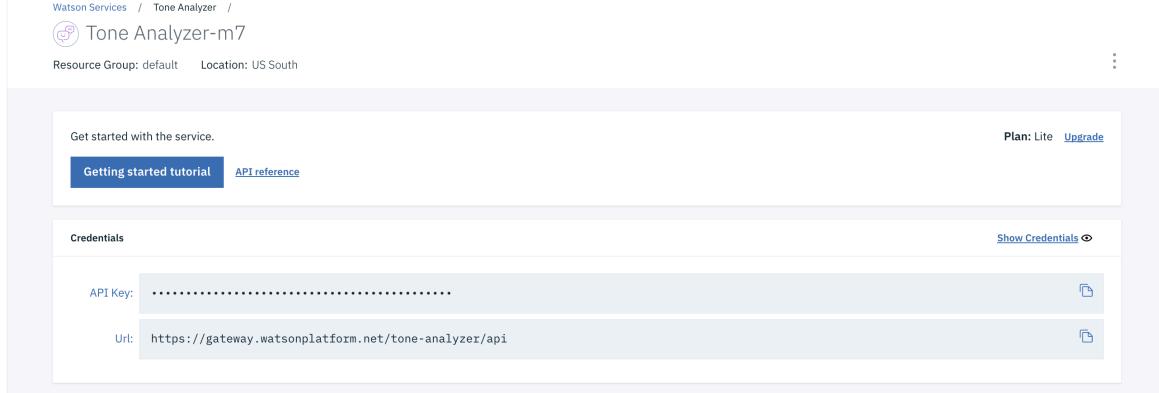
The screenshot shows the IBM Cloud catalog interface. On the left, there's a sidebar with 'All Categories' and a 'AI' section expanded, showing sub-categories like Compute, Containers, Networking, Storage, Analytics, Databases, Developer Tools, Integration, Internet of Things, Security and Identity, Starter Kits, Web and Mobile, and Web and Application. The 'Tone Analyzer' service is highlighted with a blue border. Other visible services include Watson Assistant (formerly Conversation), AI OpenScale, Compare Comply, Discovery, Knowledge Catalog, Knowledge Studio, Language Translator, Machine Learning, Natural Language Classifier, Natural Language Understanding, Personality Insights, Speech to Text, Text to Speech, and Watson Studio.

5. Within this window, do not make any changes to the Credential name or Service name. Create a trial service instance by selecting the Lite Plan option (default setting) and by clicking Create.

This screenshot shows the 'Tone Analyzer' service creation page. At the top, it says 'Tone Analyzer' and 'Lite • IBM'. Below that is a detailed description of the service: '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, extraversion, agreeableness, and emotional range), and language styles (analytical, confident and tentative) from text.' There are tabs for 'View Docs' and 'Terms'. To the right, there are fields for 'Service name' (set to 'Tone Analyzer-2w'), 'Choose a region/location to deploy in' (set to 'US South'), and 'Select a resource group' (set to 'default'). Below these is a 'Pricing Plans' section. It shows three plans: 'Lite' (selected), 'Standard', and 'Premium'. The 'Lite' plan is described as getting you started with 2,500 API calls per month at no cost, with a note that it's deleted after 30 days of inactivity. The 'Standard' plan offers 1,000 API calls each month. The 'Premium' plan offers a single tenant instance of one or more Watson services for better isolation and security, with compute-level isolation on the existing shared platform, as well as end-to-end encrypted data while in transit and at rest. At the bottom, there are links for 'Need Help?', 'Contact IBM Cloud Support', 'Estimate Monthly Cost', and 'Cost Calculator', along with a 'Create' button.

Watson Tone Analyzer Service

6. IBM Cloud will now instantiate your personal Tone Analyzer instance. It will automatically guide you to the service dashboard.

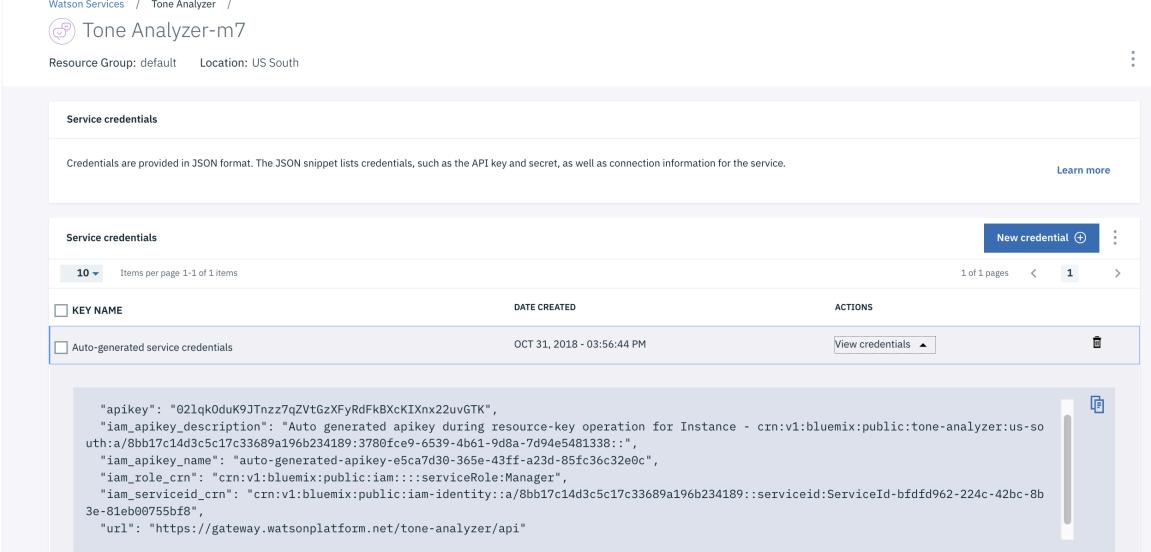


The screenshot shows the Watson Tone Analyzer service dashboard. On the left, there's a sidebar with 'Manage' (selected), 'Service credentials' (selected), 'Plan', and 'Connections'. The main area has a breadcrumb path 'Watson Services / Tone Analyzer / Tone Analyzer-m7'. It shows 'Resource Group: default' and 'Location: US South'. Below this, there's a 'Get started with the service.' section with 'Getting started tutorial' and 'API reference' buttons. A 'Plan: Lite Upgrade' button is also present. Under 'Credentials', it shows an 'API Key' field containing a long string of characters and a 'Url' field with the value 'https://gateway.watsonplatform.net/tone-analyzer/api'. There are download icons next to both fields.

If you close the tab and wish to re-access it, you can navigate to the service dashboard directly by selecting the created Tone Analyzer service from the list of services created in your account. The list of the services you have created can be found at <https://console.ng.bluemix.net/dashboard/apps>

7. In the service dashboard, click on the “Service Credentials” tab and go to service credentials section. Click on the “View Credentials” dropdown to view API Key and URL.
8. If Credentials do not exist, click the create “New Credentials” button.

Note: Copy the API KEY information and keep it handy as you will need it throughout this lab.



The screenshot shows the 'Service credentials' section of the Watson Tone Analyzer service dashboard. The sidebar shows 'Manage', 'Service credentials' (selected), 'Plan', and 'Connections'. The main area has a breadcrumb path 'Watson Services / Tone Analyzer / Tone Analyzer-m7'. It shows 'Resource Group: default' and 'Location: US South'. Under 'Service credentials', there's a table with one item. The table has columns for 'KEY NAME' (with a checkbox), 'DATE CREATED' (with the value 'OCT 31, 2018 - 03:56:44 PM'), and 'ACTIONS' (with a 'View credentials' button and a copy icon). The table also includes a dropdown for '10 Items per page' and a page indicator '1 of 1 pages'. Below the table, the JSON representation of the credentials is shown:

```

{
  "apikey": "021qk0duK9JTnzz7qZVtGzXFyRdFkBXcKIXnx22uvGTK",
  "iam_apikey_description": "Auto generated apikey during resource-key operation for Instance - crn:v1:bluemix:public:tone-analyzer:us-south:a/8bb17c14d3c5c17c33689a196b234189:3780fc9-6539-4b61-9d8a-7d94e5481338::",
  "iam_apikey_name": "auto-generated-apikey-e5ca7d30-365e-43ff-a23d-85fc36c32e0c",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Manager",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity:a/8bb17c14d3c5c17c33689a196b234189::serviceid:ServiceId-bfdfd962-224c-42bc-8b3e-81eb00755bf8",
  "url": "https://gateway.watsonplatform.net/tone-analyzer/api"
}

```

1.5 Creating Your Cloud Object Storage instance

1. Navigate to the IBM Cloud Catalog by clicking on Catalog in the top left-hand corner. Next select the Storage category from the category navigation. Alternatively, you can follow this link - <https://console.bluemix.net/catalog/?category=storage>

Watson Tone Analyzer Service

- Click on the Object Storage tile in the IBM Cloud catalog:

Catalog

The screenshot shows the IBM Cloud Catalog interface. On the left, there's a sidebar with 'All Categories' and a 'Storage' section expanded, showing various services like Compute, Containers, Networking, Storage, AI, Analytics, Databases, Developer Tools, Integration, Internet of Things, Security and Identity, Starter Kits, Web and Mobile, and Web and Application. The 'Storage' section is currently selected. In the main area, there are four service cards: 'Block Storage' (IBM), 'File Storage' (IBM), 'Object Storage' (Lite + IBM), and a 'Third Party' service for content management. The 'Object Storage' card is highlighted with a blue border.

- Within this window, do not make any changes to the Credential name or Service name. Create a trial service instance by selecting the Lite Plan option (default setting) and by clicking Create.

The screenshot shows the 'Cloud Object Storage' service page. At the top, it says 'Cloud Object Storage' and 'Lite + IBM'. Below that, there's a brief description: 'IBM Cloud Object Storage is a highly scalable cloud storage service, designed for high durability, resiliency and security. Store, manage and access your data via our self-service portal and RESTful APIs. Connect applications directly to Cloud Object Storage use other IBM Cloud Services with your data.' There are links for 'View Docs' and 'Terms'. On the right, there's a 'Compare Versions' button. The main form has fields for 'Service name:' (set to 'Cloud Object Storage-VP') and 'Select a resource group:' (set to 'wdp-bmtutor'). Below the form, there are sections for 'Features' (including 'Storage for the IBM Cloud', 'Storage Classes and Archive Policy', 'Built-in Aspera High Speed Transfer', and 'Access and Key Management'), 'Pricing Plans' (showing a table with one row for the 'Lite' plan), and a note that 'Monthly prices shown are for country or region: United States'. At the bottom, there are links for 'Need Help?', 'Contact IBM Cloud Support', 'Estimate Monthly Cost', and 'Cost Calculator', along with a 'Create' button.

- Click "Create Bucket" from the Setting up page

Watson Tone Analyzer Service

The screenshot shows the IBM Cloud interface with the Watson Tone Analyzer Service selected. On the left, a sidebar lists navigation options: Getting started (New), Setting up, Creating buckets, Access management, Buckets, Endpoint, Service credentials, Connections, Usage details, and Plan. Under 'Setting up', 'Creating buckets' is highlighted. The main content area displays the 'Cloud Object Storage' service page, which is described as an enterprise cloud object storage solution. It features a welcome message, a 'Learn More' button, a 'Create a bucket' section with a bucket icon, and an 'Access Management' section with a user icon. A 3D graphic of data storage layers is visible in the background.

5. Give bucket the name “toneanalyser”, choose the Resiliency level as well as the Location and click “Create bucket”.

The screenshot shows the 'Create bucket' dialog box within the Cloud Object Storage interface. The left sidebar shows the same navigation options as the previous screenshot. The dialog box has fields for 'Unique bucket name' (set to 'toneanalyser'), 'Resiliency' (set to 'Regional'), 'Location' (set to 'us-east'), and 'Storage class' (set to 'Standard'). There are also two optional checkboxes: 'Add Key Protect Keys' and 'Add archive policy'. A 'Create bucket' button is at the bottom right.

6. Upload the sample files via the “Upload” button or by Dragging and Dropping the files.

The screenshot shows the 'Objects' list for the 'toneanalyser2' bucket. The left sidebar shows the same navigation options. The main area displays a table with columns: Object Name, Archived, Size, and Last Modified. A placeholder message 'Drag and drop files or folders to upload them.' is visible in the list area. An 'Upload' button is located at the top right of the list area.

7. Click on the “Service Credentials” left-navigation option and note the following fields:

- a. apikey
- b. resource_instance_id

Watson Tone Analyzer Service

The screenshot shows the 'Service credentials' section of the Watson Tone Analyzer Service dashboard. On the left, there's a sidebar with options like 'Getting started', 'Buckets', 'Endpoint', 'Service credentials' (which is selected), 'Connections', 'Usage details', and 'Plan'. The main area has a header 'Dashboard / Cloud Object Storage-i8' and a 'Resource Group: default'. Below this, there's a 'Service credentials' section with a table showing one item: 'Service credentials-1' (Key Name), created on 'OCT 31, 2018 - 07:19:54 PM'. A 'View credentials' button is next to it. A large JSON snippet is displayed in a modal window, showing fields such as 'apikey', 'endpoints', 'iam_apikey_description', 'iam_apikey_name', 'iam_role_crn', 'iam_serviceid_crn', and various CRN values.

- Click on the “Endpoint” left-navigation option and note the endpoint for your “Resiliency” and “Location”

The screenshot shows the 'Endpoints' section of the Watson Tone Analyzer Service dashboard. The sidebar shows 'Endpoint' is selected. The main area has a header 'Dashboard / Cloud Object Storage-rg' and a 'Resource Group: wdp-bmtutor'. Below this, there's an 'Endpoints' section with a table titled 'Service endpoints'. It has two dropdown menus: 'Select resiliency: Regional' and 'Select location: us-east'. The table has two rows: 'Public' and 'Private'. Under 'Public', there's a row for 'us-east: s3.us-east.objectstorage.softlayer.net'. Under 'Private', there's a row for 'us-east: s3.us-east.objectstorage.service.networklayer.com'.

1.6 Creating Your Watson Studio instance

- Navigate to the IBM Cloud Catalog by clicking on Catalog in the top left-hand corner. Next select the AI category from the category navigation. Alternatively, you can follow this link - <https://console.bluemix.net/catalog/?category=ai>

Watson Tone Analyzer Service

2. Click on the Watson Studio tile in the IBM Cloud catalog:

All Categories Compute Containers Networking Storage AI > Analytics Databases Developer Tools Integration Internet of Things Security and Identity Starter Kits Web and Mobile Web and Application	<div style="display: flex; flex-wrap: wrap;"> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Watson Assistant (formerly Conversation) Lite • IBM Add a natural language interface to your application to automate interactions with your end users. Common applications include virtual agents and chat bots that </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  AI OpenScale Lite • IBM IBM AI OpenScale is an enterprise-grade environment for AI infused applications that provides enterprises with visibility into how AI is being built, used, and </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Compare Comply IBM • Beta Process governing documents to convert, identify, classify, and compare important elements </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Discovery Lite • IBM Add a cognitive search and content analytics engine to applications. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Knowledge Catalog Lite • IBM Discover, catalog, and securely share enterprise data. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Knowledge Studio Lite • IBM Teach Watson the language of your domain. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Language Translator Lite • IBM Translate text, documents, and websites from one language to another. Create industry or region-specific translations via the service's customization capability. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Machine Learning Lite • IBM IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Natural Language Classifier IBM Natural Language Classifier uses advanced natural language processing and machine learning techniques to create custom classification models. Users train </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Natural Language Understanding Lite • IBM Analyze text to extract meta-data from content such as concepts, entities, emotion, relations, sentiment and more. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Personality Insights Lite • IBM The Watson Personality Insights derives insights from transactional and social media data to identify psychological traits </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Speech to Text Lite • IBM Low-latency, streaming transcription </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Text to Speech Lite • IBM Synthesizes natural-sounding speech from text. </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Tone Analyzer Lite • IBM Tone Analyzer uses linguistic analysis to detect three types of tones from communications: emotion, social, and language. This insight can then be used to drive </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Visual Recognition Lite • IBM Find meaning in visual content! Analyze images for scenes, objects, faces, and other content. Choose a default model off the shelf, or create your own custom </div> </div> <div style="flex: 1; margin: 5px;"> <div style="border: 1px solid #ccc; padding: 5px; text-align: center;">  Watson Studio Lite • IBM Embed AI and machine learning into your business. Create custom models using your own data. </div> </div> </div>
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Within this window, do not make any changes to the Credential name or Service name. Create a trial service instance by selecting the Lite Plan option (default setting) and by clicking Create.

 Watson Studio Lite • IBM	<div style="margin-bottom: 10px;"> Service name: <input type="text" value="Watson Studio-vk"/> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Choose a region/location to deploy in: US South </div> <div style="width: 45%;"> Select a resource group: ? default </div> </div> <div style="margin-top: 10px;"> Features <ul style="list-style-type: none"> • Use what you know, learn what you don't Start from a tutorial, start from a sample, or start from scratch. Tap into the power of the best of open source (RStudio, Jupyter Notebooks) and Watson services for flexible model creation. Use Python, R, or Scala. Stop downloading and configuring analysis environments and start getting insights. • Be a founding member Take advantage of shared data sets, notebooks, models, and tutorials. Share your work with your team and your peers across job roles. Join a vibrant community of data scientists, developers, and domain experts across industries, functions, and organization types. • Power on demand Enterprise-scale features on demand. From data exploration and preparation, to enterprise-scale performance. Manage your data, your analytical assets, and your projects in a secured cloud environment. • Collaborate for better outcomes Work with your peers on projects to find better solutions together. Share your knowledge and your work easily with visualizations and code – and help fuel the advancement of data science and AI for all. </div>
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Watson Tone Analyzer Service

Images

Images can be screen captures, slides, or videos. Click an image to view the details.

Pricing Plans

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

PLAN	FEATURES	PRICING
Lite	1 authorized user 50 capacity unit-hours monthly limit 1 free small compute environment with 1 vCPU and 4 GB RAM (does not require capacity unit-hours)	Free
The Lite plan for Watson Studio offers everything you need to become a better data scientist or domain expert in a collaborative environment. Lite plan services are deleted after 30 days of inactivity.		
Standard v1	1 authorized user + unlimited viewer collaborators 50 capacity unit-hours included monthly (additional capacity available) Unlimited elastic compute environments Capacity Type: 1 vCPU and 4 GB RAM = 0.8 capacity units required per hour Capacity Type: 2 vCPU and 8 GB RAM = 1 capacity units required per hour Capacity Type: 3 vCPU and 12 GB RAM = 1.5 capacity units required per hour Capacity Type: 4 vCPU and 16 GB RAM = 2 capacity units required per hour Capacity Type: 8 vCPU and 32 GB RAM = 4 capacity units required per hour Capacity Type: 16 vCPU and 64 GB RAM = 8 capacity units required per hour Capacity Type: Data Refinery Flow, Sampling and Profiling jobs = 6 capacity units	\$105.00 CAD/Instance \$0.53 CAD/Capacity Unit-Hour \$105.00 CAD/Authorized User

[Estimate Monthly Cost](#) [Cost Calculator](#) [Create](#)

- Select “Tools” from Top Navigation. Select “Notebook” to create a Notebook.

The screenshot shows the top navigation bar of the IBM Watson Studio interface. The 'Tools' menu item is highlighted, and a dropdown menu is open, showing options like 'RStudio', 'Notebook', 'Modeler', and 'Data Refinery'. A tooltip for 'Notebook' provides a brief description: 'A notebook allows you to organize your resources to work with data and collaborate with team members'.

- Specify the name of the notebook and click Create Notebook.

Watson Tone Analyzer Service

New notebook

[Blank](#) [From file](#) [From URL](#)

Name*

ToneAnalyzer

38 Characters
Remaining

Description

Type your Description here

Language*

 Python 3.5Select runtime* Includes notebook environments [\(i\)](#)

Default Python 3.5 XS (2 vCPU and 8 GB RAM)

The selected runtime has 2 vCPU and 8 GB RAM and consumes 1 capacity unit per hour.

[Learn more](#) about capacity unit hours and Watson Studio pricing plans.

Project

CoreML_VP

[Cancel](#)[Create Notebook](#)

2 Tone Analyzer via API

The IBM Watson™ Tone Analyzer service uses linguistic analysis to detect emotional and language tones in written text. The service can analyze tone at both the document and sentence levels. You can use the service to understand how your written communications are perceived and then to improve the tone of your communications. Businesses can use the service to learn the tone of their customers' communications and to respond to each customer appropriately, or to understand and improve their customer conversations.

In this section of the lab we'll consume data stored in COS (Cloud Object Storage) for analysis with the Tone Analyzer service within Watson Studio. COS allows you to securely store production data and access it within Watson Studio for analysis. All objects stored in IBM® Cloud Object Storage are encrypted by default. If you want to encrypt the data using your own keys, you can manage them using IBM® Key Protect and use them to encrypt buckets.

2.1.1 Connect to the Tone Analyzer Service

REFERENCE: <https://www.ibm.com/watson/developercloud/tone-analyzer/api/v3/python.html?python#authentication>

Add the following Python code to your Watson Studio Notebook to establish a connection with the Tone Analyzer Service.

Python:

```
!pip install --upgrade "watson-developer-cloud>=2.2.6"
import json
from watson_developer_cloud import ToneAnalyzerV3

#Instantiate an instance of Tone Analyzer with API keys
tone_analyzer = ToneAnalyzerV3(
    version='2017-09-21',
    iam_apikey='{insert apikey for Tone Analyzer}'
)

#Instantiate an instance of Tone Analyzer with username
#password
#tone_analyzer = ToneAnalyzerV3(
#    version='2017-09-21',
#    username='{insert the username}',
#    password='{insert the password}',
#    url = "https://gateway.watsonplatform.net/tone-
#analyzer/api"
#)
```

2.1.2 Analyze Text with the General Model

REFERENCE: <https://www.ibm.com/watson/developercloud/tone-analyzer/api/v3/python.html?python#tone>

Use the general purpose endpoint to analyze the tone of your input content. The service analyzes the content for emotional and language tones. The method always analyzes the tone of the full document; by default, it also analyzes the tone of each individual sentence of the content.

You can submit no more than 128 KB of total input content and no more than 1000 individual sentences in JSON, plain text, or HTML format. The service analyzes the first 1000 sentences for document-level analysis and only the first 100 sentences for sentence-level analysis.

Let's analyze the tone of the following email:

'Team, I know that times are tough! Product sales have been disappointing for the past three quarters. We have a competitive product, but we need to do a better job of selling it!'

Add the following code to the Notebook and select Run from Command Panel.

```
#General Model
#Define the text to be analyzed
text = 'Team, I know that times are tough! Product sales have
been disappointing for the past three quarters. We have a
competitive product, but we need to do a better job of selling
it!'

#Call Tone Analyzer
tone_analysis = tone_analyzer.tone(
    {'text': text},
    'application/json'
).get_result()

#print the results
print(json.dumps(tone_analysis, indent=2))
```

```

File Edit View Insert Cell Kernel Help
Trusted | Python 3.5 O

In [24]: !pip install --upgrade "watson-developer-cloud>=2.2.6"
import json
from watson_developer_cloud import ToneAnalyzerV3

tone_analyzer = ToneAnalyzerV3(
    version='2017-09-21',
    iam_apikey='{api_key}')
)

#General Model
#Define the utterances
text = 'Team, I know that times are tough! Product sales have been disappointing for the past three quarters. We have a competitive product, but we need to do a better job of selling it!'

#Call Tone Analyzer
tone_analysis = tone_analyzer.tone(
    {'text': text},
    application/json
).get_result()

#print the results
print(json.dumps(tone_analysis, indent=2))

Requirement already up-to-date: watson-developer-cloud>=2.2.6 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages
Requirement not upgraded as not directly required: websocket-client==0.47.0 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: python-dateutil>=2.5.3 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: requests<3.0,>=2.0.0 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: six in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from websocket-client==0.47.0->watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: chardet<3.1.0,>=3.0.2 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from requests<3.0,>=2.0->watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: idna<2.7,>=2.5 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from requests<3.0,>=2.0->watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: urllib3<1.23,>=1.21.1 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from requests<3.0,>=2.0->watson-developer-cloud>=2.2.6)
Requirement not upgraded as not directly required: certifi>=2017.4.17 in /opt/conda/envs/DSX-Python35/lib/python3.5/site-packages (from requests<3.0,>=2.0->watson-developer-cloud>=2.2.6)

{
    "sentences_tone": [
        {
            "tones": [
                {
                    "tone_id": "analytical",
                    "tone_name": "Analytical",
                    "score": 0.801827
                }
            ],
        },
    ],
}

```

2.1.3 Interpreting results

The service returns the tone for each of the 3 sentences as well as the overall tone of the document.

Note: The score that is returned represents the likelihood that the tone is perceived and not the degree to which the tone is perceived, the tone range is 0.5 to 1. A score greater than 0.75 indicates a high likelihood that the tone is perceived in the content.

The service returns **emotional** and **language** tones. The list of possible returned tones is:

- Emotional tones
 - anger
 - fear
 - joy
 - sadness
- Language Tones
 - analytical
 - confident
 - tentative

```
{
    "sentences_tone": [
        {
            "tones": [

```

```
{  
    "tone_id": "analytical",  
    "tone_name": "Analytical",  
    "score": 0.801827  
},  
],  
"text": "Team, I know that times are tough!",  
"sentence_id": 0  
},  
{  
    "tones": [  
        {  
            "tone_id": "sadness",  
            "tone_name": "Sadness",  
            "score": 0.771241  
        },  
        {  
            "tone_id": "analytical",  
            "tone_name": "Analytical",  
            "score": 0.687768  
        }  
    ],  
    "text": "Product sales have been disappointing for the  
past three quarters.",  
    "sentence_id": 1  
},  
{  
    "tones": [  
        {  
            "tone_id": "analytical",  
            "tone_name": "Analytical",  
            "score": 0.506763  
        }  
    ],  
    "text": "We have a competitive product, but we need to  
do a better job of selling it!",  
    "sentence_id": 2  
}  
],  
"document_tone": {  
    "tones": [  
        {  
            "tone_id": "sadness",  
            "tone_name": "Sadness",  
            "score": 0.6165  
        },  
        {  
            "tone_id": "analytical",  
            "tone_name": "Analytical",  
            "score": 0.829888  
        }  
    ]  
}
```

```
    ]  
}  
}
```

2.1.4 Analyze Text with the Customer Engagement Model

Use the customer engagement endpoint to analyze the tone of customer service and customer support conversations. For each utterance of a conversation, the method reports the most prevalent subset of the following seven tones: sad, frustrated, satisfied, excited, polite, impolite, and sympathetic.

If you submit more than 50 utterances, the service returns a warning for the overall content and analyzes only the first 50 utterances. If you submit a single utterance that contains more than 500 characters, the service returns an error for that utterance and does not analyze the utterance. The request fails if all utterances have more than 500 characters. Per the JSON specification, the default character encoding for JSON content is effectively always UTF-8.

Add the following code to the Notebook and select Run from Command Panel.

```
#Customer Service Example  
#Define the utterances  
utterances = [  
    {  
        "text": "Hello, I'm having a problem with your  
product.",  
        "user": "customer"  
    },  
    {  
        "text": "OK, let me know what's going on, please.",  
        "user": "agent"  
    },  
    {  
        "text": "Well, nothing is working :(",  
        "user": "customer"  
    },  
    {  
        "text": "Sorry to hear that.",  
        "user": "agent"  
    }  
]  
  
#Call Tone Analyzer  
utterance_analyses =  
tone_analyzer.tone_chat(utterances).get_result()  
  
#Print the results  
print(json.dumps(utterance_analyses, indent=2))
```

2.1.5 Interpreting results

The service returns the tone for each utterance of the input. The list of possible returned tones is:

- excited
- frustrated
- impolite
- polite
- sad
- satisfied
- sympathetic

Note: The score that is returned represents the likelihood that the tone is perceived and not the degree to which the tone is perceived, the tone range is 0.5 to 1. A score greater than 0.75 indicates a high likelihood that the tone is perceived in the content.

```
{
  "utterances_tone": [
    {
      "utterance_id": 0,
      "tones": [
        {
          "tone_id": "polite",
          "tone_name": "Polite",
          "score": 0.686361
        }
      ],
      "utterance_text": "Hello, I'm having a problem with your product."
    },
    {
      "utterance_id": 1,
      "tones": [
        {
          "tone_id": "polite",
          "tone_name": "Polite",
          "score": 0.92724
        }
      ],
      "utterance_text": "OK, let me know what's going on, please."
    },
    {
      "utterance_id": 2,
      "tones": [
        {
          "tone_id": "sympathetic",
          "tone_name": "Sympathetic",
          "score": 0.99824
        }
      ],
      "utterance_text": "I'm sorry to hear that. Can you tell me more about it?"
    }
  ]
}
```

```
"utterance_id": 2,
"tones": [
  {
    "tone_id": "sad",
    "tone_name": "Sad",
    "score": 0.997795
  }
],
"utterance_text": "Well, nothing is working :("
},
{
  "utterance_id": 3,
  "tones": [
    {
      "tone_id": "polite",
      "tone_name": "Polite",
      "score": 0.730982
    },
    {
      "tone_id": "sympathetic",
      "tone_name": "Sympathetic",
      "score": 0.672499
    }
  ],
  "utterance_text": "Sorry to hear that."
}
]
```

2.1.6 Connect to Cloud Object Storage

In this section we'll connect to the Cloud Object Storage and retrieve the documents that we uploaded to our bucket. Once we retrieve the files, we'll read the contents of the file and analyze it with Tone Analyzer. Add the following code in a new cell and specify the apikey, resource_instance_id and service_endpoint noted down in the previous section. Select Run from Command Panel.

```
# provide COS Authentication and verify access
!pip install -U ibm-cos-sdk
import ibm_boto3
from ibm_botocore.client import Config

cos_credentials = {
  "apikey": "{insert the apikey}",
  "resource_instance_id": "{insert the resource instance id}"
}
service_endpoint = 'https://s3-api.us-
geo.objectstorage.softlayer.net'
auth_endpoint = 'https://iam.bluemix.net/oidc/token'
```

```
cos = ibm_boto3.resource('s3',
    ibm_api_key_id=cos_credentials['apikey'],
    ibm_service_instance_id=cos_credentials['resource_instance_id'],
    ibm_auth_endpoint=auth_endpoint,
    config=Config(signature_version='oauth'),
    endpoint_url=service_endpoint)

# Print all buckets in COS
for bucket in cos.buckets.all():
    print("bucket: ", bucket)
```

2.1.7 Interpreting results

If a successful connection is established, the system will return the list buckets that exist with Cloud Object Storage.

```
bucket: s3.Bucket(name='toneanalyzer')
```

2.1.8 Connect to COS, read the files and analyze with Tone Analyzer

In this section, we'll retrieve the files uploaded to COS and analyze them with Tone Analyzer

```
# Analyze the files within COS
bucket_name = "toneanalyzer"
filetype = ".txt"

bucket_obj = cos.Bucket(bucket_name)
for file_object in bucket_obj.objects.all():
    if (file_object.key.endswith(filetype)):
        file = cos.Object(bucket_name, file_object.key).get()
        filecontent = str(file["Body"].read())

        #Call Tone Analyzer
        tone_analysis = tone_analyzer.tone(
            {'text': filecontent},
            'application/json'
        ).get_result()

        #Print the results
        print(json.dumps(tone_analysis, indent=2))
```

2.1.9 Interpreting results

Analyze the results returned by the Tone Analyzer service.

```
{  
  "sentences_tone": [  
    {  
      "tones": [  
        {  
          "tone_id": "analytical",  
          "tone_name": "Analytical",  
          "score": 0.801827  
        }  
      ],  
      "text": "b'Team, I know that times are tough!",  
      "sentence_id": 0  
    },  
    {  
      "tones": [  
        {  
          "tone_id": "sadness",  
          "tone_name": "Sadness",  
          "score": 0.771241  
        },  
        {  
          "tone_id": "analytical",  
          "tone_name": "Analytical",  
          "score": 0.687768  
        }  
      ],  
      "text": "Product sales have been disappointing for the  
past three quarters.",  
      "sentence_id": 1  
    },  
    {  
      "tones": [  
        {  
          "tone_id": "analytical",  
          "tone_name": "Analytical",  
          "score": 0.506763  
        }  
      ],  
      "text": "We have a competitive product, but we need to  
do a better job of selling it!'",  
      "sentence_id": 2  
    }  
  ],  
  "document_tone": {  
    "tones": [  
      {  
        "tone_id": "sadness",  
        "tone_name": "Sadness",  
        "score": 0.6165  
      },  
      {  
        "tone_id": "analytical",  
        "tone_name": "Analytical",  
        "score": 0.383455  
      }  
    ]  
  }  
}
```

```
        "tone_id": "analytical",
        "tone_name": "Analytical",
        "score": 0.829888
    }
]
}
}
```

2.1.10 Summary

Cloud object provides a secure space to upload documents that need to be consumed and analyzed by other Watson services, such as Tone Analyzer. A powerful use case is using Tone Analyzer to monitor help center conversations to analyze the effectiveness of a customer service agent. Tone Analyzer can also be deployed to monitor Twitter and other platform on user's sentiments related to different products.

3 Combine Tone Analyzer within Watson Assistant via a Cloud Functions

3.1.1 Create a Cloud Function

1. Navigate to the IBM Cloud Catalog by clicking on Catalog in the top left-hand corner. Next enter “Cloud Functions” and click Filter.
2. Click on the Functions tile in the IBM Cloud catalog:

Catalog

All Categories (1) > Compute Serverless Compute

Functions IBM

IBM Cloud Functions is a Function-as-a-Service (FaaS) platform which executes functions in response to incoming events.

3. Click on “Start Creating”.

Note: If a warning message is displayed indicating that a space needs to be provisioned, follow the instructions to create a space.

Getting Started with IBM Cloud Functions

IBM Cloud Functions (based on Apache OpenWhisk) is a Function-as-a-Service (FaaS) platform which executes functions in response to incoming events and costs nothing when not in use. Learn More

Start Creating Download CLI

What's New:

- Updated Action runtimes: NodeJS 8, Swift 4
- Get started quickly with Templates: Try it now
- New logging service integration (see the Logs link in the left navigation)
- Compliance: New ISO certifications (ISO 27001, ISO 27017, ISO 27018)
- Available in new datacenter: Frankfurt, Germany (see the Region selector)
- Increased maximum execution time for Actions: 10 minutes

4. Click on “Create Action”

Create

**Quickstart Templates**

Get started quickly using one of the Templates. A number of use cases are available, from a hello world action to invoking functions from Cloudant or Message Hub events.

**Create Action**

Actions contain your function code and are invoked by events or REST API calls.

**Create Sequence**

Sequences invoke Actions in a linear order, passing parameters from one to the next.

**Create Trigger**

Triggers receive events from outside IBM Cloud Functions and invoke all connected Actions.

**Install Packages**

Installing Packages installs reusable Actions into your namespace.

- Provide a name for the action in the “Action Name” field and select the runtime as Python 3.

Create Action

Actions contain your function code and are invoked by events or REST API calls.

Action Name

CloudFunction

[Learn more about Actions](#)[Learn more about Packages](#)**Enclosing Package**

(Default Package)

[Create Package](#)**Runtime**

Python 3

Looking for Java or Docker? [Java](#) and [Docker](#) Actions can be created with the [CLI](#)

- A new cloud function is created.

Code Python 3.6.4

Edit mode - press ESC to exit

[Change Input](#) [Invoke](#)

```

1 #
2 #
3 # main() will be run when you invoke this action
4 #
5 # @param Cloud Functions actions accept a single parameter, which must be a JSON object.
6 #
7 # @return The output of this action, which must be a JSON object.
8 #
9 #
10 import sys
11
12 def main(dict):
13     return { 'message': 'Hello world' }
14

```

- Insert the following code snippet that will take the input that is sent to the cloud function and send it to Tone Analyzer for processing and return the first tone identified by the cloud function. This code is almost identical to the code from the first part of the lab.

```

#
#
# main() will be run when you invoke this action
#
# @param Cloud Functions actions accept a single parameter,
# which must be a JSON object.
#
# @return The output of this action, which must be a JSON

```

```

object.
#
#
import sys
import json
from watson_developer_cloud import ToneAnalyzerV3

#tone_analyzer = ToneAnalyzerV3(
#    version='2017-09-21',
#    iam_apikey='{apikey}'
#)

def main(dict):
    input = dict["text"]

    #Customer Service Example
    #Define the utterances
    utterances = [
        {
            "text": input
        }
    ]

    #Call Tone Analyzer
    utterance_analyses = tone_analyzer.tone_chat(utterances)

    print
(utterance_analyses["utterances_tone"][0]["tones"][0]["tone_id"])

    # Select the first tone returned by the service
    first_tone =
utterance_analyses["utterances_tone"][0]["tones"][0]["tone_id"]
]
    return {"tone": first_tone}

```

8. Let's add a parameter to test the cloud function. Click on "Parameters" on the left-navigation and add the following parameter:

- Parameter Name: text
- Parameter Value: "I am very upset!"

The screenshot shows the Watson Tone Analyzer service interface. On the left, there is a navigation bar with tabs for 'Code', 'Parameters' (which is currently selected), 'Runtime', 'Endpoints', and 'Connected Triggers'. The main area is titled 'Parameters' and contains a table with one row. The table has two columns: 'Parameter Name' and 'Parameter Value'. The 'Parameter Name' column contains the value 'text', and the 'Parameter Value' column contains the value '"I am very upset!"'. There is also a small trash can icon next to the 'Parameter Value' cell.

Watson Tone Analyzer Service

9. Click on “Code” in the left-navigation and click on “Invoke” in the top-right section of the page. The result of the Cloud Function is displayed.

The screenshot shows the Watson Tone Analyzer Service Cloud Functions interface. On the left, the 'Code' tab is selected, displaying Python 3.6.4 code for a cloud function named 'ToneAnalyzer'. The code imports sys and json, and uses the Watson Developer Cloud ToneAnalyzerV3 API to analyze text. On the right, the 'Activations' tab is selected, showing a single activation record. The activation ID is 519a5da23d8346bc9a5da23d8346bc18, it took 195 ms, and it occurred on 10/31/2018, 21:36:26. The results show a single tone: 'frustrated'. The logs indicate the output was 'frustrated'.

10. Navigate to the “Endpoints” on the left-navigation and note the “URL” under the “REST API” section.

The screenshot shows the 'Endpoints' configuration for the Watson Tone Analyzer service. Under the 'Web Action' section, 'Enable as Web Action' is checked, and 'Raw HTTP handling' is unchecked. In the 'REST API' section, the 'HTTP METHOD' is set to 'POST', 'AUTH' is 'API KEY', and the 'URL' is https://openwhisk.ng.bluemix.net/api/v1/namespaces/bmtutor%40us.ibm.com_KPMG/actions/ToneAnalyzer. Below this, a 'curl' command is provided for making requests: curl -u API-KEY -X POST https://openwhisk.ng.bluemix.net/api/v1/namespaces/bmtutor%40us.ibm.com_KPMG/actions/ToneAnalyzer?blocking=true.

11. Click on “API-KEY” and record the “KEY” on the next page.

The screenshot shows the 'API Key' management interface. It states that the REST API is protected with an API Key, and each namespace has a unique API key assigned. The current namespace is bmtutor@us.ibm.com_KPMG, the host is openwhisk.ng.bluemix.net, and the API key is displayed as a series of dots (.....). A 'Start Creating' button is visible in the top right corner.

Watson Tone Analyzer Service

3.1.2 Create the Watson Asistance service

Now let's setup the integration with the Watson Assistant service.

1. Navigate to the IBM Cloud Catalog by clicking on Catalog in the top left-hand corner. Next select the AI category from the category navigation. Alternatively, you can follow this link - <https://console.bluemix.net/catalog/?category=ai>
2. Click on the Waston Assistant tile in the IBM Cloud catalog:

The screenshot shows the IBM Cloud Catalog interface. On the left, a sidebar lists categories under 'AI', with 'Watson Assistant (formerly Conversation)' highlighted. The main area displays a grid of AI services. The 'Watson Assistant (formerly Conversation)' service is the first in the top row, featuring a speech bubble icon and a brief description: 'Add a natural language interface to your application to automate interactions with your end users. Common applications include virtual agents and chat bots that can integrate and communicate on any channel or device.' Other visible services include AI OpenScale, Compare Comply, Discovery, Knowledge Catalog, Knowledge Studio, Language Translator, Machine Learning, Natural Language Classifier, Natural Language Understanding, Personality Insights, Speech to Text, Text to Speech, Tone Analyzer, Visual Recognition, and Watson Studio.

Within this window, do not make any changes to the Credential name or Service name. Create a trial service instance by selecting the Lite Plan option (default setting) and by clicking Create.

The screenshot shows the 'Watson Assistant (formerly Conversation)' service creation page. It includes fields for 'Service name' (set to 'Watson Assistant (formerly Conversation)-8v'), 'Choose a region/location to deploy in' (set to 'US South'), and 'Select a resource group' (set to 'Default'). Below these are sections for 'View Docs', 'Terms', 'AUTHOR' (IBM), 'PUBLISHED' (10/30/2018), 'TYPE' (Service), 'Images' (with three screenshots of the service interface), 'Pricing Plans' (showing a single 'Lite' plan with 10,000 API calls per month, up to 5 Workspaces, and up to 100 Intents, marked as 'Free'), and a 'Create' button at the bottom right. At the very bottom, there are links for 'Need Help?', 'Contact IBM Cloud Support', 'Estimate Monthly Cost', and 'Cost Calculator'.

3. Click on “Launch Tool”

Watson Tone Analyzer Service

The screenshot shows the Watson Tone Analyzer Service interface. On the left, a sidebar has options: Manage, Service credentials, Plan, and Connections. The main area shows "Watson Services / Assistant / Watson Assistant (formerly Conversation)-VP_Test". It indicates a Resource Group: Default and Location: US South. A message says "Get started by launching the tool." with buttons for "Launch tool", "Getting started tutorial", and "API reference". Below this is a "Credentials" section with fields for "API Key" (redacted) and "Url" (<https://gateway.watsonplatform.net/assistant/api>). A "Plan: Lite" button with "Upgrade" is also present.

4. Click on “Workspaces” in the top-level navigation

The screenshot shows the IBM Watson Assistant interface. The top bar says "IBM Watson Assistant". The navigation bar has "Home" and "Workspaces". The main content area features a large "Introducing IBM Watson Assistant" heading. Below it, a sub-headline says "Watson Conversation is evolving to simplify how you build and scale virtual assistants." with a link "See what's new".

5. Click on “Create”

The screenshot shows the "Workspaces" creation interface. The top navigation bar has "Home" and "Workspaces". The main area has a "Workspaces" heading with an upward arrow icon. On the left, a dashed box contains instructions: "Create a new workspace" and "Workspaces enable you to maintain separate intents, user examples, entities, and dialogs for each use or application.". It also states "You are using 0 of 5 available workspaces in this instance." with a "Create" button and a plus sign icon. On the right, a dark blue box shows a workspace named "Customer Service - Sample" with a description "A virtual assistant for customer service sample", language "English (U.S.)", and an "Edit sample" button.

6. Enter the name for the workspace and click “Create”.

Create a workspace

Workspaces enable you to maintain separate intents, user examples, entities, and dialogs for each use or application.

Name

ToneAnalyzerDemo

Description

Language

English (U.S.)

Create

7. Click on “Dialog” in the top-left navigation and click “Create”

[Workspaces](#) / ToneAnalyzerDemo / Build

Intents Entities **Dialog** Content Catalog



No dialog yet

A dialog uses intents, entities, and context from your application to define a response to each user's input. Creating a dialog defines how your virtual assistant will respond to what your users are saying.

Create 

8. Click on the “Welcome” to select it. Click on “Add child node”.

Intents Entities **Dialog** Content Catalog

The screenshot shows the Watson Tone Analyzer Service interface under the 'Dialog' tab. At the top, there are buttons for 'Add node' (blue), 'Add child node' (grey), 'Add folder' (grey), and 'Settings' (blue gear icon). Below these are two nodes in a tree structure:

- Welcome**: welcome
1 Response / 0 Context set / Does not return
- Anything else**: anything_else
1 Response / 0 Context set / Does not return

- Enter “true” in the “If bot recognizes” field to ensure that the node is always executed. Click on the “Options” icon and select “Open JSON Editor”

The screenshot shows the same dialog interface with the 'true' node expanded. The 'true' node has the following configuration:

- Name this node...**
- If bot recognizes:** true
- Then respond with:**
 - Type:** Text
 - Enter response text:** (empty)
 - Response variations are set to sequential.** Set to random | multiline

A context menu is open over the 'Text' type dropdown, showing options: 'Open JSON editor' and 'Open context editor'.

- Enter the following information to establish a connection to the cloud function and send the user input to the Cloud Function for processing.

Note: Replace the name value with the corresponding URL value copied in the previous section. Make sure to replace “%40” with the “@” symbol and only keep the data after the “namespaces” part of the URL.

The following bit of code will invoke the Cloud Function we created in the previous section and send the text entered by the user to the Cloud Function, which in turn will send it to Tone Analyzer. The credentials to connect to the Cloud Function would typically be injected by the Service Orchestrator into the private.my_credentials context variable. A context variable that starts with “private” will not be logged by the Watson Assistant service. The result returned by the Cloud Function will be stored within the “my_result” context variable.

```
{  
  "output": {  
    "text": {  
      "values": [],  
      "selection_policy": "sequential"  
    }  
  },  
  "actions": [  
    {  
      "name": "/bmtutor@us.ibm.com_KPMG/actions/ToneAnalyzer",  
      "type": "cloud_function",  
      "parameters": {  
        "text": "<?input_text?>"  
      },  
      "credentials": "$private.my_credentials",  
      "result_variable": "$my_result"  
    }  
  ]  
}
```

11. In Dialog select the “true” node and click “Add Child Node”. Enter the condition “\$my_result.tone =='frustrated'” and the answer “I am sorry you are frustrated”.

The above condition examines the “my_result” context variable which would contain the result returned by the Cloud Function and if the value is equal to “frustrated”, then the answer will be presented to the user.

Watson Tone Analyzer Service

Intents Entities **Dialog** Content Catalog

The screenshot shows the Watson Tone Analyzer Service Dialog interface. On the left, a tree view of nodes under 'ToneAnalyzerDemo' includes 'Welcome' (with condition '\$my_result.tone ==> frustrated'), 'true' (with response 'I am sorry you are frustrated!'), and 'Anything else'. On the right, configuration for the 'true' node is shown:

- Name this node...**: (empty)
- If bot recognizes:** \$my_result.tone ==> frustrated
- Then respond with:** Text: I am sorry you are frustrated!
- Response variations are set to sequential.** Set to random | multiline ⓘ
- + Add response type**

12. Click on the true node and modify the “Finally” condition at the bottom of the page to the value “Skip user input and evaluate child nodes”.

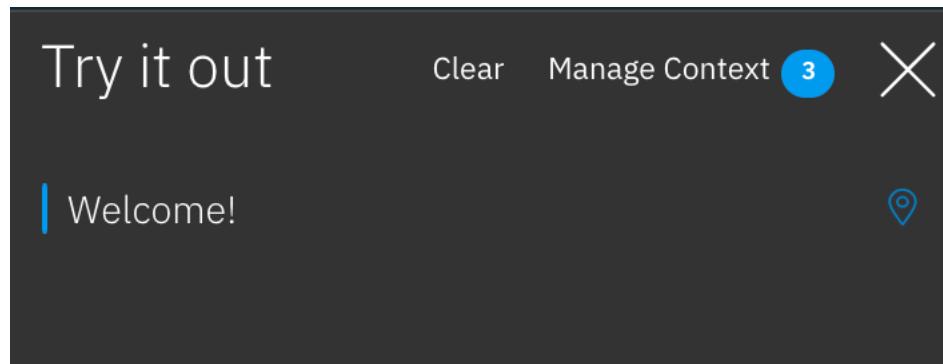
The screenshot shows the Watson Tone Analyzer Service Dialog interface after modifying the 'true' node. The 'true' node now has a 'Finally' condition set to 'Skip user input. The fi'. The configuration for the 'true' node is updated as follows:

- If bot recognizes:** true
- Then respond with:** Text: Enter response text
- Response variations are set to sequential.** Set to random | multiline ⓘ
- + Add response type**
- And finally**: Skip user input and evaluate child nodes

13. Click on the “Try it” button in the top-right of the Dialog page.

The screenshot shows the Watson Tone Analyzer Service interface. At the top, there's a navigation bar with 'Workspaces / ToneAnalyzerDemo / Build'. On the right, there are search and 'Try it' buttons. Below the navigation is a toolbar with 'Intents', 'Entities', 'Dialog' (which is underlined), and 'Content Catalog'. Underneath the toolbar are buttons for 'Add node', 'Add child node', 'Add folder', and 'Settings'. A message box at the bottom says 'ToneAnalyzerDemo'.

14. Click on “Manage Context” in the top right of the Try it Out panel.



15. As we do not have an integration with a Service Orchestrator, we'll simulate the credentials being passed via the context variable by adding them directly into the context.

Enter “private” as the variable name.

Context variables ⓘ

\$private

16. Enter the following value for the “private” variable, replace “[api key]” with the API KEY copied for the Cloud Function in the previous section.

```
private
{"my_credentials":{"api_key":"[api key]"}}
```

\$private

```
{"my_credentials":{"api_key":"16af3973-c65"}}
```

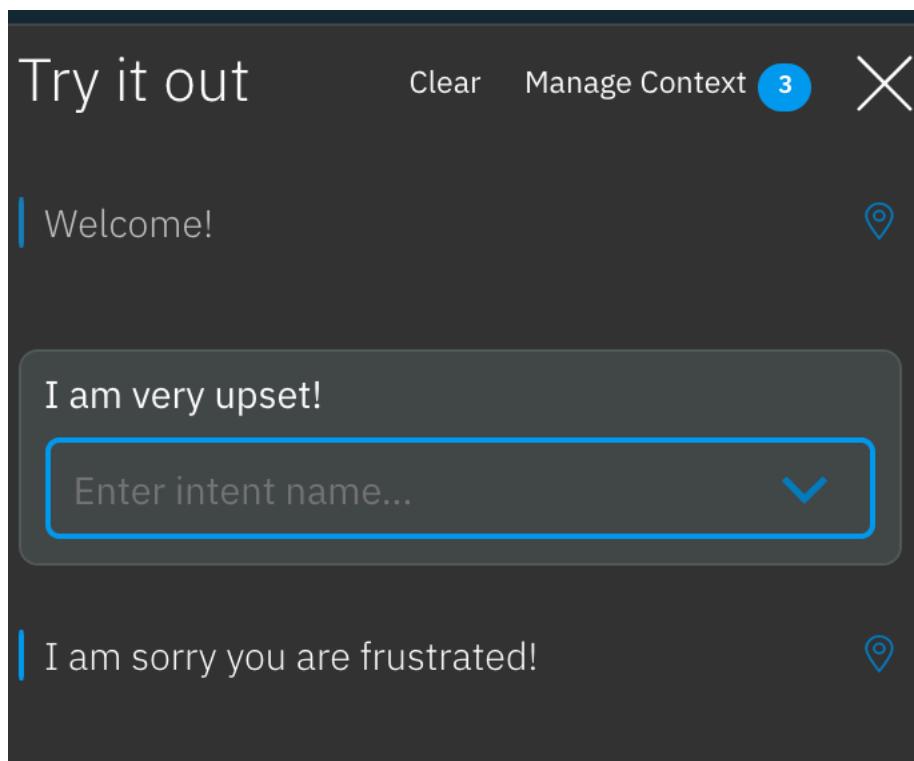
17. Close the “Context Variables” section by click the “X” in the top right of the panel. Enter “I am very upset!” in the “Try It Out” panel.

Try it out Clear Manage Context (3) X

Welcome! 

I am very upset!

18. The system wil return the answer “I am sorry you are frustrated!”



19. We can verify the information returned by the Cloud Function by clicking on the “Manage Context” link in the top-right of the “Try It Out” panel and examining the “my_result” context variable.

Context variables ⓘ



\$Enter variable name

\$timezone



"America/Vancouver"

\$my_result



{"tone":"frustrated"}

\$private



{"my_credentials":{"api_key":"16af3973-c65

20. Add additional Dialog logic and try different examples to extend the prototype!

4 Data collection

By default, all Watson services log requests and their results. Logging is done only to improve the services for future users. The logged data is not shared or made public. To prevent IBM from accessing your data for general service improvements, set the X-watson-Learning-Opt-Out header parameter to true when you instantiate the service. (Any value other than false or 0 disables request logging for that call.) You must set the header when you create the service for any call that you do not want IBM to access for general service improvements.

Python:

```
from watson_developer_cloud import ToneAnalyzerV3

tone_analyzer = ToneAnalyzerV3(
    version='2017-09-21',
    iam_apikey='{api_key}'
)

#Opt out of learning
tone_analyzer.set_default_headers({'x-watson-learning-opt-
out': "true"})
```

5 Error Handling

The Tone Analyzer service uses standard HTTP response codes to display whether a method completed successfully. A 200 response always indicates success. A 400 type response is some sort of failure, and a 500 type response usually indicates an internal system error.

STATUS	DESCRIPTION
200 - OK	OK. The request succeeded. If the input is partially correct, the response can include warning or error fields with appropriate messages.
400 - BAD REQUEST	A required input parameter is null or a specified input parameter or header value is invalid or not supported. The response is also returned if all utterances of the input have more than 500 characters.
401 - UNAUTHORIZED	Access is denied due to invalid service credentials.
404 - NOT FOUND	The requested item or parameter doesn't exist.
429 – TOO MANY REQUESTS	The service is throttling your request because your IBM Cloud ID submitted more than 1200 requests per minute.
500 - SERVER ERRORS	Internal server error.

6 References

- The science behind the service: <https://console.bluemix.net/docs/services/tone-analyzer/science.html#the-science-behind-the-service>
- Tone Analyzer Sample Applications:
 - General Model: <https://tone-analyzer-demo.ng.bluemix.net/>
 - Customer Engagement: <https://customer-engagement-demo.ng.bluemix.net/>
- API Reference: <https://www.ibm.com/watson/developercloud/tone-analyzer/api/v3/>
- Tone Analyzer Documentation: <https://console.bluemix.net/docs/services/tone-analyzer/getting-started.html#gettingStarted>