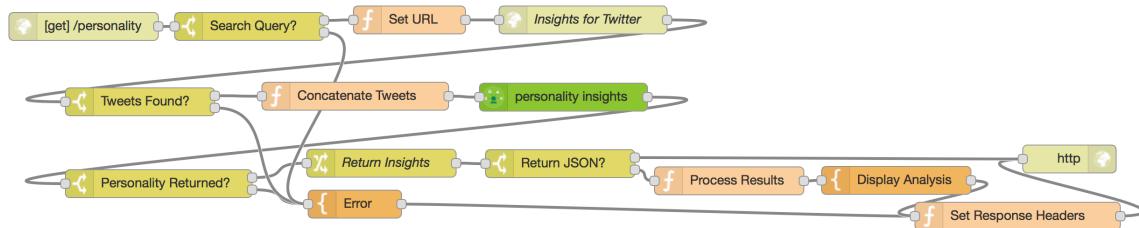
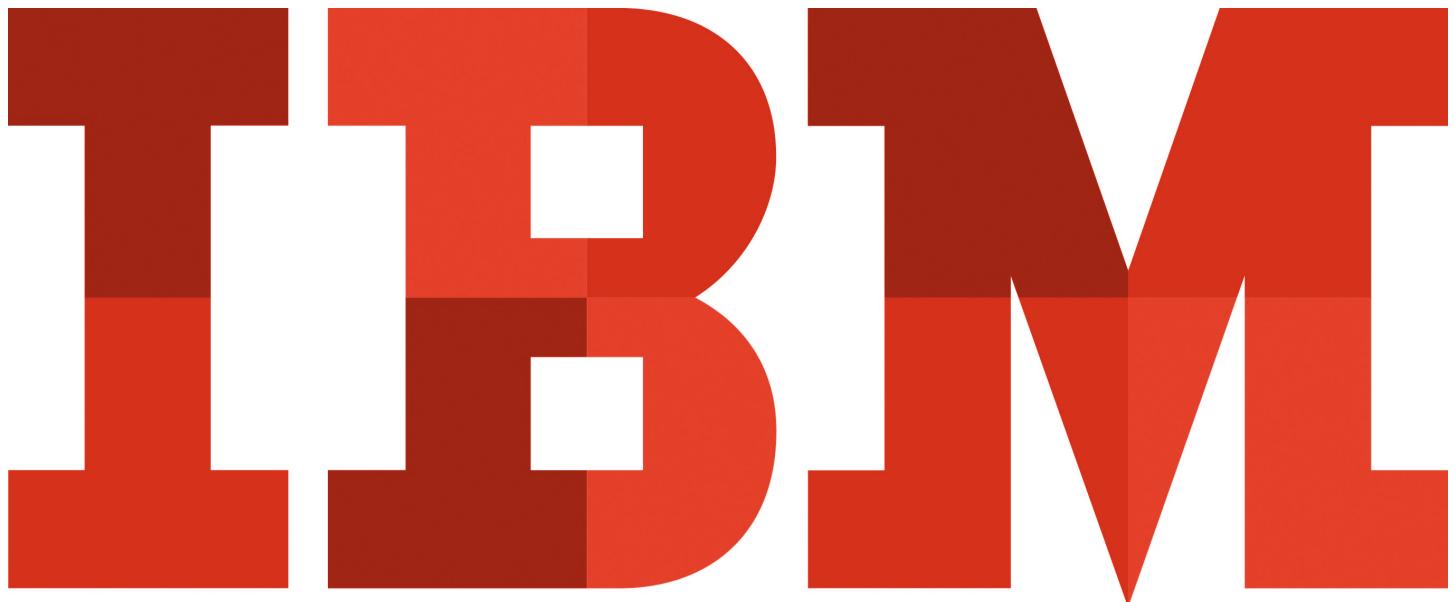


Analyzing Twitter User's Personality in Node-RED

Hands-On Lab

JeanCarl Bisson | jbisson@us.ibm.com | [@dothewww](https://twitter.com/dothewww)



Search tweets from Twitter and gain insights using IBM Watsons Personality Insights



A digital copy of this lab and code snippets can be found at:
<http://ibm.biz/node-red-twitter-personality>

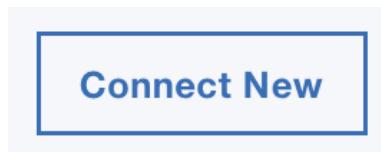


Add Insights for Twitter service in IBM Bluemix

In this lab, we'll create a Node-RED application that searches Twitter for tweets using the Insights for Twitter Bluemix service, and then use the IBM Watson Personality Insights service to gain insight into how and why people think, act, and feel the way they do.

Our first step is to add the Insights for Twitter service and connect it to the Node-RED application.

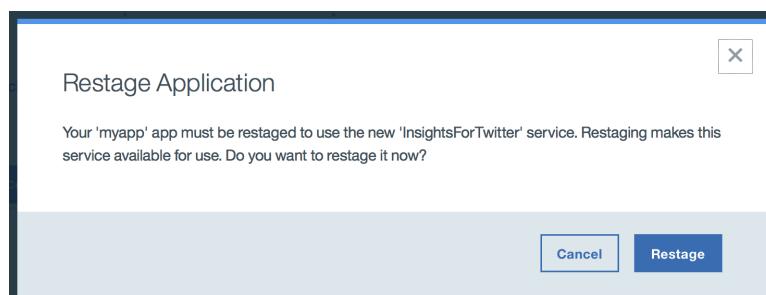
1. Go to the Connections tab under the application overview for your Node-RED application in the IBM Bluemix dashboard and click on **Connect New**.



2. Click on the **Insights for Twitter** tile under the Data & Analytics section. Click on **Create**.

The screenshot shows the IBM Bluemix Connections page. On the left, there's a sidebar with categories like All Categories, Infrastructure, Apps, and Services. Under Services, the 'Data & Analytics' category is selected and expanded, showing various services. One service, 'Insights for Twitter', is highlighted with a light purple background. Other visible services include IBM DB2 on Cloud, IBM Graph, IBM Master Data Management on Cloud, IBM Watson Machine Learning, Information Server on Cloud, Informix on Cloud, Lift, Streaming Analytics, Weather Company Data, ClearDB MySQL Database, Cupenya Insights, ElephantSQL, Namara.io Catalog, Redis Cloud, and TinyQueries. Each service has a brief description and an IBM logo.

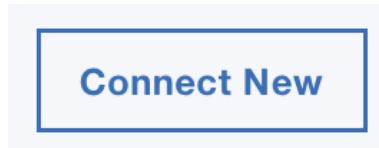
3. IBM Bluemix will prompt to restage the application. Click on **Restage**. The application will restart and include the new service credentials in the environment.



Add Personality Insights service in IBM Bluemix

Next, let's add IBM Watson Personality Insights service and connect it to the Node-RED application.

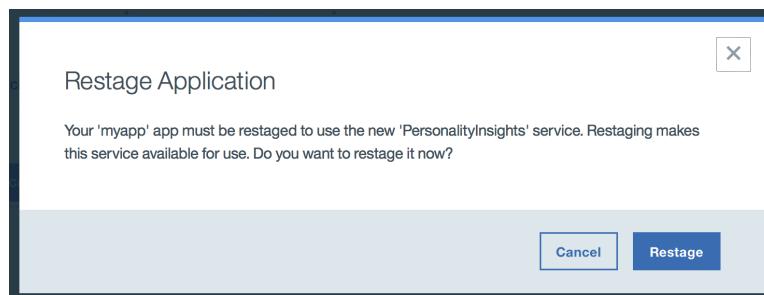
1. Go to the Connections tab under the application overview for your Node-RED application in the IBM Bluemix dashboard and click on **Connect New**.



2. Click on the **Personality Insights** tile under the Watson section. Click on **Create**.

The screenshot shows the IBM Bluemix Connections page. On the left, there's a sidebar with categories like All Categories, Infrastructure, Apps, and Services. Under Services, the 'Watson' category is selected, which contains several services: AlchemyAPI, Conversation, Discovery, Document Conversion, Language Translator, Natural Language Classifier, Personality Insights, Retrieve and Rank, Speech to Text, Text to Speech, Tone Analyzer, Tradeoff Analytics, Visual Recognition, Cognitive Commerce™, and Cognitive Graph. The 'Personality Insights' tile is highlighted with a light purple background and has a 'Create' button next to it. A search bar and a 'Filter' button are at the top right.

3. IBM Bluemix will prompt to restage the application. Click on **Restage**. The application will restart and include the new service credentials in the environment.

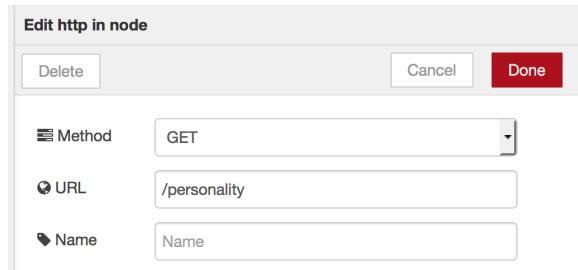


4. When the application has finished restaging, open the Node-RED Flow Editor. If you already have Node-RED open, refresh the page.

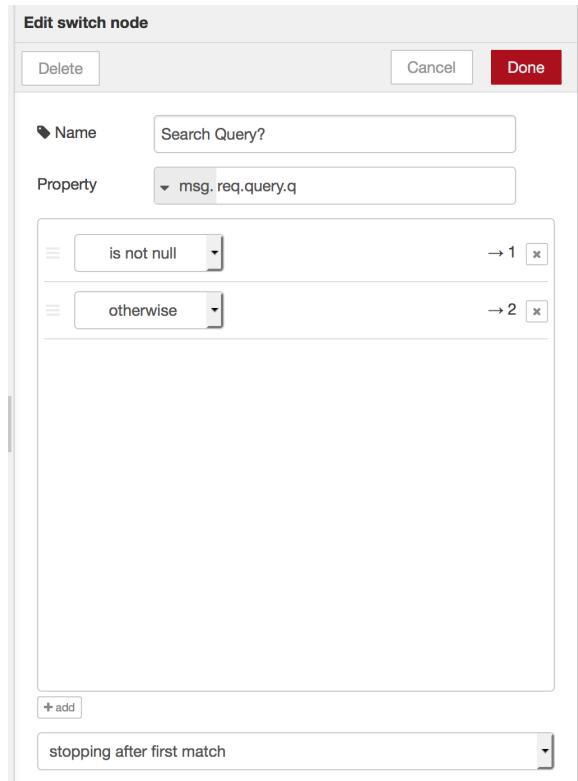
Retrieve and Analyze Tweets

In this section, we will create a web URL endpoint that takes in a search query in the URL; use the Insights for Twitter service to search for tweets matching this criteria; concatenate the matching tweets together; use the IBM Watson Personality Insights service to gain insight into how and why people think, act, and feel the way they do; and then return the results in JSON and HTML formats.

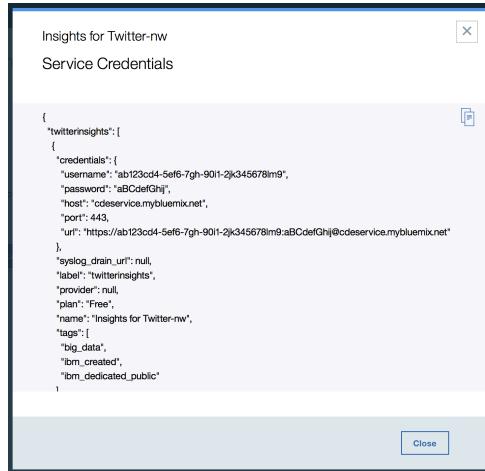
1. Add a  node as shown below to expose a web URL endpoint.



2. Checking for scenarios where errors might happen is a good programming habit to have. We should check whether the query parameter *q* is passed in. If not, we should display an error message. Add a  node as shown below. We'll connect the second output to an error message later on in step #18.



3. Return to the Connections tab in the application overview in the Bluemix console. Under the Insights for Twitter service tile, click on **View Credentials**. Copy the value in the **username** and **password** properties.



4. Add a node as shown below. This will set the request URL for the HTTP request node in the next step.

```

msg.url = 'https://cdeservice.mybluemix.net/api/v1/messages/search?size=500&q=' + msg.payload.q;
return msg;

```



Get the code:
ibm.biz/Bd457G

5. Add a node as shown below. This will make a HTTP request using the URL from the function node and return tweets that match the search criteria in *msg.payload*. Use the username and password values from step #3, and change the return value to return a parsed JSON object.

Edit http request node

Method: GET

URL: http://

Enable secure (SSL/TLS) connection:

Use basic authentication:

Username: ab123cd4-5ef6-7gh-90i1-2jk345678lm9

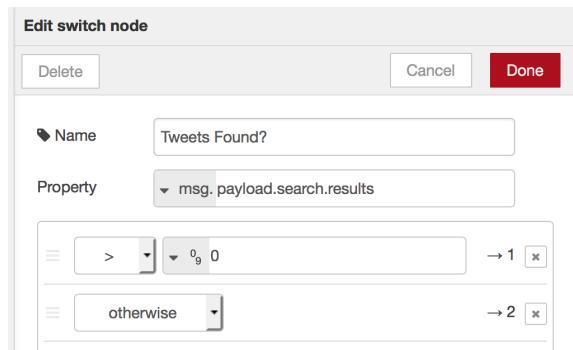
Password:

Return: a parsed JSON object

Name: Insights for Twitter

Tip: If the JSON parse fails the fetched string is returned as-is.

6. What happens if there are no tweets found? Add a  node as shown below to check for this scenario. This switch node tests the number of results. If the number of tweets is greater than 0, we'll continue processing normally. Otherwise, we'll proceed to show an error message. We'll connect the second output to an error message later on in step #18.



7. Now that we have an array of tweets, we will concatenate the tweets together so that the IBM Watson Personality Insights service can analyze this content. Add a  node as shown below.

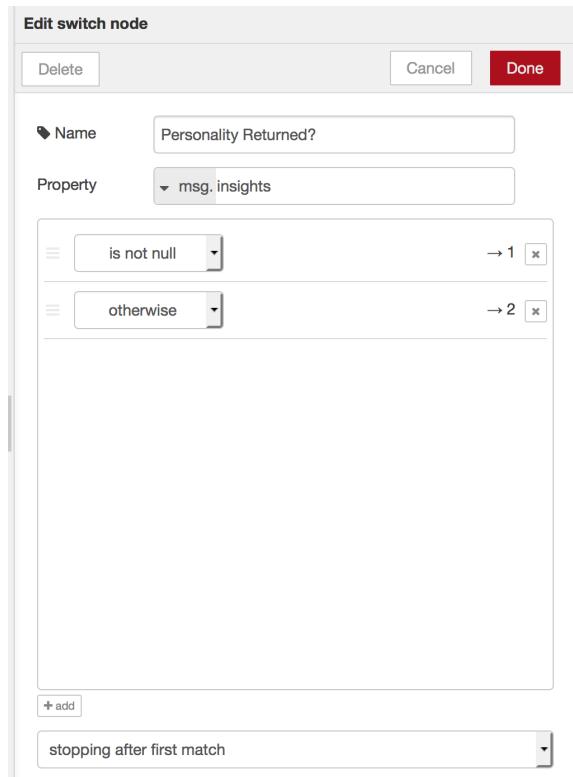


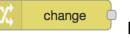
Get the code:
ibm.biz/Bd457n

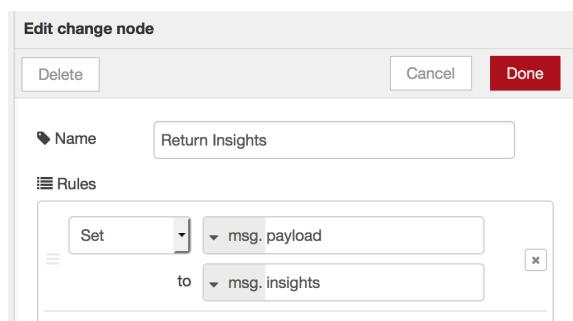
8. Add a  node as shown below. Because we added the IBM Watson Personality Insights service to our application, the credentials will be automatically read from the environment and used by the node. The IBM Watson Personality Insights service can analyze content in English or Spanish. Select English.



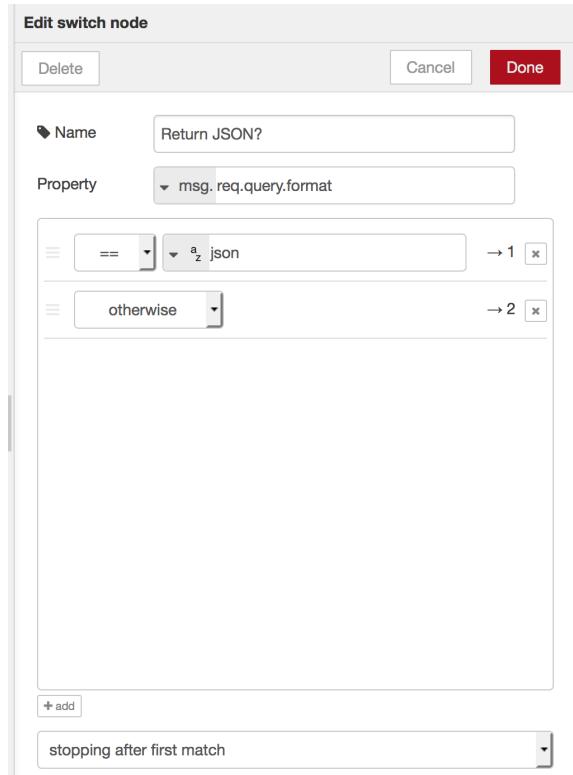
9. The IBM Watson Personality Insights service requires a minimum of a hundred words for a basic analysis. For statistically significant results, you need at least 3500 words and ideally 6000 words. Add a  switch node as shown below to check if a result is returned and proceed with the flow. Otherwise, we'll proceed to show an error message. We'll connect the second output to an error message later on in step #18.



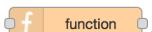
10. The results from the IBM Watson Personality Insights node will reside in the *msg.insights*. Add a  change node to move the results to *msg.payload* as shown below.

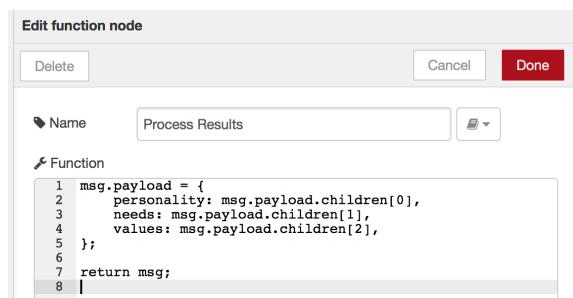


11. To make this application versatile, we'll split the flow so our application can return the results in two formats. The first option will be where the results are returned in JSON format, great for use in applications that can call the web endpoint and consume the JSON. The second option will be a webpage showing the results in a human readable report. Add a  node as shown below.



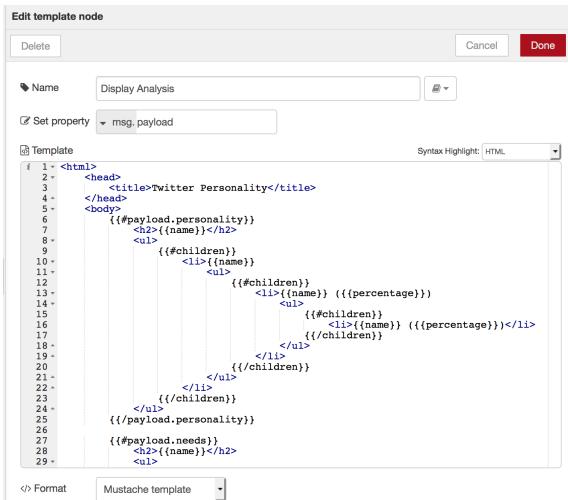
12. For the flow where the JSON should be returned, we can simply return the contents of `msg.payload`. Add a  to complete the flow.

13. For the flow where a webpage should be returned, we need to rearrange the results to simplify accessibility in the next step. Add a  as shown below.



Get the code:
ibm.biz/Bd457b

14. Add a  node with the HTML in the file named 4-display-analysis.html. This HTML will display the results in a human readable format when viewed in a web browser.



```

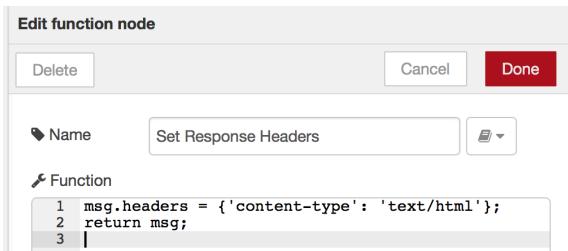
1 <html>
2   <head>
3     <title>Twitter Personality</title>
4   </head>
5   <body>
6     {{#payload.personality}}
7       <h2>{{name}}</h2>
8       <ul>
9         {{#children}}
10        <li>{{name}} {{percentage}}</li>
11        {{#children}}
12          <ul>
13            <li>{{name}} {{percentage}}</li>
14          {{/children}}
15        </ul>
16      {{/children}}
17    </ul>
18  {{/payload.personality}}
19
20  {{#payload.needs}}
21    <h2>{{name}}</h2>
22    <ul>
23      {{/children}}
24    {{/ul}}
25  {{/payload.needs}}
26
27  {{#payload.personality}}
28    <h2>{{name}}</h2>
29    <ul>

```



Get the code:
ibm.biz/Bd457p

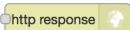
15. Add a  node to change the content-type as shown below. This will inform the browser to return the content as a webpage.



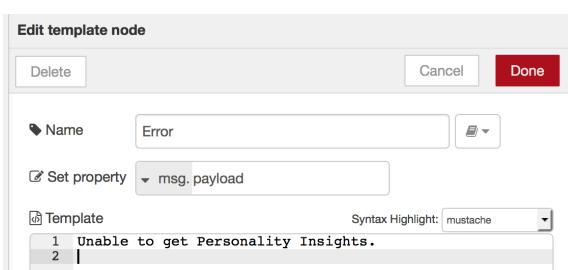
```

msg.headers = {'content-type': 'text/html'};
return msg;
|

```

16. Connect this node to the  node added in step #12.

17. The last step is to add a  node with the error message shown below.

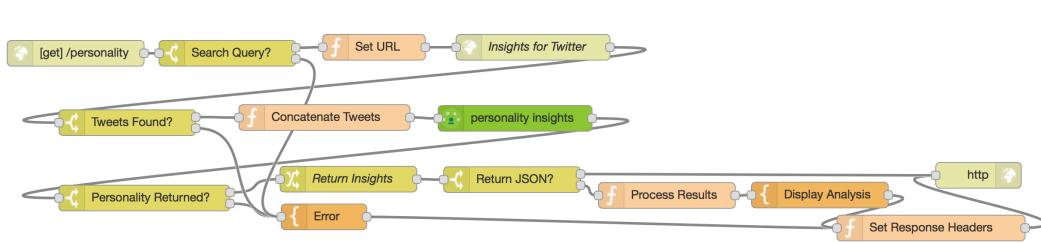


```

Error
Syntax Highlight: mustache
1 Unable to get Personality Insights.
2 |

```

18. Connect to the input of this node from the switch nodes that we created in steps #2, #6, and #9. Connect the output of this node to the node added in step #12. The completed flow is shown below.



Get the code:
ibm.biz/Bd457A

19. Click on the red button in the upper-right corner of the screen to save and deploy your changes.

20. Congratulations! You've completed the programming part of this lab. Now let's analyze a user's tweets. Copy the following URL into a browser's address bar.

`http://<<MY-APP>>.mybluemix.net/personality?q=from:<<USERNAME>>`

- Replace <<MY-APP>> with the host of the Node-RED application you chose.
- Replace <<USERNAME>> with the Twitter user (with a sufficient number of tweets) to analyze

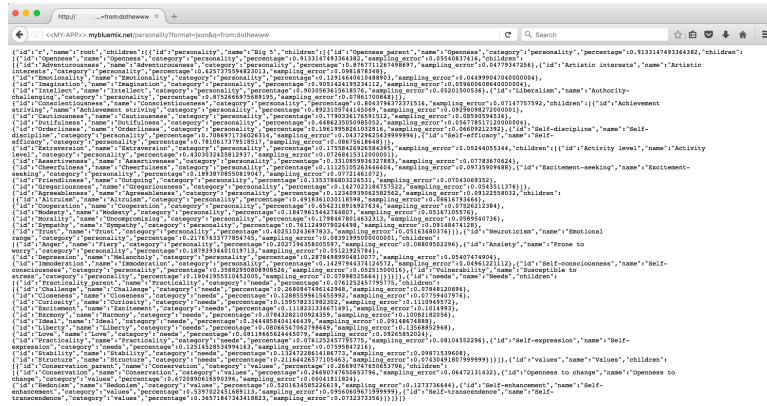
21. Depending on the tweets from the user you choose to analyze, you'll see the individuals' intrinsic personality characteristics, including Big Five, Needs and Values inferred from the tweets.

Big 5

- Openness
 - Openness (0.913314749336482)
 - Adventurousness (0.8767711467496697)
 - Curiosity (0.787577119629423)
 - Emotionality (0.1291464061048800)
 - Imagination (0.9651242195234112)
 - Intellect (0.8951242195234112)
 - Authority-challenging (0.8723666975889195)
 - Achievement striving (0.892105744145069)
 - Curiosity (0.892105744145069)
 - Dutifulness (0.648623509085052)
 - Orderliness (0.19619958261032816)
 - Shyness (0.892105744145069)
 - Self-efficacy (0.781061737918517)
- Extraversion
 - Extraversion (0.4830312425812937)
 - Activity level (0.4830312425812937)
 - Assertiveness (0.875112510544811)
 - cheerfulness (0.11125105263646404)
 - Excitement-seeking (0.1002105263646404)
 - Gregariousness (0.142702184717522)
 - Aggressiveness (0.4918361030118598)
 - Arrogance (0.4918361030118598)
 - Boldness (0.4918361030118598)
 - Modesty (0.1877905442764807)
 - Sympathy (0.7617124907932449)
 - Trust (0.402510245979333)
- Agreeableness
 - Agreeableness (0.4918361030118598)
 - Loyalty (0.2027196358005597)
 - Trust (0.2027196358005597)
 - Benevolence (0.159782119629423)
 - Extraversion (0.1182133334671491)
 - Harmoniousness (0.1182133334671491)
 - Ideal (0.3444858040146439)
 - Love (0.08119656264445079)
 - Pragmaticity (0.0761252457795775)
- Needs
 - Practically (0.0761252457795775)
 - Challenge (0.269847496142948)
 - Curiosity (0.159782119629423)
 - Extraversion (0.1182133334671491)
 - Harmoniousness (0.1182133334671491)
 - Ideal (0.3444858040146439)
 - Love (0.08119656264445079)
 - Pragmaticity (0.0761252457795775)

22. To see the JSON representation of the results, insert `format=json` in the URL query string:

<http://<<MY-APP>>.mybluemix.net/personality?format=json&q=from:<<USERNAME>>>



The screenshot shows a browser window with the URL `http://<<MY-APP>>.mybluemix.net/personality?format=json&q=from:<<USERNAME>>`. The page displays a large JSON object representing a personality profile. The root node is a child node of the 'personality' category, with a percentage of 0.9133147493544382. It has several children, including 'Big 5', 'Children', 'Openness', 'Conscientiousness', 'Extraversion', 'Agreeableness', 'Neuroticism', 'Emotional stability', 'Personality', 'Self-control', 'Modesty', 'Cheerfulness', 'Optimism', 'Agreeableness', 'Cooperation', 'Moral', 'Unconscious', 'Modesty', 'Honesty', 'Immoderation', 'Self-expression', 'Needs', 'Values', and 'Enhancement'. Each category has its own percentage, sampling error, and a detailed breakdown of its sub-components.

```
{
  "id": "1",
  "name": "personality",
  "children": [
    {
      "id": "1-1",
      "name": "Big 5",
      "children": [
        {
          "id": "1-1-1",
          "name": "Openness",
          "percentage": 0.9133147493544382,
          "sampling_error": 0.0476711587498977,
          "category": "personality"
        },
        {
          "id": "1-1-2",
          "name": "Conscientiousness",
          "percentage": 0.1076711587498977,
          "sampling_error": 0.0477947347256,
          "category": "personality"
        },
        {
          "id": "1-1-3",
          "name": "Extraversion",
          "percentage": 0.12914464932488905,
          "sampling_error": 0.04499001360000004,
          "category": "personality"
        },
        {
          "id": "1-1-4",
          "name": "Agreeableness",
          "percentage": 0.12914464932488905,
          "sampling_error": 0.04499001360000004,
          "category": "personality"
        },
        {
          "id": "1-1-5",
          "name": "Neuroticism",
          "percentage": 0.12914464932488905,
          "sampling_error": 0.04499001360000004,
          "category": "personality"
        }
      ]
    },
    {
      "id": "1-2",
      "name": "Children",
      "percentage": 0.9133147493544382,
      "sampling_error": 0.0476711587498977,
      "category": "personality"
    },
    {
      "id": "1-3",
      "name": "Openness",
      "percentage": 0.9133147493544382,
      "sampling_error": 0.0476711587498977,
      "category": "personality"
    },
    {
      "id": "1-4",
      "name": "Conscientiousness",
      "percentage": 0.1076711587498977,
      "sampling_error": 0.0477947347256,
      "category": "personality"
    },
    {
      "id": "1-5",
      "name": "Extraversion",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-6",
      "name": "Agreeableness",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-7",
      "name": "Neuroticism",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-8",
      "name": "Emotional stability",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-9",
      "name": "Personality",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-10",
      "name": "Self-control",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-11",
      "name": "Modesty",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-12",
      "name": "Cheerfulness",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-13",
      "name": "Optimism",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-14",
      "name": "Agreeableness",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-15",
      "name": "Cooperation",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-16",
      "name": "Moral",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-17",
      "name": "Unconscious",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-18",
      "name": "Modesty",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-19",
      "name": "Honesty",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-20",
      "name": "Immoderation",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-21",
      "name": "Self-expression",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-22",
      "name": "Needs",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-23",
      "name": "Values",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    },
    {
      "id": "1-24",
      "name": "Enhancement",
      "percentage": 0.12914464932488905,
      "sampling_error": 0.04499001360000004,
      "category": "personality"
    }
  ]
}
```

23. You can also modify the query parameter `q` to search for a search term instead of tweets by a specific user. Use the respective URLs:

<http://<<MY-APP>>.mybluemix.net/personality?q=<<SEARCH-TERM>>>

<http://<<MY-APP>>.mybluemix.net/personality?format=json&q=<<SEARCH-TERM>>>