

## Chapter 6 - Data Sourcing via Web

## Part 2 - NavigableString Objects

```
In [1]: import sys  
print(sys.version)
```

3.7.6 (default, Jan 8 2020, 20:23:39) [MSC v.1916 64 bit (AMD64)]

```
In [2]: from bs4 import BeautifulSoup
```

## NavigableString objects

```
In [3]: soup_object = BeautifulSoup('<h1 attribute_1 = "Heading Level 1">Future Trends in IoT in 2020')  
tag = soup_object.h1  
type(tag)
```

Out[3]: bs4.element.Tag

```
In [4]: tag.name
```

Out[4]: 'h1'

```
In [5]: type(tag.string)
```

Out[5]: bs4.element.NavigableString

```
In [6]: our_navigatable_string = tag.string  
our_navigatable_string
```

Out[6]: 'Future Trends in IoT in 2020'

```
In [ ]: our_navigatable_string.replace_with('NaN')  
tag.string
```

The above method didn't work in this version. 3.7.6 (default, Jan 8 2020, 20:23:39) [MSC v.1916 64 bit (AMD64)]

## Utilizing NavigableString objects

```
In [16]: our_html_document = '''
<html><head><title>IoT Articles</title></head>
<body>
<p class='title'><b>2018 Trends: Best New IoT Device Ideas for Data Scientists ar

<p class='description'>It's almost 2018 and IoT is on the cusp of an explosive ex
<br>
<br>
It's almost 2018 and IoT is on the cusp of an explosive expansion. In this article
<h1>Looking Back at My Coolest IoT Find in 2017</h1>
Before going into detail about best new IoT device ideas, here's the backstory. <

It wasn't until I got to the Ericsson Studio that I became extremely impressed by

This car is connected to Ericsson's Connected Vehicle Cloud, an IoT platform that

To understand how it works, imagine you're pulling your normal 9-to-5 and you know

To watch some of the amazing IoT device demos I witnessed at Ericsson Studio, make
<h1>Future Trends for IoT in 2018</h1>
New IoT device ideas won't do you much good unless you at least know the basic tech
<ol>
    <li><strong>Big Data</strong> & Data Engineering: Sensors that are embedded
    <li><strong>Machine Learning</strong> Data Science: While a lot of IoT devices
    <li><strong>Blockchain</strong>-Enabled Security: Above all else, IoT networks
</ol>
<h1>Best New IoT Device Ideas</h1>
This listing of new IoT device ideas has been sub-divided according to the main tech
<h2>Raspberry Pi IoT Ideas</h2>
Using Raspberry Pi as open-source hardware, you can build IoT applications that can
<ol>
    <li>Enable built-in sensing to build a weather station that measures ambient
    <li>Build a system that detects discrepancies in electrical readings to identify
    <li>Use IoT to build a Servo that is controlled by motion detection readings<
    <li>Build a smart control switch that operates devices based on external stimuli
    <li>Build a music playing application that enables music for each room in your
    <li>Implement biometrics on IoT-connected devices</li>
</ol>
<h2>Arduino IoT Ideas</h2>
There are a number of new IoT device ideas that deploy Arduino as a microcontroller
<ol>
    <li>Integrate Arduino with Android to build a remote-control RGB LED device.<
    <li>Connect PIR sensors across the IoT to implement a smart building.</li>
    <li>Build a temperature and sunlight sensor system to remotely monitor and control
    <li>Deploy Arduino and IoT to automate your neighborhood streetlights.</li>
    <li>Build a smart irrigation system based on IoT-connected temperature and moisture
</ol>
[caption id="attachment\_3807" align="center" width="300"\]<a href="bit.ly/LPI
<h2>Wireless \(GSM\) IoT Ideas</h2>
Several new IoT device ideas are developed around the GSM wireless network. Those
<ol>
    <li>Monitor soil moisture to automate agricultural irrigation cycles.</li>
    <li>Automate and control the conditions of a greenhouse.</li>
    <li>Enable bio-metrics to build a smart security system for your home or office
    <li>Build an autonomously operating fitness application that automatically monitors
    <li>Build a healthcare monitoring system that tracks, informs, and automatically
```

```
</ol>
<h2>IoT Automation Ideas</h2>
Almost all new IoT device ideas offer automation benefits, but to outline a few n
<ol>
    <li>Build an IoT device that automatically locates and reports the closest ne
    <li>Build a motion detection system that automatically issues emails or sms n
    <li>Use temperature sensors connected across the IoT to automatically alert y
    <li>Use bio-metric sensors to build a smart system that automate security for
</ol>
To learn more about IoT and what's happening on the leading edge, be sure to pop

<em>(I captured some of this content on behalf of DevMode Strategies during an in
<p class='description'>...</p>
'''
our_soup_object = BeautifulSoup(our_html_document, 'html.parser')
```

```
In [18]: for string in our_soup_object.stripped_strings:
          print(repr(string))
```

```
'IoT Articles'
'2018 Trends: Best New IoT Device Ideas for Data Scientists and Engineers'
'It's almost 2018 and IoT is on the cusp of an explosive expansion. In this a
rticle, I offer you a listing of new IoT device ideas that you can use...'
'It's almost 2018 and IoT is on the cusp of an explosive expansion. In this a
rticle, I offer you a listing of new IoT device ideas that you can use to get
practice in designing your first IoT applications.'
'Looking Back at My Coolest IoT Find in 2017'
'Before going into detail about best new IoT device ideas, here's the backsto
ry.'
'Last month Ericsson Digital invited me'
'to tour the Ericsson Studio in Kista, Sweden. Up until that visit,'
'IoT'
'had been largely theoretical to me. Of course, I know the usual mumbo-jumbo
about wearables and IoT-connected fitness trackers. That stuff is all well an
d good, but it's somewhat old hat - plus I am not sure we are really benefiti
ng so much from those, so I'm not that impressed.\n\nIt wasn't until I got to
the Ericsson Studio that I became extremely impressed by how far IoT has real
ly come. Relying on the promise of the 5g network expansion, IoT-powered smar
t devices are on the cusp of an explosive growth in adoption. It was Ericss
n's Smart Car that sent me reeling:'
'This car is connected to Ericsson's Connected Vehicle Cloud, an IoT platform
that manages services for the Smart Cars to which it's connected. The Volvo p
ictured above acts as a drop-off location for groceries that have been ordere
d by its owner.\n\nTo understand how it works, imagine you're pulling your no
rmal 9-to-5 and you know you need to grab some groceries on your way home. We
ll, since you're smart you've used Ericsson IoT platform to connect your car
to the local grocery delivery service ('
'Mat.se'
'), so all you need to do is open the Mat.se app and make your usual order. M
at.se automatically handles the payment, grocery selection, delivery, and del
ivery scheduling. Since your car is IoT-enabled, Mat.se issues its trusted de
livery agent a 1-time token to use for opening your car in order to place you
r groceries in your car for you at 4:40 pm (just before you get off from wor
k).\n\nTo watch some of the amazing IoT device demos I witnessed at Ericsson
Studio, make sure to go'
'watch the videos on this page'
'.'
'Future Trends for IoT in 2018'
'New IoT device ideas won't do you much good unless you at least know the bas
ic technology trends that are set to impact IoT over the next year(s). These
include:'
'Big Data'
'& Data Engineering: Sensors that are embedded within IoT devices spin off ma
chine-generated data like it's going out of style. For IoT to function, the p
latform must be solidly engineered to handle big data. Be assured, that requi
res some serious data engineering.'
'Machine Learning'
'Data Science: While a lot of IoT devices are still operated according to rul
es-based decision criteria, the age of artificial intelligence is upon us. Io
T will increasingly depend on machine learning algorithms to control device o
perations so that devices are able to autonomously respond to a complex set o
f overlapping stimuli.'
```

```

'Blockchain'
'-Enabled Security: Above all else, IoT networks must be secure. Blockchain technology is primed to meet the security demands that come along with building and expanding the IoT.'
'Best New IoT Device Ideas'
'This listing of new IoT device ideas has been sub-divided according to the main technology upon which the IoT devices are built. Below I'm providing a list of new IoT device ideas, but for detailed instructions on how to build these IoT applications, I recommend the'
'IoT courses on Udemy'
'(\P Please note: if you purchase a Udemy course through this link, I may receive a small commission), or courses that are available at'
'SkyFi'
'and'
'Coursera'
'.'
'Raspberry Pi IoT Ideas'
'Using Raspberry Pi as open-source hardware, you can build IoT applications that offer any one of the following benefits:'
'Enable built-in sensing to build a weather station that measures ambient temperature and humidity'
'Build a system that detects discrepancies in electrical readings to identify electricity theft'
'Use IoT to build a Servo that is controlled by motion detection readings'
'Build a smart control switch that operates devices based on external stimuli. Use this for home automation.'
'Build a music playing application that enables music for each room in your house'
'Implement biometrics on IoT-connected devices'
'Arduino IoT Ideas'
'There are a number of new IoT device ideas that deploy Arduino as a microcontroller. These include:'
'Integrate Arduino with Android to build a remote-control RGB LED device.'
'Connect PIR sensors across the IoT to implement a smart building.'
'Build a temperature and sunlight sensor system to remotely monitor and control the conditions of your garden.'
'Deploy Arduino and IoT to automate your neighborhood streetlights.'
'Build a smart irrigation system based on IoT-connected temperature and moisture sensors built-in to your agricultural plants.'
'[caption id="attachment_3807" align="aligncenter" width="300"]'
'An IoT Chatbot Tree at the Ericsson Studio[/caption]'
'Wireless (GSM) IoT Ideas'
'Several new IoT device ideas are developed around the GSM wireless network. Those are:'
'Monitor soil moisture to automate agricultural irrigation cycles.'
'Automate and control the conditions of a greenhouse.'
'Enable bio-metrics to build a smart security system for your home or office building'
'Build an autonomously operating fitness application that automatically makes recommendations based on motion detection and heart rate sensors that are embedded on wearable fitness trackers.'
'Build a healthcare monitoring system that tracks, informs, and automatically alerts healthcare providers based on sensor readings that describe a patient's vital statistics (like temperature, pulse, blood pressure, etc).'
```

'IoT Automation Ideas'

'Almost all new IoT device ideas offer automation benefits, but to outline a few more ideas:'

```
'Build an IoT device that automatically locates and reports the closest nearby parking spot.'
'Build a motion detection system that automatically issues emails or sms messages to alert home owners of a likely home invasion.'
'Use temperature sensors connected across the IoT to automatically alert you if your home windows or doors have been left open.'
'Use bio-metric sensors to build a smart system that automate security for your home or office building'
'To learn more about IoT and what's happening on the leading edge, be sure to pop over to Ericsson's Studio Tour recap and'
'watch these videos'
'.'
'(I captured some of this content on behalf of DevMode Strategies during an invite-only tour of the Ericsson Studio in Kista. Rest assured, the text and\
0opinions are my own'
')'
'....'
```

```
In [19]: first_link = our_soup_object.a
print(first_link)
```

```
<a href="http://bit.ly/LPlNDJj">Last month Ericsson Digital invited me</a>
```

```
In [20]: first_link.parent
```

```
Out[20]: <strong><a href="http://bit.ly/LPlNDJj">Last month Ericsson Digital invited me
</a></strong>
```

```
In [21]: first_link.string
```

```
Out[21]: 'Last month Ericsson Digital invited me'
```

```
In [23]: first_link.string.parent
```

```
Out[23]: <a href="http://bit.ly/LPlNDJj">Last month Ericsson Digital invited me</a>
```

```
In [ ]:
```