REST

October 24, 2019

1 Install and use CherryPy

1.1 Install

To install CherryPy just open a terminal and type *"pip3 install cherrypy"*

1.2 "Hello World"

Let's create a new file called *"helloWorld.py"* and paste the following code inside it

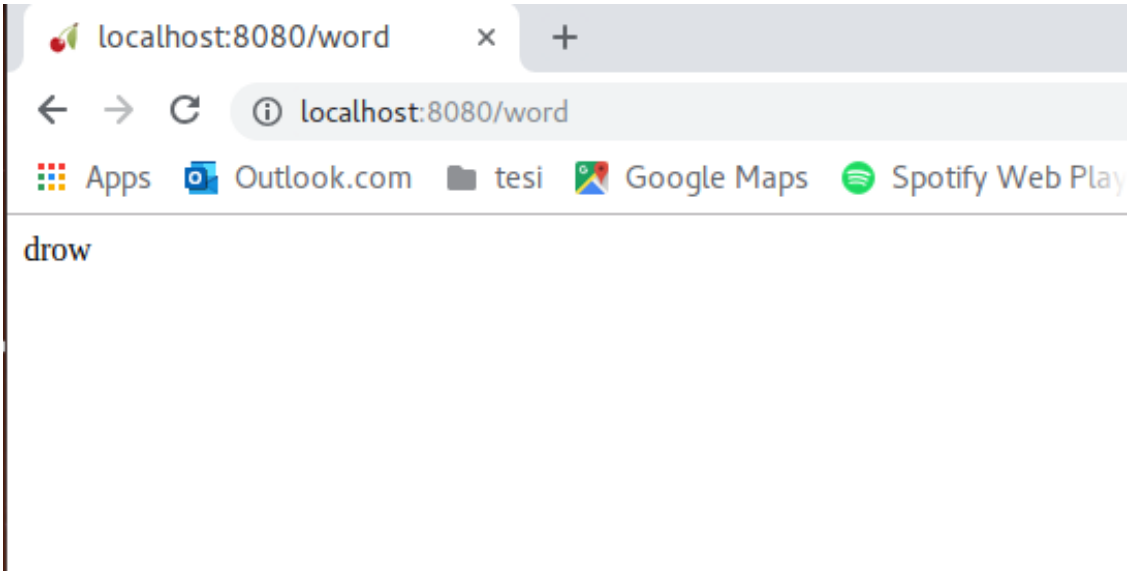
[1]:
```
import cherrypy

class HelloWorld(object):
    exposed=True
    def GET(self,*uri,**params):
        #Standard output
        output="Hello World"
        #Check the uri in the requests
        #<br> is just used to append the content in a new line
        #(<br> is the \n for HTML)
        if len(uri)!=0:
            output+='<br>uri: '+','.join(uri)
        #Check the parameters in the request
        #<br> is just used to append the content in a new line
        #(<br> is the \n for HTML)
        if params!={}:
            output+='<br>params: '+str(params)
        return output

if __name__=="__main__":
    #Standard configuration to serve the url "localhost:8080"
    conf={
        '/':{
                'request.dispatch':cherrypy.dispatch.MethodDispatcher(),
                'tool.session.on':True
        }
    }
```

```
    cherrypy.quickstart(HelloWorld(),'/',conf)
```

```
[14/Oct/2019:10:54:21] ENGINE Listening for SIGTERM.
[14/Oct/2019:10:54:21] ENGINE Listening for SIGHUP.
[14/Oct/2019:10:54:21] ENGINE Listening for SIGUSR1.
[14/Oct/2019:10:54:21] ENGINE Bus STARTING
CherryPy Checker:
The config entry 'tool.session.on' is invalid, because the 'tool' config
namespace is unknown.
section: [/]

[14/Oct/2019:10:54:21] ENGINE Started monitor thread 'Autoreloader'.
[14/Oct/2019:10:54:21] ENGINE Serving on http://127.0.0.1:8080
[14/Oct/2019:10:54:21] ENGINE Bus STARTED

127.0.0.1 - - [14/Oct/2019:10:54:25] "GET / HTTP/1.1" 200 11 "" "Mozilla/5.0
(X11; Ubuntu; Linux x86_64; rv:69.0) Gecko/20100101 Firefox/69.0"
127.0.0.1 - - [14/Oct/2019:10:54:45] "GET /uri1/uri2?a=1&b=3 HTTP/1.1" 200 61 ""
"Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:69.0) Gecko/20100101 Firefox/69.0"

[14/Oct/2019:10:55:01] ENGINE Keyboard Interrupt: shutting down bus
[14/Oct/2019:10:55:01] ENGINE Bus STOPPING
[14/Oct/2019:10:55:01] ENGINE HTTP Server
cherrypy._cpwsgi_server.CPWSGIServer(('127.0.0.1', 8080)) shut down
[14/Oct/2019:10:55:01] ENGINE Stopped thread 'Autoreloader'.
[14/Oct/2019:10:55:01] ENGINE Bus STOPPED
[14/Oct/2019:10:55:01] ENGINE Bus EXITING
[14/Oct/2019:10:55:01] ENGINE Bus EXITED
[14/Oct/2019:10:55:01] ENGINE Waiting for child threads to terminate…
```

1.3 Exercise 1

We want to create a we services that is able to read the uri we send as GET request and return the string reversed, the result is shown in the image below



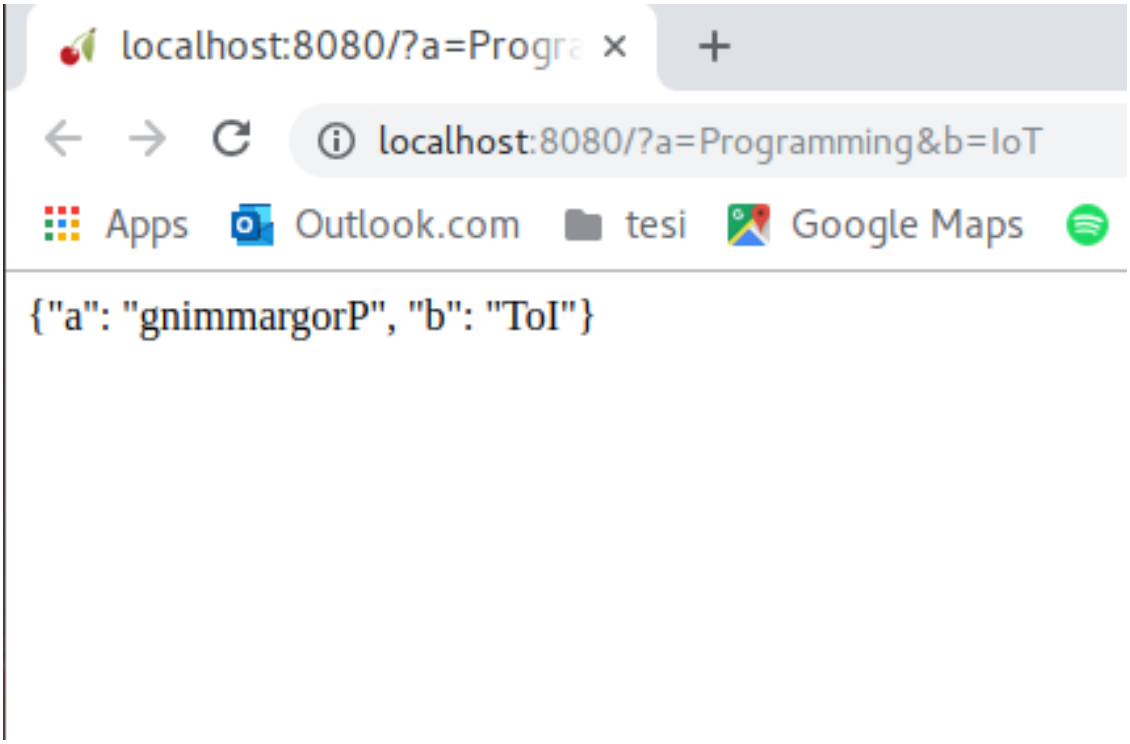
Tips and tricks

1. Once you've created your class you can use the code below inside the "main" function to configure the server (pay attention to the indentaion!)

```
if __name__ == '__main__':
    conf={
        '/':{
                'request.dispatch':cherrypy.dispatch.MethodDispatcher(),
                'tool.session.on':True
        }
    cherrypy.tree.mount(MyWebService(),'/',conf)
    cherrypy.engine.start()
    cherrypy.engine.block()
```

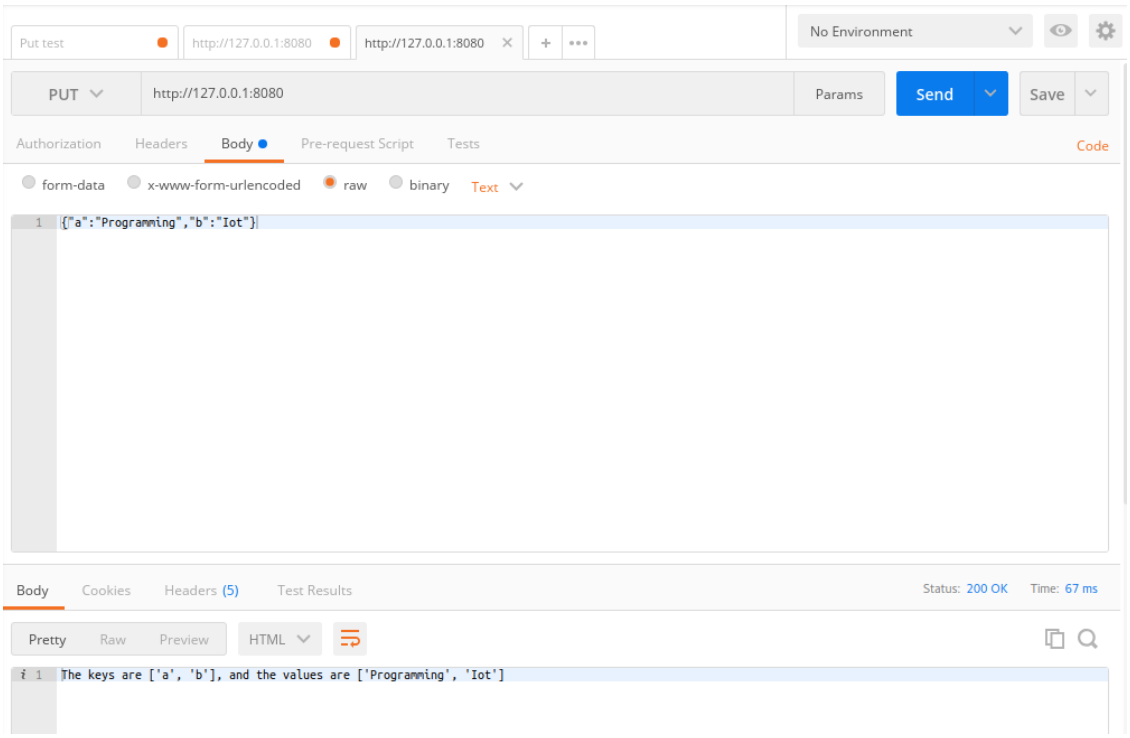
1.4 Exercise 2

Now let's create a web service similar to the one before but instead we want to pass the string to revert as parameter GET request. In this case the result should be a json that look like this:



1.5 Exercise 3

For this exercise we want to create a web services that receive with a PUT request with a json in the body and send us back the list of keys and the list of value of that json like in the picture below.



Tips and tricks

1. You can use "Postman" available at this link to perform a PUT request to your service
2. When you create the json for the body remember to use double quotes ("") to indicate the keys and the values to avoid errors.

1.6 Exercise 4

With this exercise we will try to become familiar with REST APIs. At this link you can find a list of free API, to make this exercise choose one of them that doesn't not require authentication (Auth=No). According to the one you choose you've to make a simple client to interact with it and do some basic search (try to find one that provides json as response and not images). To make the request to the url you can use this python package that you can install writing *"pip install requests"* on your terminal, look at the documentation to understand how you can use it Let's make an example. Let's chose the exchange-rate api and see how the API looks like The three main entry point of the API are:

1. **https://api.exchangeratesapi.io/latest?base=...**
   With this we need to specify the base currency to obtain the exchange rate
2. **https://api.exchangeratesapi.io/YYYY-MM-YY**
   To otain the rate of a particular day
3. **https://api.exchangeratesapi.io/history?start_at=YYYY-MM-YY&end_at=YYYY-MM-YY**
   To obtain the rates in the specified interval

Knowing this we want to create a client that allows 3 function:

1. Obtain the latest exchange rates by specifying the base currency
2. Obtain the exchange rates of a specific day
3. Obtain the rates in an interval of days

The client looks like this:

[1]:
```
run Exercise_4.py
```

```
Available command:
latest:latest change rate
history: historic exchange rates
quit:exit
 latest
Which base currency you want:
E:Euro
U:USD
P:GBP
 E
{
    "rates": {
        "CAD": 1.462,
        "HKD": 8.6266,
```

```
        "ISK": 136.6,
        "PHP": 57.712,
        "DKK": 7.4671,
        "HUF": 333.96,
        "CZK": 25.916,
        "AUD": 1.6122,
        "RON": 4.734,
        "SEK": 10.699,
        "IDR": 15536.74,
        "INR": 79.147,
        "BRL": 4.5207,
        "RUB": 70.7241,
        "HRK": 7.397,
        "JPY": 119.23,
        "THB": 33.701,
        "CHF": 1.0966,
        "SGD": 1.5175,
        "PLN": 4.3416,
        "BGN": 1.9558,
        "TRY": 6.3065,
        "CNY": 7.8249,
        "NOK": 9.8715,
        "NZD": 1.7426,
        "ZAR": 16.278,
        "USD": 1.1026,
        "MXN": 21.4919,
        "ILS": 3.9227,
        "GBP": 0.88813,
        "KRW": 1311.65,
        "MYR": 4.6149
    },
    "base": "EUR",
    "date": "2019-09-17"
}
```


```
Available command:
latest:latest change rate
history: historic exchange rates
quit:exit
 history
Type D for a day and I for and interval
 D
Write the year
 2019
Write the month
 06
Write the day
 26
```

```
{
    "rates": {
        "CAD": 1.4947,
        "HKD": 8.8724,
        "ISK": 141.5,
        "PHP": 58.456,
        "DKK": 7.4651,
        "HUF": 323.5,
        "CZK": 25.486,
        "AUD": 1.6277,
        "RON": 4.722,
        "SEK": 10.5435,
        "IDR": 16097.68,
        "INR": 78.5705,
        "BRL": 4.3624,
        "RUB": 71.6399,
        "HRK": 7.3956,
        "JPY": 122.4,
        "THB": 34.955,
        "CHF": 1.1113,
        "SGD": 1.5387,
        "PLN": 4.2627,
        "BGN": 1.9558,
        "TRY": 6.55,
        "CNY": 7.8139,
        "NOK": 9.6733,
        "NZD": 1.7004,
        "ZAR": 16.2802,
        "USD": 1.1362,
        "MXN": 21.7972,
        "ILS": 4.0825,
        "GBP": 0.89603,
        "KRW": 1312.86,
        "MYR": 4.7124
    },
    "base": "EUR",
    "date": "2019-06-26"
}
```


```
Available command:
latest:latest change rate
history: historic exchange rates
quit:exit
 quit
```

[ ]: