

# Python Astronauts in Space Web API Tutorial

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Time required: 30 minutes

- Comment each line of code as show in the tutorials and other code examples.
- Follow all directions carefully and accurately.
- Think of the directions as minimum requirements.

## Astronauts in Outer Space

Below is a program that will answer the question of how many astronauts are in outer space and will also name them all. It knows this information by sending out a request for that data to an API. This script references Open Notify API which is a completely free and open source project to provide a simple programming interface for some of NASA's awesome data.

As the number of astronauts in space change, the output of the Python script will change as well. This is because the API data is constantly updated to display the most correct information.

Go to <http://api.open-notify.org/astros.json> to see the current raw JSON data.

```
JSON  Raw Data  Headers
Save  Copy  Collapse All  Expand All  🔍 F
message:      "success"
people:
  ▼ 0:
    name:      "Cai Xuzhe"
    craft:      "Tiangong"
  ▼ 1:
    name:      "Chen Dong"
    craft:      "Tiangong"
  ▼ 2:
    name:      "Liu Yang"
    craft:      "Tiangong"
  ▼ 3:
    name:      "Sergey Prokopyev"
    craft:      "ISS"
  ▼ 4:
    name:      "Dmitry Petelin"
    craft:      "ISS"
  ▼ 5:
    name:      "Frank Rubio"
    craft:      "ISS"
  ▼ 6:
    name:      "Nicole Mann"
    craft:      "ISS"
  ▼ 7:
    name:      "Josh Cassada"
    craft:      "ISS"
  ▼ 8:
    name:      "Koichi Wakata"
    craft:      "ISS"
  ▼ 9:
    name:      "Anna Kikina"
    craft:      "ISS"
number:      10
```

## Assignment

Create the following program which demonstrates the API data consumption process.

```
1  """
2      Name: astronauts_in_space.py
3      Author:
4      Created:
5      Purpose: Get astronaut info from api.open-notify.org
6      This API returns the current number, names and spacecraft
7  """
8
9  # Import the requests module
10 import requests
11
12 IS_DEBUGGING = False
13
14
15 def main():
16     ASTRONAUTS_API = "http://api.open-notify.org/astros.json"
17     # Use the requests.get() function with the argument
18     # of the Open Notify API url
19     astronauts = requests.get(ASTRONAUTS_API)
20
21     # Convert the json data into a Python dictionary with key value pairs
22     data = astronauts.json()
23
24     if (IS_DEBUGGING == True):
25         # The status code
26         print('\nThe status code for this API request is',
27               astronauts.status_code, "\n")
28
29         # The raw data from by Open Notify API
30         print('The raw data from the API: \n')
31         print(astronauts.text)
32
33         print('\nThe modified data converted to a Python dictionary.\n')
34         print(data)
35         print(' ')
36         print('Original API data is a', type(astronauts))
37         print('Modified API data is a', type(data))
38         print(' ')
39
40     # Print the data using the dictionary created from the API json data
41     print("-" * 50)
42     # Get number of astronauts from dictionary
43     number = data.get("number")
44     print(
45         f" There are currently {number} astronauts in outer space! \n")
46     print(" The names of the astronauts and their craft")
47
48     print("-" * 50)
```

```

50     # Get the people list of dictionaries
51     people = data.get("people")
52
53     # Iterate through each item in the people list of dictionaries
54     for astronaut in people:
55         # Access each item in each dictionary
56         print(f' {astronaut.get("name")}:20}{astronaut.get("craft")}')
57
58     input(" Press Enter to exit")
59
60
61 # If a standalone program, call the main function
62 # Else, use as a module
63
64 if __name__ == '__main__':
65     main()

```

Example run:

```

-----
There are currently 10 astronauts in outer space!

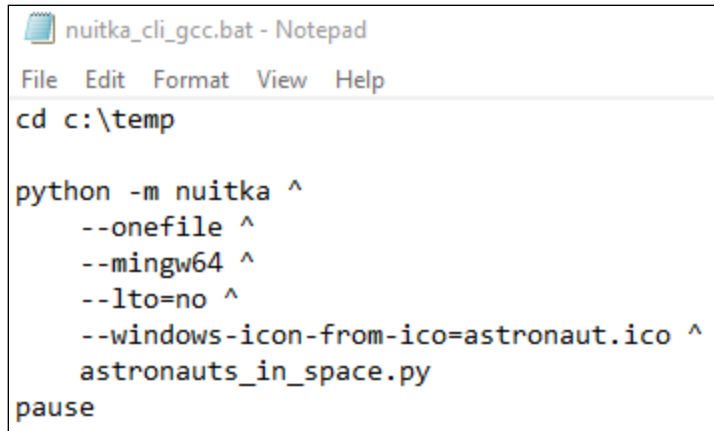
The names of the astronauts and their craft
-----
Cai Xuzhe           Tiangong
Chen Dong           Tiangong
Liu Yang            Tiangong
Sergey Prokopyev    ISS
Dmitry Petelin      ISS
Frank Rubio         ISS
Nicole Mann         ISS
Josh Cassada        ISS
Koichi Wakata       ISS
Anna Kikina         ISS
Press Enter to exit

```

## Suggested Activity: Create a Windows Executable with Nuitka

The Nuitka library will create a standalone Windows executable file from our Python code. Many other methods result in an executable that is detected as a virus.

1. Install the Nuitka package with pip → **pip install nuitka**
2. If haven't already, create a folder for your program files.
3. In your program files folder → create a batch file named **nuitka\_cli.bat**
4. Add the following code to the batch file. This code is specific to cli programs.



```
nuitka_cli_gcc.bat - Notepad
File Edit Format View Help
cd c:\temp

python -m nuitka ^
    --onefile ^
    --mingw64 ^
    --lto=no ^
    --windows-icon-from-ico=astronaut.ico ^
    astronauts_in_space.py
pause
```

5. Create a **c:\temp** folder to use to create the exe file.
6. Copy the files from your program folder to c:\temp
7. Double click **nuitka\_cli.bat**
8. The first time you run nuitka, it will ask you to download and install some compiler tools. Agree to installing the tools.

When the process is complete, you will have an exe file. Double click it to run.

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## Assignment Submission

Attach the program file to the assignment in Blackboard.