income

November 24, 2024

1 Simple Webscraping Example with Beautiful Soup

```
[1]: # Import all neccessary libraries
     from bs4 import BeautifulSoup
     import urllib.request
     import pandas as pd
[2]: # Assign the URL to a variable
     url = "https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/
      →page.cfm?
      ⇒Lang=E&SearchText=M1C&DGUIDlist=2021A0011M1C&GENDERlist=1,2,3&STATISTIClist=1,4&HEADERlist=
     # use the urlopen function to open the webpage
     html = urllib.request.urlopen(url)
     # show object html
     html
[2]: <http.client.HTTPResponse at 0x7f280c077250>
[3]: # Create the BeautifulSoup object
     html_to_parse = BeautifulSoup(html, "html.parser")
[4]: # create a list of tables. There is only 1 table in this webpage
     tables = html_to_parse.find_all("table")
     print(f"Number of tables found: {len(tables)}")
    Number of tables found: 1
[5]: # Create list of all the > tags in the table that has the title_\mathbb{\text{\text{l}}}
      →"2021A0011M1C - Population, 2021 - Counts - Total"
```

```
td = tables[0].find(attrs={"title":"2021A0011M1C - Median total income in 2020<sub>□</sub> 
→among recipients ($) - Rates - Total"})
```

```
[6]: td
```

[6]: 44,000

```
[7]: # convert to float float(td.text.replace(",", ""))
```

[7]: 44000.0

1.1 Create a script that will look up from a list of Postal codes

```
[8]: import urllib.parse as urlparse from urllib.parse import urlencode
```

```
[9]: # A list of postal code from the previous part
    postal = ['M3A', 'M4A', 'M5A', 'M6A', 'M7A', 'M5E', 'M4E', 'M6E', 'M5G',
     'M1J','M2J', 'M3J',
           'M4J',
           'M5J',
           'M5K',
           'M6K',
           'M1L',
           'M2L',
           'M3L',
           'M4L',
           'M5L',
           'M6L',
           'M9L',
           'M1M',
           'M2M',
           'M3M',
           'M4M'.
           'M5M',
           'M6M',
           'M9M',
           'M1N',
           'M2N',
           'M3N',
           'M4N',
           'M5N',
```

```
'M6N', 'M9N',
              'M1P',
              'M2P',
              'M4P',
              'M5P',
              'M6P',
              'M9P',
              'M1R',
              'M2R',
              'M4R',
              'M5R',
              'M6R',
              'M7R',
              'M9R',
              'M1S',
                     'M4S',
              'M5S',
              'M6S',
              'M1T',
              'M4T',
              'M5T',
              'M1V',
              'M4V',
              'M5V',
              'W8V',
              'M9V',
              'M1W',
              'M4W',
              'M5W',
              'M8W',
              'M9W',
              'M1X',
              'M4X',
              'M5X',
              'M8X',
              'M7Y',
              'M8Y',
              'M8Z',]
[10]: # Creating Empty DataFrame and Storing it in variable df
      df = pd.DataFrame(columns = ['postal_code', 'data', 'value'])
[11]: # Loop through each postal code
      import numpy as np
      for i in postal:
```

```
url = "https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/

details/page.cfm?Lang=E"

  params = {
       'SearchText': i,
      'DGUIDlist': '2021A0011'+i
  }
  # this part switches up the postal code parameter in the url
  url_parts = list(urlparse.urlparse(url))
  query = dict(urlparse.parse_qsl(url_parts[4]))
  query.update(params)
  url_parts[4] = urlencode(query)
  query = urlparse.urlunparse(url_parts)
  # the following code is similar to the above
  html = urllib.request.urlopen(query)
  html_to_parse = BeautifulSoup(html, "html.parser")
  tables = html_to_parse.find_all("table")
  print(f"Number of tables found: {len(tables)}")
  tables = html_to_parse.find_all("table")
  if len(tables) == 0:
      print("No tables found on this page.")
      continue # Skip to the next iteration
  # change the title to find the data you want
  title = (f"2021A0011{i} - Median total income in 2020 among recipients ($)

¬─ Rates - Total")

  td = tables[0].find(attrs={"title":title})
  print(td)
  if td:
      try:
           # Try to convert text to float
          value = float(td.text.replace(",", ""))
      except ValueError:
           # Handle suppressed data or invalid values
          value = np.nan
          print(f"Data suppressed or invalid for {i}, setting value to NaN.")
      df.loc[len(df.index)] = [i, title, value]
```

else:

print(f"No data found for title: {title}")

```
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M3A
geo2021A0011M3Astat4 geo2021A0011M3Astat4gen1" title="2021A0011M3A - Median
total income in 2020 among recipients ($) - Rates - Total"> 37,600
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4A
geo2021A0011M4Astat4 geo2021A0011M4Astat4gen1" title="2021A0011M4A - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M5A
geo2021A0011M5Astat4 geo2021A0011M5Astat4gen1" title="2021A0011M5A - Median
total income in 2020 among recipients ($) - Rates - Total"> 43,200
Number of tables found: 1
geo2021A0011M6Astat4 geo2021A0011M6Astat4gen1" title="2021A0011M6A - Median
total income in 2020 among recipients ($) - Rates - Total"> 36,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M7A
geo2021A0011M7Astat4 geo2021A0011M7Astat4gen1" title="2021A0011M7A - Median
total income in 2020 among recipients ($) - Rates - Total"><abbr
title="suppressed to meet the confidentiality requirements of the Statistics
Act">x</abbr>
Data suppressed or invalid for M7A, setting value to NaN.
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M5E
geo2021A0011M5Estat4 geo2021A0011M5Estat4gen1" title="2021A0011M5E - Median
total income in 2020 among recipients ($) - Rates - Total"> 67,000
Number of tables found: 1
geo2021A0011M4Estat4 geo2021A0011M4Estat4gen1" title="2021A0011M4E - Median
total income in 2020 among recipients ($) - Rates - Total"> 56,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M6E
geo2021A0011M6Estat4 geo2021A0011M6Estat4gen1" title="2021A0011M6E - Median
total income in 2020 among recipients ($) - Rates - Total"> 36,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M5G
geo2021A0011M5Gstat4 geo2021A0011M5Gstat4gen1" title="2021A0011M5G - Median
total income in 2020 among recipients ($) - Rates - Total"> 43,600
Number of tables found: 1
geo2021A0011M6Gstat4 geo2021A0011M6Gstat4gen1" title="2021A0011M6G - Median
total income in 2020 among recipients ($) - Rates - Total"> 43,600
Number of tables found: 1
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<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M2H
geo2021A0011M2Hstat4 geo2021A0011M2Hstat4gen1" title="2021A0011M2H - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M3H
geo2021A0011M3Hstat4 geo2021A0011M3Hstat4gen1" title="2021A0011M3H - Median
total income in 2020 among recipients ($) - Rates - Total"> 40,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4H
geo2021A0011M4Hstat4 geo2021A0011M4Hstat4gen1" title="2021A0011M4H - Median
total income in 2020 among recipients ($) - Rates - Total"> 28,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M5H
geo2021A0011M5Hstat4 geo2021A0011M5Hstat4gen1" title="2021A0011M5H - Median
total income in 2020 among recipients ($) - Rates - Total"> 60,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M6H
geo2021A0011M6Hstat4 geo2021A0011M6Hstat4gen1" title="2021A0011M6H - Median
total income in 2020 among recipients ($) - Rates - Total"> 40,400
Number of tables found: 1
geo2021A0011M1Jstat4 geo2021A0011M1Jstat4gen1" title="2021A0011M1J - Median
total income in 2020 among recipients ($) - Rates - Total"> 33,200
Number of tables found: 1
geo2021A0011M2Jstat4 geo2021A0011M2Jstat4gen1" title="2021A0011M2J - Median
total income in 2020 among recipients ($) - Rates - Total"> 36,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M3J
geo2021A0011M3Jstat4 geo2021A0011M3Jstat4gen1" title="2021A0011M3J - Median
total income in 2020 among recipients ($) - Rates - Total"> 32,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4J
geo2021A0011M4Jstat4 geo2021A0011M4Jstat4gen1" title="2021A0011M4J - Median
total income in 2020 among recipients ($) - Rates - Total"> 43,200
Number of tables found: 1
geo2021A0011M5Jstat4 geo2021A0011M5Jstat4gen1" title="2021A0011M5J - Median
total income in 2020 among recipients ($) - Rates - Total"> 62,800
Number of tables found: 0
No tables found on this page.
Number of tables found: 1
geo2021A0011M6Kstat4 geo2021A0011M6Kstat4gen1" title="2021A0011M6K - Median
total income in 2020 among recipients ($) - Rates - Total"> 42,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1L
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geo2021A0011M1Lstat4 geo2021A0011M1Lstat4gen1" title="2021A0011M1L - Median

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total income in 2020 among recipients ($) - Rates - Total"> 34,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M2L
geo2021A0011M2Lstat4 geo2021A0011M2Lstat4gen1" title="2021A0011M2L - Median
total income in 2020 among recipients ($) - Rates - Total"> 47,200
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M3L
geo2021A0011M3Lstat4 geo2021A0011M3Lstat4gen1" title="2021A0011M3L - Median
total income in 2020 among recipients ($) - Rates - Total"> 32,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4L
geo2021A0011M4Lstat4 geo2021A0011M4Lstat4gen1" title="2021A0011M4L - Median
total income in 2020 among recipients ($) - Rates - Total"> 51,600
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No tables found on this page.
Number of tables found: 1
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geo2021A0011M6Lstat4 geo2021A0011M6Lstat4gen1" title="2021A0011M6L - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,000
Number of tables found: 1
geo2021A0011M9Lstat4 geo2021A0011M9Lstat4gen1" title="2021A0011M9L - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,200
Number of tables found: 1
geo2021A0011M1Mstat4 geo2021A0011M1Mstat4gen1" title="2021A0011M1M - Median
total income in 2020 among recipients ($) - Rates - Total"> 37,200
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M2M
geo2021A0011M2Mstat4 geo2021A0011M2Mstat4gen1" title="2021A0011M2M - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M3M
geo2021A0011M3Mstat4 geo2021A0011M3Mstat4gen1" title="2021A0011M3M - Median
total income in 2020 among recipients ($) - Rates - Total"> 35,200
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4M
geo2021A0011M4Mstat4 geo2021A0011M4Mstat4gen1" title="2021A0011M4M - Median
total income in 2020 among recipients ($) - Rates - Total"> 49,200
Number of tables found: 1
geo2021A0011M5Mstat4 geo2021A0011M5Mstat4gen1" title="2021A0011M5M - Median
total income in 2020 among recipients ($) - Rates - Total"> 62,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M6M
geo2021A0011M6Mstat4 geo2021A0011M6Mstat4gen1" title="2021A0011M6M - Median
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total income in 2020 among recipients (\$) - Rates - Total"> 34,000

Number of tables found: 1

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 34,000

Number of tables found:1
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44,000

Number of tables found: 1

40,000

Number of tables found: 1

29,800

Number of tables found: 1

65,000

Number of tables found: 1

50,400

Number of tables found: 1

34,800

Number of tables found: 1

35,600

Number of tables found: 1

33,200

Number of tables found: 1

51,200

Number of tables found: 1

47,600

Number of tables found: 1

56,800

Number of tables found: 1

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geo2021A0011M6Pstat4 geo2021A0011M6Pstat4gen1" title="2021A0011M6P - Median
total income in 2020 among recipients ($) - Rates - Total"> 48,000
Number of tables found: 1
geo2021A0011M9Pstat4 geo2021A0011M9Pstat4gen1" title="2021A0011M9P - Median
total income in 2020 among recipients ($) - Rates - Total"> 41,200
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1R
geo2021A0011M1Rstat4 geo2021A0011M1Rstat4gen1" title="2021A0011M1R - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M2R
geo2021A0011M2Rstat4 geo2021A0011M2Rstat4gen1" title="2021A0011M2R - Median
total income in 2020 among recipients ($) - Rates - Total"> 33,600
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4R
geo2021A0011M4Rstat4 geo2021A0011M4Rstat4gen1" title="2021A0011M4R - Median
total income in 2020 among recipients ($) - Rates - Total"> 58,400
Number of tables found: 1
geo2021A0011M5Rstat4 geo2021A0011M5Rstat4gen1" title="2021A0011M5R - Median
total income in 2020 among recipients ($) - Rates - Total"> 54,000
Number of tables found: 1
geo2021A0011M6Rstat4 geo2021A0011M6Rstat4gen1" title="2021A0011M6R - Median
total income in 2020 among recipients ($) - Rates - Total"> 53,200
Number of tables found: 0
No tables found on this page.
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M9R
geo2021A0011M9Rstat4 geo2021A0011M9Rstat4gen1" title="2021A0011M9R - Median
total income in 2020 among recipients ($) - Rates - Total"> 36,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1S
geo2021A0011M1Sstat4 geo2021A0011M1Sstat4gen1" title="2021A0011M1S - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,400
Number of tables found: 1
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geo2021A0011M4Sstat4 geo2021A0011M4Sstat4gen1" title="2021A0011M4S - Median
total income in 2020 among recipients ($) - Rates - Total"> 54,800
Number of tables found: 1
geo2021A0011M5Sstat4 geo2021A0011M5Sstat4gen1" title="2021A0011M5S - Median
total income in 2020 among recipients ($) - Rates - Total"> 42,000
Number of tables found: 1
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geo2021A0011M6Sstat4 geo2021A0011M6Sstat4gen1" title="2021A0011M6S - Median

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total income in 2020 among recipients ($) - Rates - Total"> 56,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1T
geo2021A0011M1Tstat4 geo2021A0011M1Tstat4gen1" title="2021A0011M1T - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,600
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geo2021A0011M4Tstat4 geo2021A0011M4Tstat4gen1" title="2021A0011M4T - Median
total income in 2020 among recipients ($) - Rates - Total"> 67,500
Number of tables found: 1
geo2021A0011M5Tstat4 geo2021A0011M5Tstat4gen1" title="2021A0011M5T - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,600
Number of tables found: 1
geo2021A0011M1Vstat4 geo2021A0011M1Vstat4gen1" title="2021A0011M1V - Median
total income in 2020 among recipients ($) - Rates - Total"> 28,800
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4V
geo2021A0011M4Vstat4 geo2021A0011M4Vstat4gen1" title="2021A0011M4V - Median
total income in 2020 among recipients ($) - Rates - Total"> 62,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M5V
geo2021A0011M5Vstat4 geo2021A0011M5Vstat4gen1" title="2021A0011M5V - Median
total income in 2020 among recipients ($) - Rates - Total"> 63,200
Number of tables found: 1
geo2021A0011M8Vstat4 geo2021A0011M8Vstat4gen1" title="2021A0011M8V - Median
total income in 2020 among recipients ($) - Rates - Total"> 45,600
Number of tables found: 1
geo2021A0011M9Vstat4 geo2021A0011M9Vstat4gen1" title="2021A0011M9V - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,000
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1W
geo2021A0011M1Wstat4 geo2021A0011M1Wstat4gen1" title="2021A0011M1W - Median
total income in 2020 among recipients ($) - Rates - Total"> 31,400
Number of tables found: 1
geo2021A0011M4Wstat4 geo2021A0011M4Wstat4gen1" title="2021A0011M4W - Median
total income in 2020 among recipients ($) - Rates - Total"> 62,400
Number of tables found: 0
No tables found on this page.
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M8W
geo2021A0011M8Wstat4 geo2021A0011M8Wstat4gen1" title="2021A0011M8W - Median
total income in 2020 among recipients ($) - Rates - Total"> 45,200
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Number of tables found: 1

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<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M9W
geo2021A0011M9Wstat4 geo2021A0011M9Wstat4gen1" title="2021A0011M9W - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M1X
geo2021A0011M1Xstat4 geo2021A0011M1Xstat4gen1" title="2021A0011M1X - Median
total income in 2020 among recipients ($) - Rates - Total"> 34,400
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M4X
geo2021A0011M4Xstat4 geo2021A0011M4Xstat4gen1" title="2021A0011M4X - Median
total income in 2020 among recipients ($) - Rates - Total"> 33,600
Number of tables found: 0
No tables found on this page.
Number of tables found: 1
<td class="text-right text-nowrap" headers="rh7 r113 geo2021A0011M8X
geo2021A0011M8Xstat4 geo2021A0011M8Xstat4gen1" title="2021A0011M8X - Median
total income in 2020 among recipients ($) - Rates - Total"> 68,000
Number of tables found: 0
No tables found on this page.
Number of tables found: 1
geo2021A0011M8Ystat4 geo2021A0011M8Ystat4gen1" title="2021A0011M8Y - Median
total income in 2020 among recipients ($) - Rates - Total"> 48,000
Number of tables found: 1
geo2021A0011M8Zstat4 geo2021A0011M8Zstat4gen1" title="2021A0011M8Z - Median
total income in 2020 among recipients ($) - Rates - Total"> 51,200
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[12]: df

[40]	. 7									-
[12]:	postal_code								dat	a value
0	MSA	2021A0011M3A	-	${\tt Median}$	total	${\tt income}$	in	2020	amo	37600.0
1	M4A	2021A0011M4A	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	34800.0
2	M5A	2021A0011M5A	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	43200.0
3	M6A	2021A0011M6A	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	36000.0
4	M7A	2021A0011M7A	-	${\tt Median}$	total	${\tt income}$	in	2020	amo	NaN
	•••								•••	•••
69	M1X	2021A0011M1X	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	34400.0
70	M4X	2021A0011M4X	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	33600.0
71	M8X	2021A0011M8X	-	${\tt Median}$	${\tt total}$	${\tt income}$	in	2020	amo	68000.0
72	M8Y	2021A0011M8Y	-	${\tt Median}$	total	income	in	2020	amo	48000.0
73	M8Z	2021A0011M8Z	-	${\tt Median}$	total	${\tt income}$	in	2020	amo	51200.0

[74 rows x 3 columns]

```
[15]: # Now you can export this to a CSV file for further analysis or visulization df.to_csv('income.csv')
```

[]:[