

Introduction to Boto3

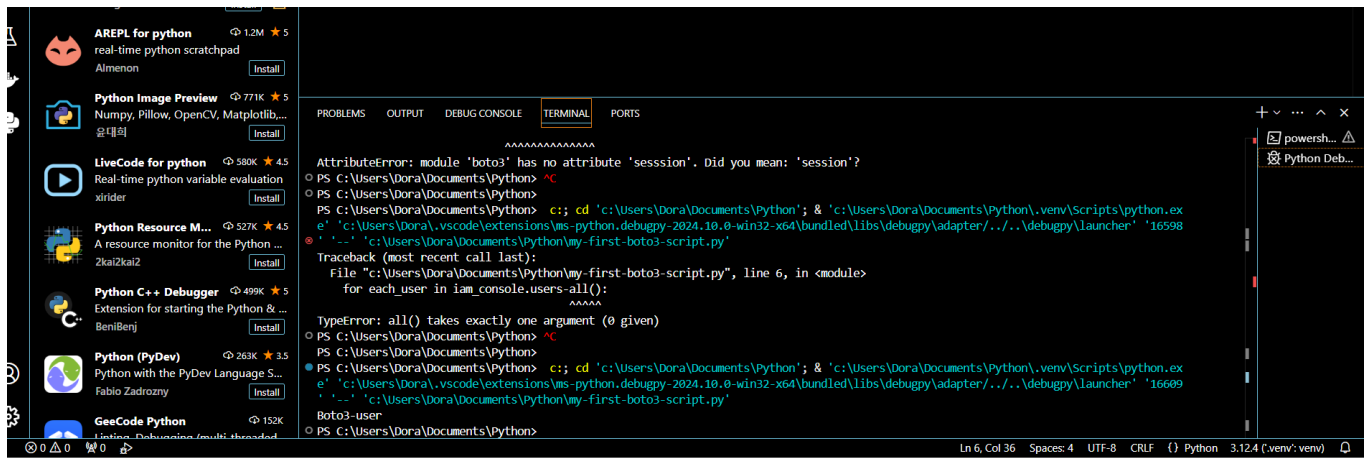
- Boto3 is the name of Python SDK/Module/Library/API for AWS
- Boto3 allows us to directly create, update and delete AWS services from our Python scripts.
- .- Boto3 is built upon botocore module.

We have to install boto3 to work with AWS services using Python scripts

```
PS C:\Users\Dora\Documents\Python> pip3 install boto3
Requirement already satisfied: boto3 in c:\users\dora\documents\python\.venv\lib\site-packages (1.35.32)
Requirement already satisfied: botocore<1.36.0,>=1.35.32 in c:\users\dora\documents\python\.venv\lib\site-packages (from boto3) (1.35.32)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in c:\users\dora\documents\python\.venv\lib\site-packages (from boto3) (1.0.1)
Requirement already satisfied: s3transfer<0.11.0,>=0.10.0 in c:\users\dora\documents\python\.venv\lib\site-packages (from boto3) (0.10.2)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in c:\users\dora\documents\python\.venv\lib\site-packages (from botocore<1.36.0,>=1.35.32->boto3) (2.9.0.post0)
Requirement already satisfied: urllib3!<2.2.0,<3,>=1.25.4 in c:\users\dora\documents\python\.venv\lib\site-packages (from botocore<1.36.0,>=1.35.32->boto3) (2.2.3)
Requirement already satisfied: six>=1.5 in c:\users\dora\documents\python\.venv\lib\site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.36.0,>=1.35.32->boto3) (1.16.0)
PS C:\Users\Dora\Documents\Python>
```

AWS CLI is a unified tool to manage your AWS service

First we have to configure AWS CLI



The screenshot shows a VS Code editor with a Python file named `iam_list_users.py`. The script imports `boto3` and `boto3.session`, then creates an IAM console client and calls `list_users()` to retrieve a list of users. The terminal output shows the command being executed and the resulting JSON data for a single user, `Boto3-user`.

```
1 #Import all the modules and the libraries
2 import boto3
3 import boto3.session
4
5 #Open Management Console
6 aws_management_console = boto3.session.Session(profile_name="default")
7 #Open IAM console
8 iam_console = aws_management_console.client(service_name = "iam")
9 result = iam_console.list_users()
10 print(result)
11
```

```
PS C:\Users\Dora\Documents\Python> & 'c:\Users\Dora\Documents\Python\.venv\Scripts\python.exe' 'c:\Users\Dora\.vscode\extensions\ms-py
thon.debugpy-2024.10.0-win32-x64\bundled\libs\debugpy\adapter\..\..\debugpy\launcher' '23111' '--' 'c:\Users\Dora\Documents\Python\my
-first-boto3-script.py'
Boto3-user
PS C:\Users\Dora\Documents\Python> code iam_list_users.py
PS C:\Users\Dora\Documents\Python> ^C
PS C:\Users\Dora\Documents\Python>
PS C:\Users\Dora\Documents\Python> c; cd 'c:\Users\Dora\Documents\Python'; & 'c:\Users\Dora\Documents\Python\.venv\Scripts\python.ex
e' 'c:\Users\Dora\.vscode\extensions\ms-python.debugpy-2024.10.0-win32-x64\bundled\libs\debugpy\adapter\..\..\debugpy\launcher' '23207
' '--' 'c:\Users\Dora\Documents\Python\iam_list_users.py'
{'Users': [{'Path': '/', 'UserName': 'Boto3-user', 'UserId': 'AIDAGGBMAR2DAJFS0760F', 'Arn': 'arn:aws:iam::975049887366:user/Boto3-use
r', 'CreateDate': datetime.datetime(2024, 10, 3, 14, 43, 30, tzinfo=tzutc())}], 'IsTruncated': False, 'ResponseMetadata': {'RequestId'
: '5ba4d06b-deb5-4ec6-b737-cab81f293feb', 'HTTPStatusCode': 200, 'HTTPHeaders': {'date': 'Fri, 04 Oct 2024 12:50:12 GMT', 'x-amzn-requ
estid': '5ba4d06b-deb5-4ec6-b737-cab81f293feb', 'content-type': 'text/xml', 'content-length': '557', 'RetryAttempts': 0}}
PS C:\Users\Dora\Documents\Python> ]
```

If we use pprint we get this:

The screenshot shows the same VS Code editor with the `iam_list_users.py` file. In this version, the script imports `pprint` from the `pprint` module and uses `pprint(result)` to format the output. The terminal output shows the same JSON data, but it is formatted in a more readable, pretty-printed style.

```
1 #Import all the modules and the libraries
2 import boto3
3 import boto3.session
4 from pprint import pprint
5
6 #Open Management Console
7 aws_management_console = boto3.session.Session(profile_name="default")
8 #Open IAM console
9 iam_console = aws_management_console.client(service_name = "iam")
10 result = iam_console.list_users()
11 pprint(result)
12
```

```
PS C:\Users\Dora\Documents\Python> ^C
PS C:\Users\Dora\Documents\Python>
PS C:\Users\Dora\Documents\Python> c; cd 'c:\Users\Dora\Documents\Python'; & 'c:\Users\Dora\Documents\Python\.venv\Scripts\python.ex
e' 'c:\Users\Dora\.vscode\extensions\ms-python.debugpy-2024.10.0-win32-x64\bundled\libs\debugpy\adapter\..\..\debugpy\launcher' '23251
' '--' 'c:\Users\Dora\Documents\Python\iam_list_users.py'
{'IsTruncated': False,
 'ResponseMetadata': {'HTTPHeaders': {'content-length': '557',
                                       'content-type': 'text/xml',
                                       'date': 'Fri, 04 Oct 2024 13:00:55 GMT',
                                       'x-amzn-requestid': '903ff597-5b49-47cf-8870-791bee5a5e64'},
                      'HTTPStatusCode': 200,
                      'RequestId': '903ff597-5b49-47cf-8870-791bee5a5e64',
                      'RetryAttempts': 0},
 'Users': [{'Arn': 'arn:aws:iam::975049887366:user/Boto3-user',
             'CreateDate': datetime.datetime(2024, 10, 3, 14, 43, 30, tzinfo=tzutc()),
             'Path': '/',
             'UserId': 'AIDAGGBMAR2DAJFS0760F',
             'UserName': 'Boto3-user'}]
PS C:\Users\Dora\Documents\Python> ]
```

If I want to print just users then I get output like this:

The screenshot shows the VS Code editor interface. The Explorer sidebar on the left displays a project structure with files: `.venv`, `iam_list_users.py`, `main.py`, `my-first-boto3-script.py`, and `steps.txt`. The main editor window shows the `iam_list_users.py` file with the following code:

```
1 #Import all the modules and the libraries
2 import boto3
3 import boto3.session
4 from pprint import pprint
5
6 #Open Management Console
7 aws_management_console = boto3.session.Session(profile_name="default")
8 #Open IAM console
9 iam_console = aws_management_console.client(service_name = "iam")
10 result = iam_console.list_users()
11 pprint(result['Users'])
12
```

The TERMINAL panel at the bottom shows the output of the script:

```
'HTTPStatuscode': 200,
'RequestId': '903ff597-5b49-47cf-8870-791bee5a5e64',
'RetryAttempts': 0),
'Users': [{'Arn': 'arn:aws:iam::975049887366:user/Boto3-user',
'CreateDate': datetime.datetime(2024, 10, 3, 14, 43, 30, tzinfo=tzutc()),
'Path': '/',
'UserId': 'AIDA6GBMAR2DAJFS0760F',
'UserName': 'Boto3-user'}]}
```

The status bar at the bottom indicates the file is at line 11, column 21, with 4 spaces, UTF-8 encoding, CRLF line endings, and Python 3.12.4 (venv:venv) interpreter.

The screenshot shows the VS Code editor interface with the same project structure as the first image. The main editor window shows the modified `iam_list_users.py` file:

```
4 from pprint import pprint
5
6 #Open Management Console
7 aws_management_console = boto3.session.Session(profile_name="default")
8 #Open IAM console
9 iam_console = aws_management_console.client(service_name = "iam")
10 result = iam_console.list_users()
11 for each_user in result['Users']:
12     print(each_user['UserName'])
13
```

The TERMINAL panel shows the output of the script:

```
'UserId': 'AIDA6GBMAR2DAJFS0760F',
'UserName': 'Boto3-user'}]}
```

The status bar at the bottom indicates the file is at line 11, column 21, with 4 spaces, UTF-8 encoding, CRLF line endings, and Python 3.12.4 (venv:venv) interpreter.

File Edit Selection View Go Run Terminal Help Python

EXPLORER

- PYTHON
 - .venv
 - Include
 - Lib
 - Scripts
 - pip.pyz
 - pyvenv.cfg
 - ec2.py
 - iam_list_users.py
 - main.py
 - my-first-boto3-script.py
 - steps.txt

ec2.py > ...

```
1 # List all running EC2 instances in your AWS account
2 import boto3
3 import boto3.session
4 # Open Management Console
5 aws_management_console=boto3.session.Session(profile_name="default")
6 # Open EC2 Console
7 ec2_console = aws_management_console.client(service_name="ec2")
8 # Use Boto3 Documentation to get more information
9 result = ec2_console.describe_instances()
10 print(result)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
'UserId': 'AIDA6GBMAR2DAJFSD760F',
'UserName': 'Boto3-user'}}
PS C:\Users\Dora\Documents\Python> ^C
PS C:\Users\Dora\Documents\Python> c;; cd 'c:\Users\Dora\Documents\Python'; & 'c:\Users\Dora\Documents\Python\.venv\Scripts\python.exe' 'c:\Us
ers\Dora\.vscode\extensions\ms-python.debugpy-2024.10.0-win32-x64\bundle\libs\debugpy\adapter\..\..\debugpy\launcher' '23297' '--' 'c:\Users\D
ora\Documents\Python\iam_list_users.py'
Boto3-user
PS C:\Users\Dora\Documents\Python> code ec2.py
PS C:\Users\Dora\Documents\Python> ^C
PS C:\Users\Dora\Documents\Python>
PS C:\Users\Dora\Documents\Python> c;; cd 'c:\Users\Dora\Documents\Python'; & 'c:\Users\Dora\Documents\Python\.venv\Scripts\python.exe' 'c:\Us
ers\Dora\.vscode\extensions\ms-python.debugpy-2024.10.0-win32-x64\bundle\libs\debugpy\adapter\..\..\debugpy\launcher' '23766' '--' 'c:\Users\D
ora\Documents\Python\ec2.py'
{'Reservations': [], 'ResponseMetadata': {'RequestId': 'c6ed94ec-1ef2-4197-95d3-a83001154125', 'HTTPStatusCode': 200, 'HTTPHeaders': {'x-amzn-r
equestid': 'c6ed94ec-1ef2-4197-95d3-a83001154125', 'cache-control': 'no-cache, no-store', 'strict-transport-security': 'max-age=31536000; inclu
desubdomains', 'content-type': 'text/xml; charset=UTF-8', 'content-length': '219', 'date': 'Fri, 04 Oct 2024 14:11:07 GMT', 'server': 'AmazonEC2
'}, 'RetryAttempts': 0}}
```