Hands on Live Session: Build and Deploy an ML model using AWS and APIs.

Steps:

1. Build a model on your local box (Amazon Fine Food reviews) and store the model and other key model related variables in .pkl files
2. Launch a micro instance on AWS.
3. Connect to the AWS box [ssh]
4. Move the files to an AWS EC2 instance/box [scp]
5. Install all packages needed on the AWS box.
6. Run app.py on the AWS box.
7. Check the output in the browser.

Software needed:

1. Anaconda:
    a. **Windows 64 bit:** https://repo.continuum.io/archive/Anaconda3-5.2.0-Windows-x86_64.exe
    b. **Windows 32 bit:** https://repo.continuum.io/archive/Anaconda3-5.2.0-Windows-x86.exe
    c. **Mac :** https://repo.continuum.io/archive/Anaconda3-5.2.0-MacOSX-x86_64.sh
    d. **Linux 64 bit:** https://repo.continuum.io/archive/Anaconda3-5.2.0-Linux-x86_64.sh
    e. **Linux 32 bit:** https://repo.continuum.io/archive/Anaconda3-5.2.0-Linux-x86.sh
    f. **Check the previous Archives of Anaconda:** https://repo.continuum.io/archive/

2. Packages needed:

1. pip3
2. pandas
3. numpy
4. sklearn
5. beautifulsoup4
6. lxml
7. flask
8. re

you can copy all these packages and try like this:
https://stackoverflow.com/a/15593865/4084039

[1] Code on local box

Download code:

https://drive.google.com/file/d/15E1oFiBMO_UTGZuqydF0Gu9yMC0UC9Lq/view?usp=sharing

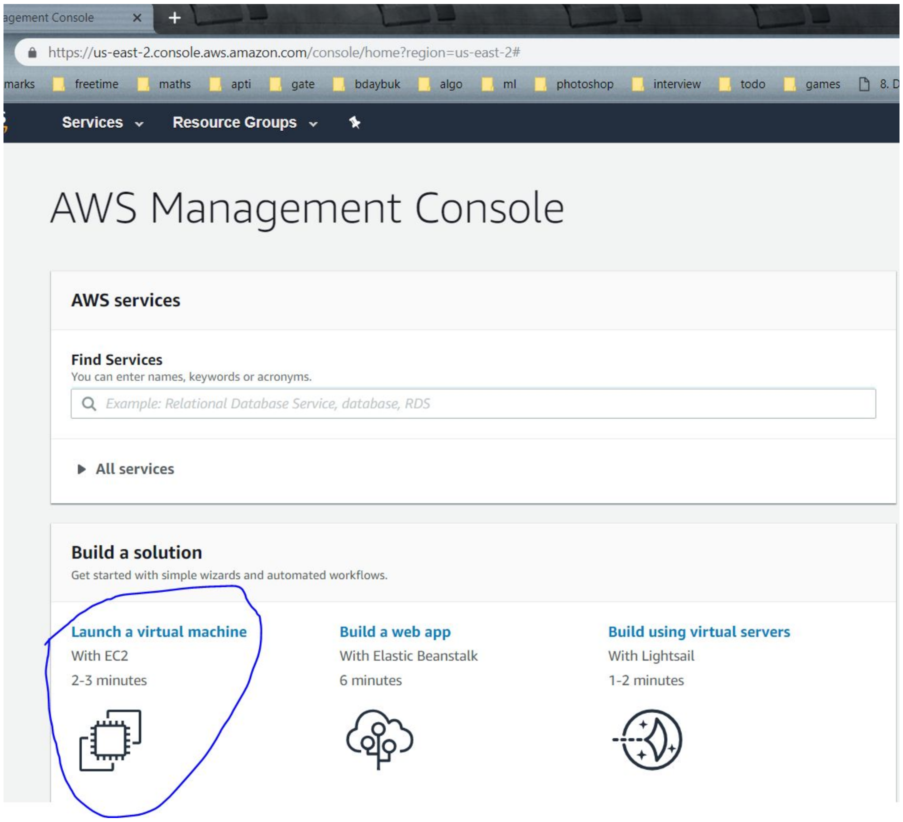
Anaconda Prompt:

1. Change to the code directory.
2. Run “python3 app.py”
3. Browser: http://localhost:8080/index

[2] Launch a micro instance on AWS.

Creating an instance:

1. Create an AWS account https://aws.amazon.com, https://portal.aws.amazon.com/billing/signup#/start
2. Login: https://console.aws.amazon.com
   After login:


agement Console
https://us-east-2.console.aws.amazon.com/console/home?region=us-east-2#
marks
freetime
maths
apti
gate
bdaybuk
algo
ml
photoshop
interview
todo
games
8. D
Services
Resource Groups

AWS Management Console

AWS services

Find Services

You can enter names, keywords or acronyms.

Example: Relational Database Service, database, RDS
All services

Build a solution

Get started with simple wizards and automated workflows.

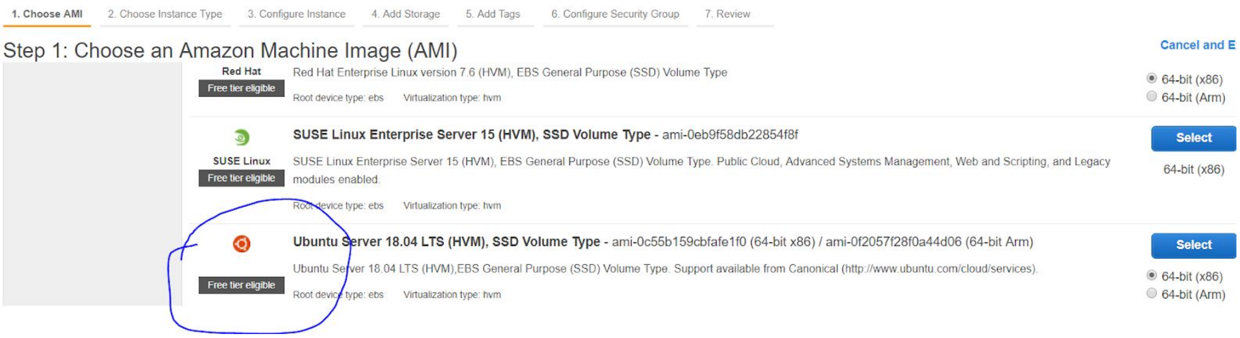
Launch a virtual machine
With EC2
2-3 minutes

Build a web app
With Elastic Beanstalk
6 minutes

Build using virtual servers
With Lightsail
1-2 minutes

Launch the EC2 instance

3. Choose the ubuntu free tire



Step 1: Choose an Amazon Machine Image (AMI)

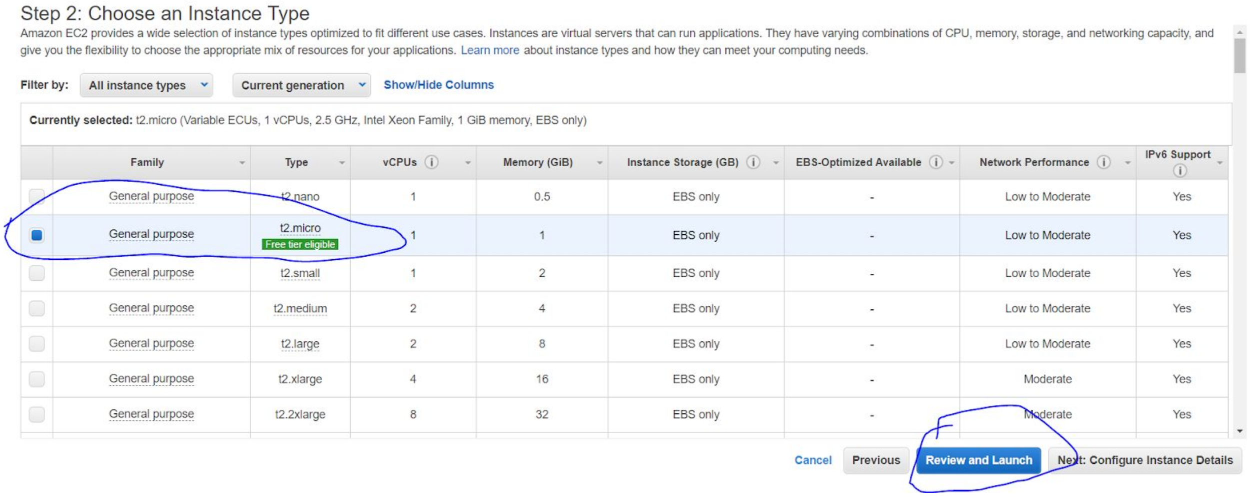
Red Hat
Free tier eligible
Red Hat Enterprise Linux version 7.6 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs   Virtualization type: hvm
● 64-bit (x86)
○ 64-bit (Arm)

SUSE Linux
Free tier eligible
SUSE Linux Enterprise Server 15 (HVM), SSD Volume Type - ami-0eb9f58db22854f8f
SUSE Linux Enterprise Server 15 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.
Root device type: ebs   Virtualization type: hvm
Select
64-bit (x86)

Free tier eligible
Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-0c55b159cbfafe1f0 (64-bit x86) / ami-0f2057f28f0a44d06 (64-bit Arm)
Ubuntu Server 18.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Root device type: ebs   Virtualization type: hvm
Select
● 64-bit (x86)
○ 64-bit (Arm)

Click on select

4. Choose t2.micro free tier eligible



Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.

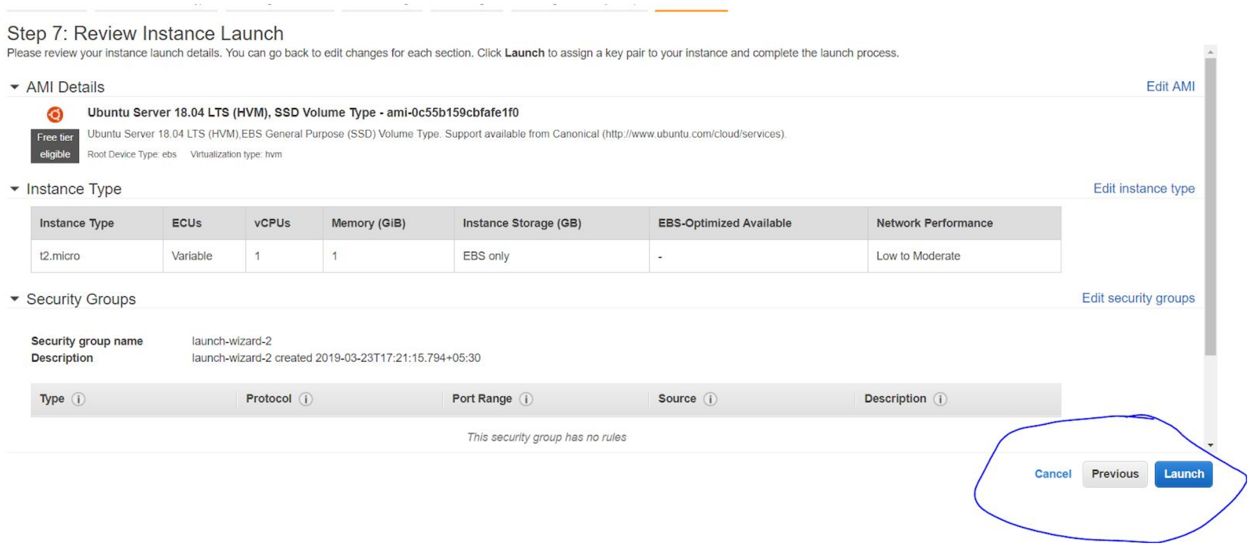
Filter by: All instance types · Current generation · Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
☐	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
☑	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
☐	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes

Click on review and launch

5.



Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

AMI Details

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-0c55b159cbfafe1f0

Ubuntu Server 18.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).

Root Device Type: ebs Virtualization type: hvm

Instance Type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

Security Groups

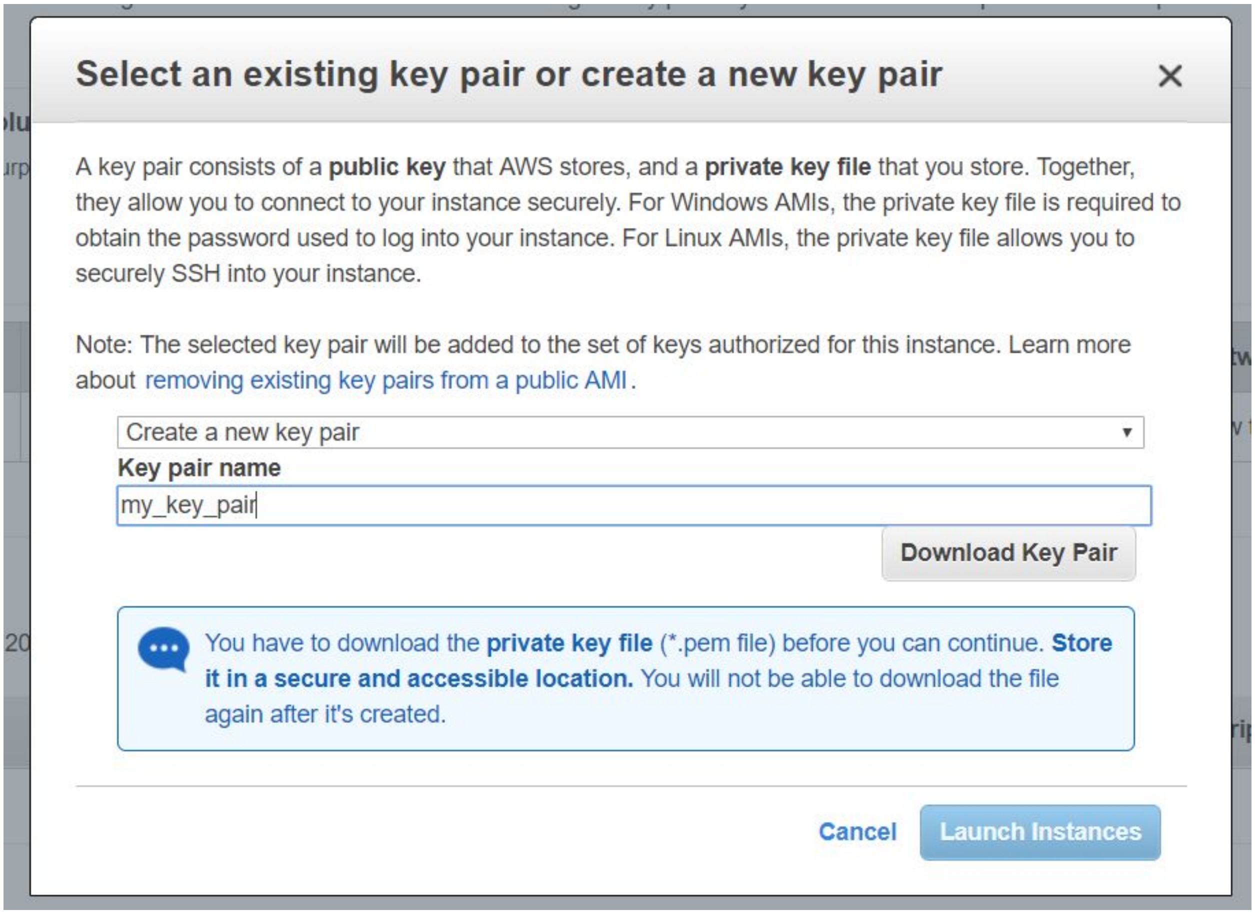
Security group name launch-wizard-2

Description launch-wizard-2 created 2019-03-23T17:21:15.794+05:30

Type	Protocol	Port Range	Source	Description
This security group has no rules				

Click on launch

6.



Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI .

Create a new key pair

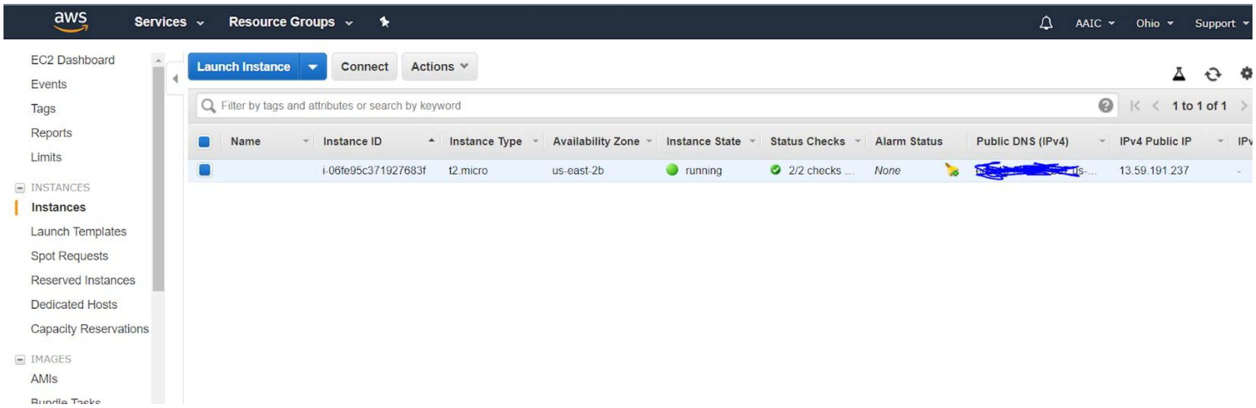
Key pair name

my_key_pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Click on “Download Key Pair” and save the .pem file then click on “Launch Instance”

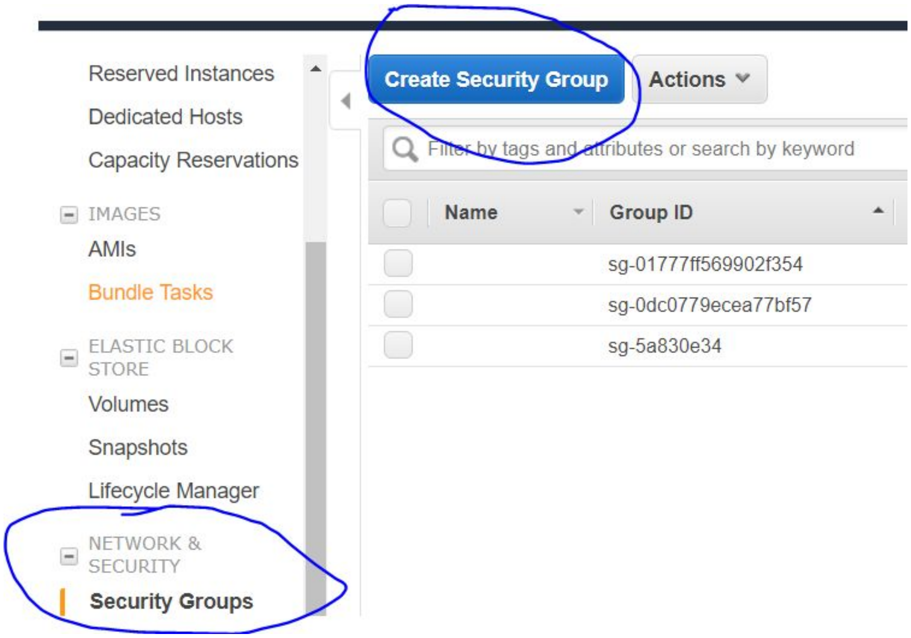
7.



	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv
■		i-06fe95c371927683f	t2.micro	us-east-2b	● running	✓ 2/2 checks ...	None	[redacted]	13.59.191.237	-

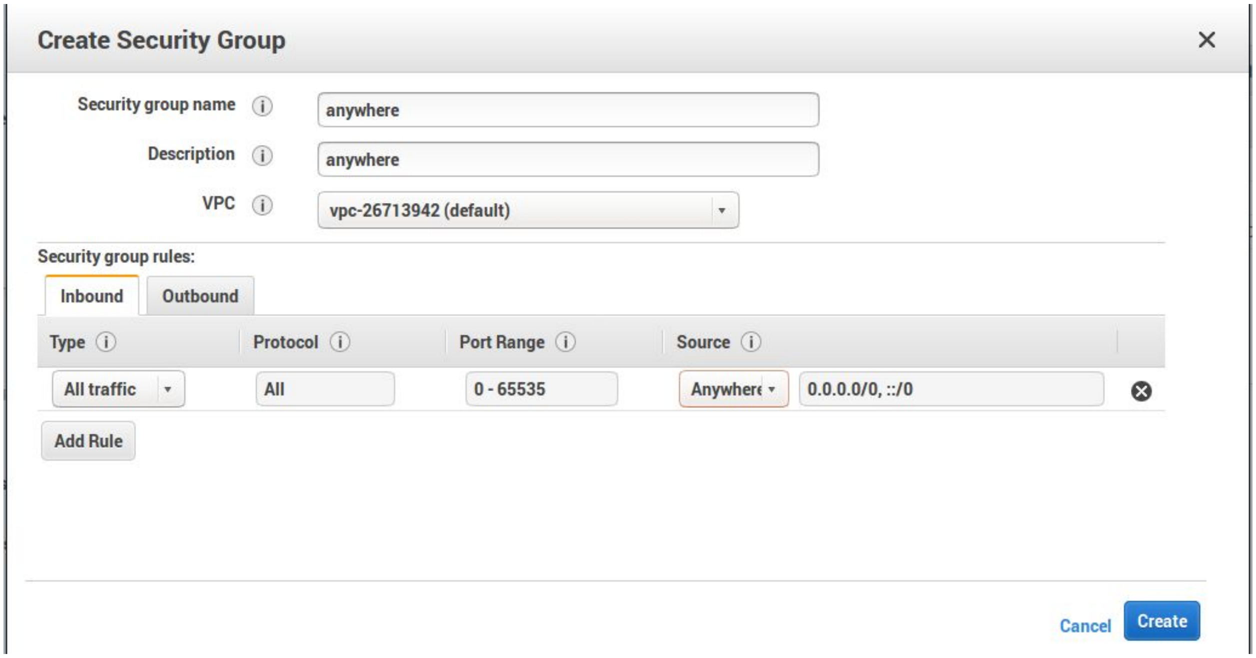
You will see this screen, you have successfully launched the an EC2 instance, now we need to launch an flask api in it

8. Final step:



	Name	Group ID
□		sg-01777ff569902f354
□		sg-0dc0779ecea77bf57
□		sg-5a830e34

Select the “Network & security” -> Security groups and then click “Create Security Group”



Create Security Group

Security group name: anywhere

Description: anywhere

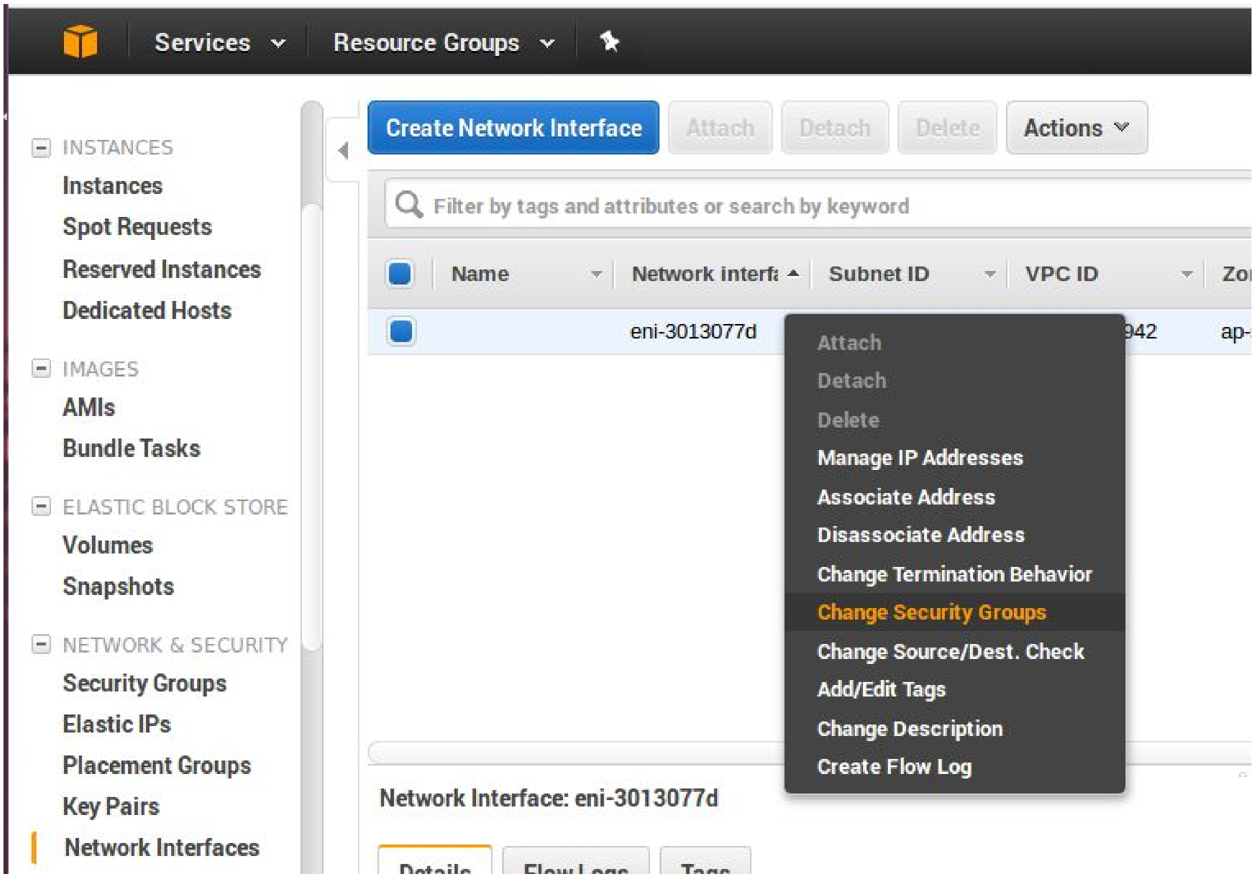
VPC: vpc-26713942 (default)

Security group rules:

Inbound | Outbound

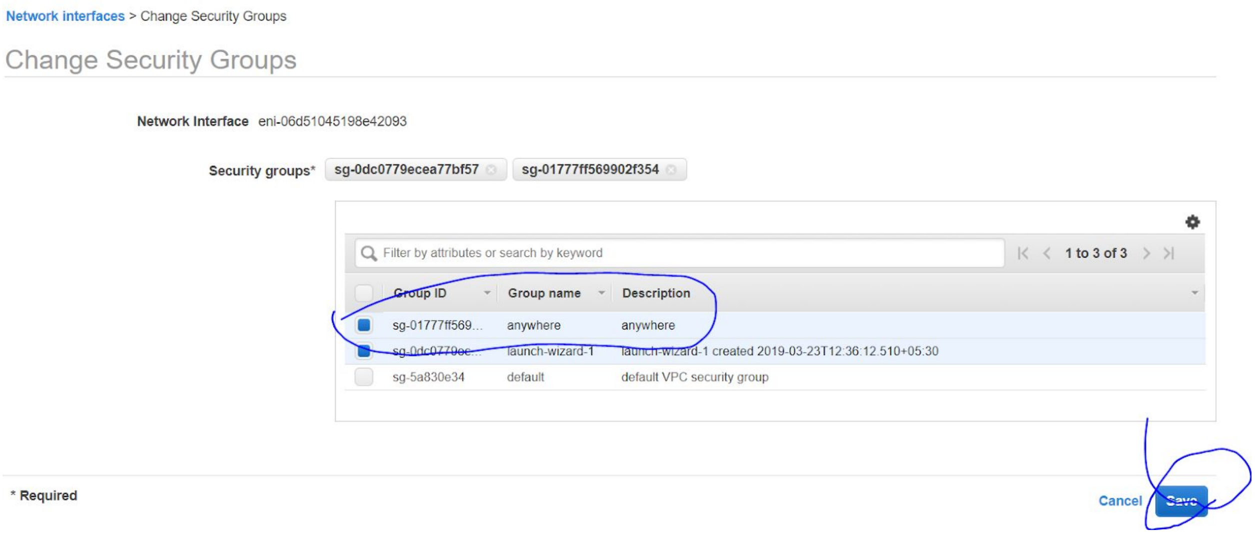
Type	Protocol	Port Range	Source	
All traffic	All	0 - 65535	Anywhere	0.0.0.0/0, ::/0

Then add the specific security group to **network interface**



Name	Network interfa	Subnet ID	VPC ID	Zo
	eni-3013077d		942	ap-

Network Interface: eni-3013077d



Network interfaces > Change Security Groups

Change Security Groups

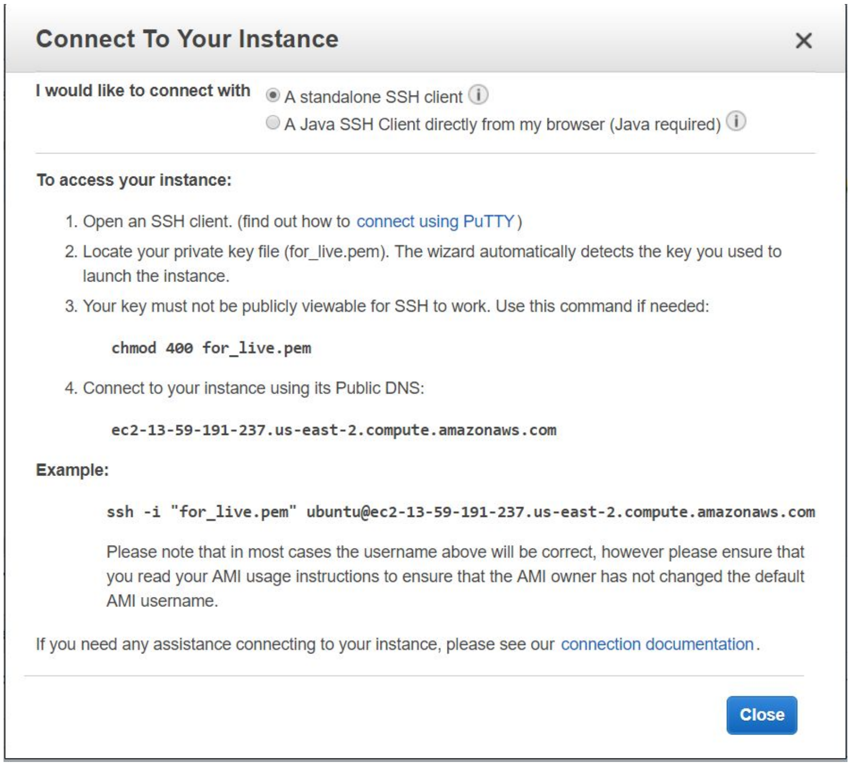
Network Interface eni-06d51045198e42093

Security groups* sg-0dc0779ecea77bf57 sg-01777ff569902f354

	Group ID	Group name	Description
☑	sg-01777ff569...	anywhere	anywhere
☑	sg-0dc0779ec...	launch-wizard-1	launch-wizard-1 created 2019-03-23T12:36:12.510+05:30
☐	sg-5a830e34	default	default VPC security group

* Required

[3] Connect to the AWS box



Connect To Your Instance

I would like to connect with ● A standalone SSH client ○ A Java SSH Client directly from my browser (Java required)

To access your instance:

1. Open an SSH client. (find out how to connect using PuTTY)
2. Locate your private key file (for_live.pem). The wizard automatically detects the key you used to launch the instance.
3. Your key must not be publicly viewable for SSH to work. Use this command if needed:

```
chmod 400 for_live.pem
```

4. Connect to your instance using its Public DNS:

```
ec2-13-59-191-237.us-east-2.compute.amazonaws.com
```

Example:

```
ssh -i "for_live.pem" ubuntu@ec2-13-59-191-237.us-east-2.compute.amazonaws.com
```

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our connection documentation.

[4] Move the files to an AWS EC2 instance/box []

Command line to copy files

```
C:\Users\Asus\OneDrive\Desktop>scp -r -i "for_live.pem" ./AFR
ubuntu@ec2-13-59-191-237.us-east-2.compute.amazonaws.com:~/

app.py                                      100% 3863     3.8KB/s   00:00
count_vect.pkl                              100%  787KB 786.7KB/s   00:01
database.sqlite                             100%  356MB   5.6MB/s   01:03
model.pkl                                   100%  144KB 143.7KB/s   00:00
model.py                                    100% 4864     4.8KB/s   00:00
index.html                                  100%  332     0.3KB/s   00:00
```

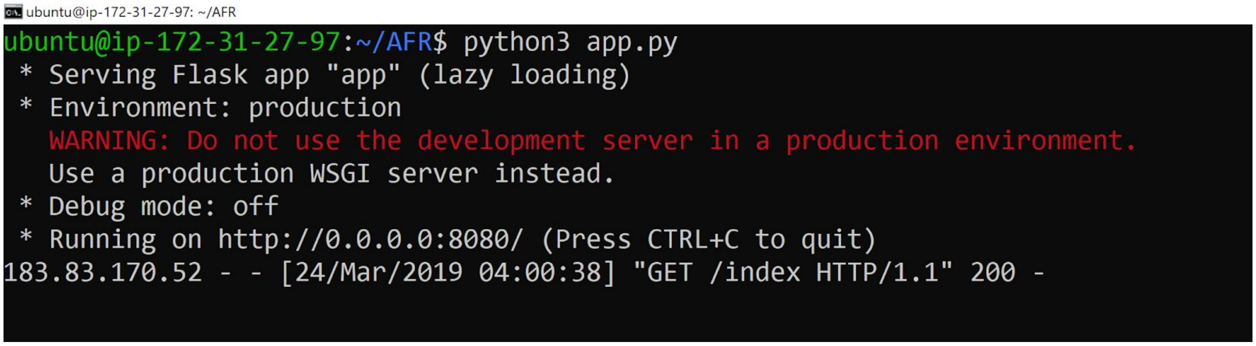
[5] Install all packages needed on the AWS box.

```
sudo apt-get install python3-pip
pip3 install <each of the following packages>
```

Packages needed:

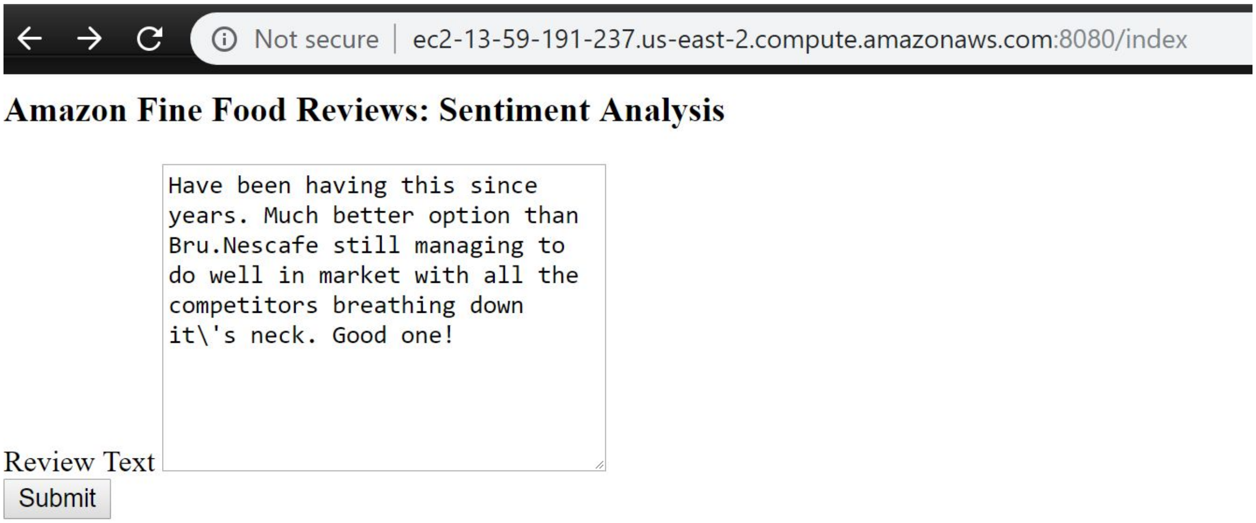
- pip3
- pandas
- numpy
- sklearn
- beautifulsoup4
- lxml
- flask
- re

[6] Run app.py on the AWS box.



```
ubuntu@ip-172-31-27-97:~/AFR$ python3 app.py
 * Serving Flask app "app" (lazy loading)
 * Environment: production
   WARNING: Do not use the development server in a production environment.
   Use a production WSGI server instead.
 * Debug mode: off
 * Running on http://0.0.0.0:8080/ (Press CTRL+C to quit)
183.83.170.52 - - [24/Mar/2019 04:00:38] "GET /index HTTP/1.1" 200 -
```

[8] Check the output in the browser.


Not secure
ec2-13-59-191-237.us-east-2.compute.amazonaws.com:8080/index

Amazon Fine Food Reviews: Sentiment Analysis

Review Text: Have been having this since years. Much better option than Bru.Nescafe still managing to do well in market with all the competitors breathing down it\'s neck. Good one!