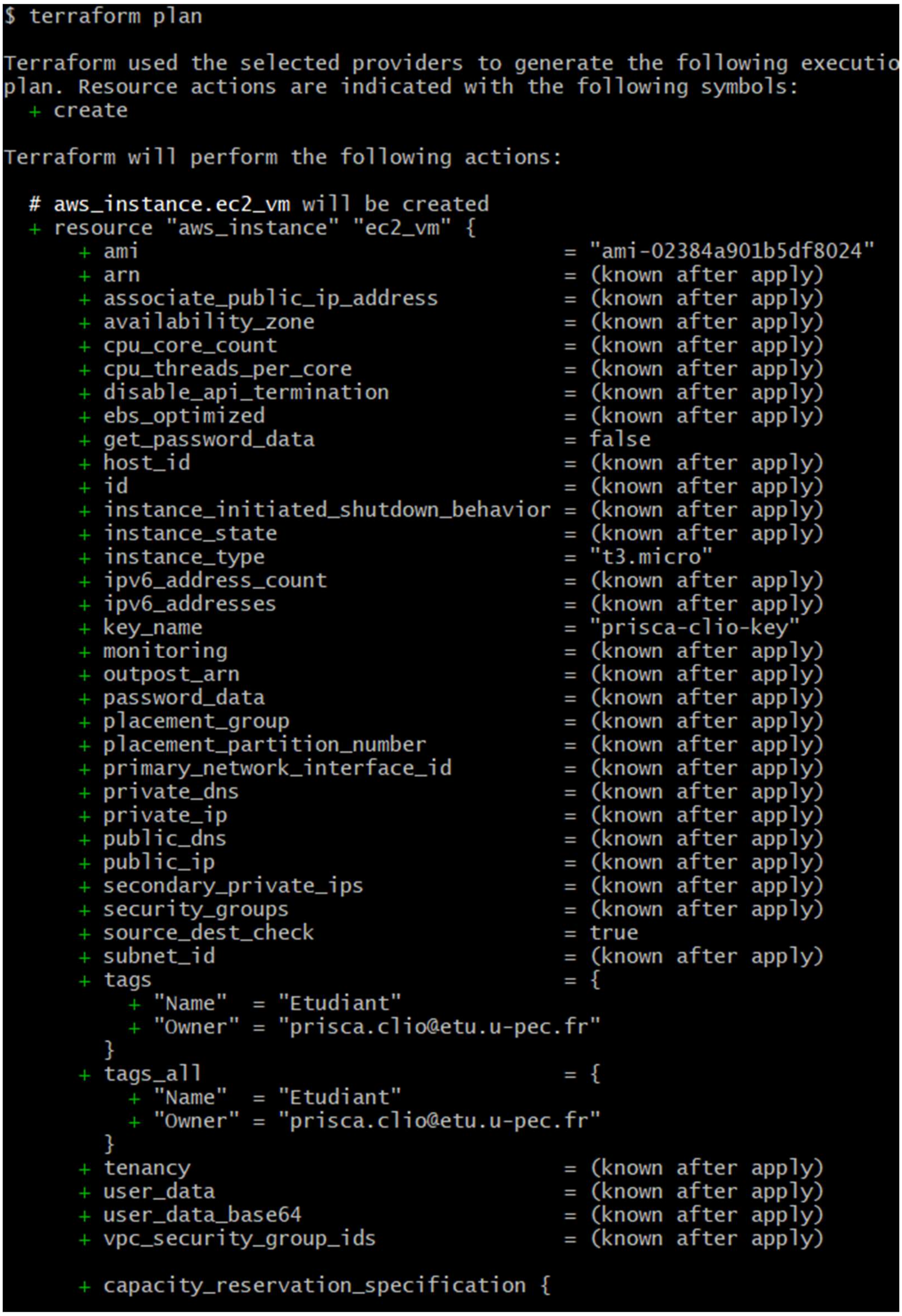
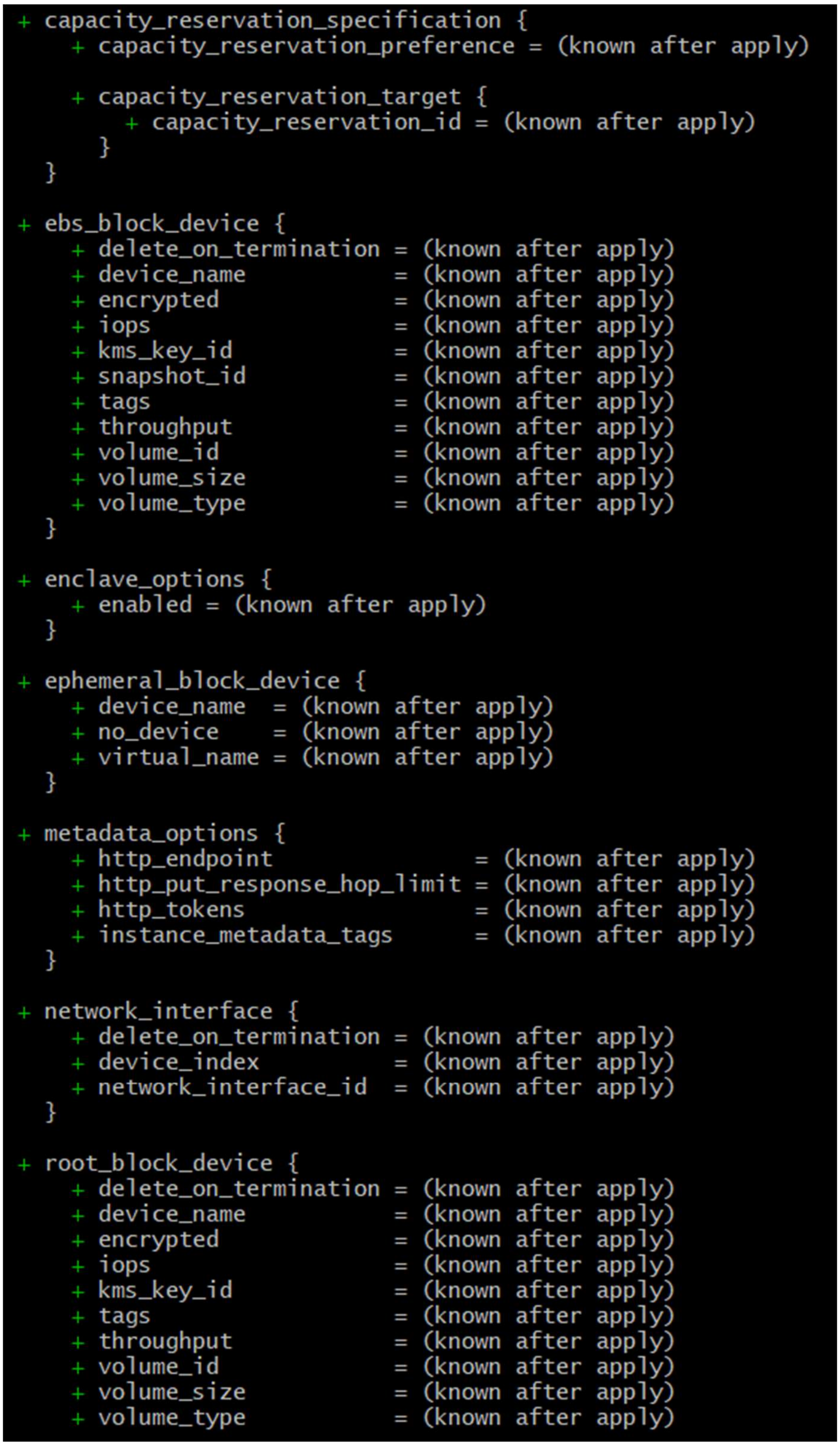
CC de data pipeline :

Question 1)
La région Stockholm sur AWS -> eu-north-1

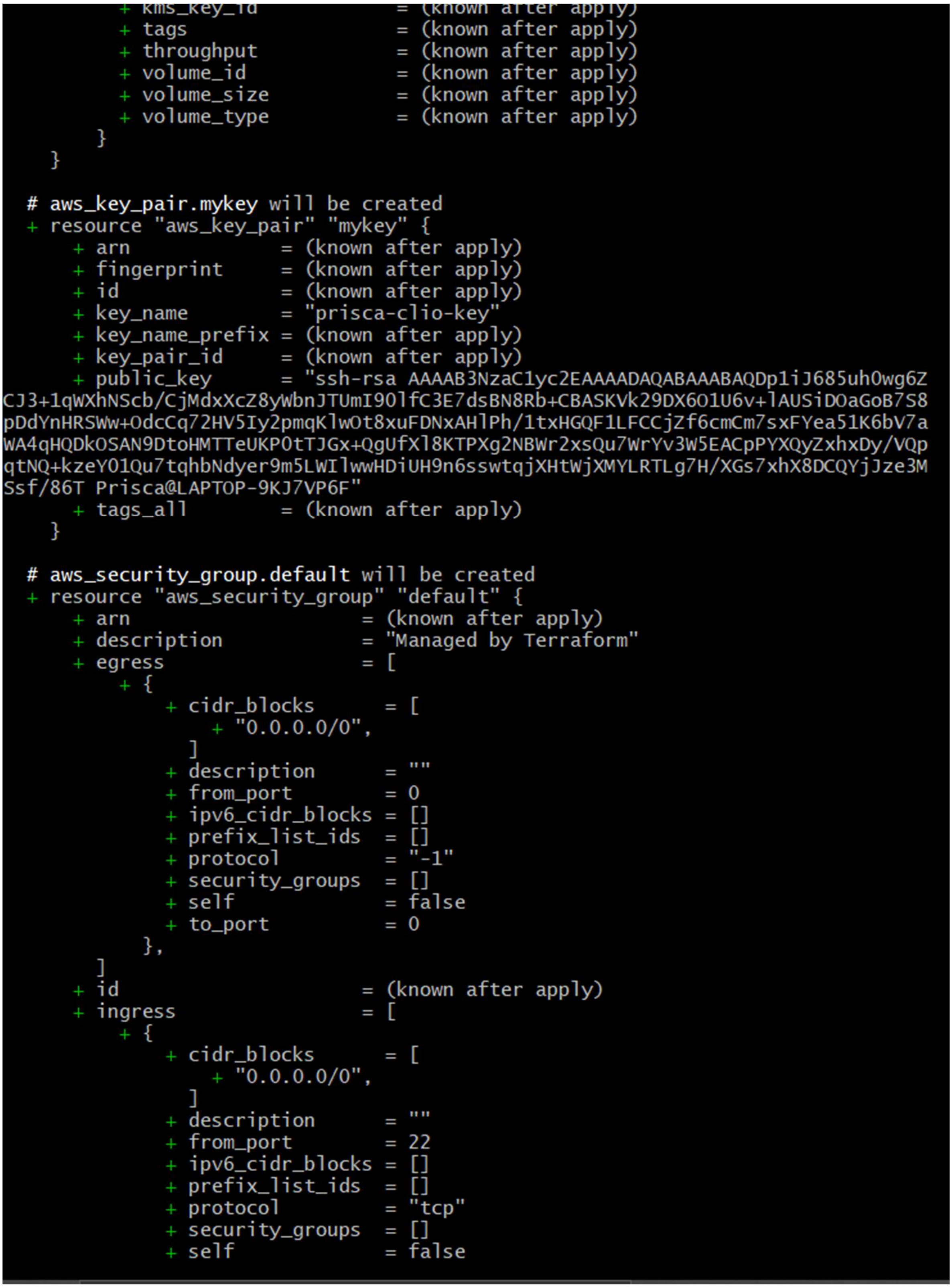
Terraaform plan :



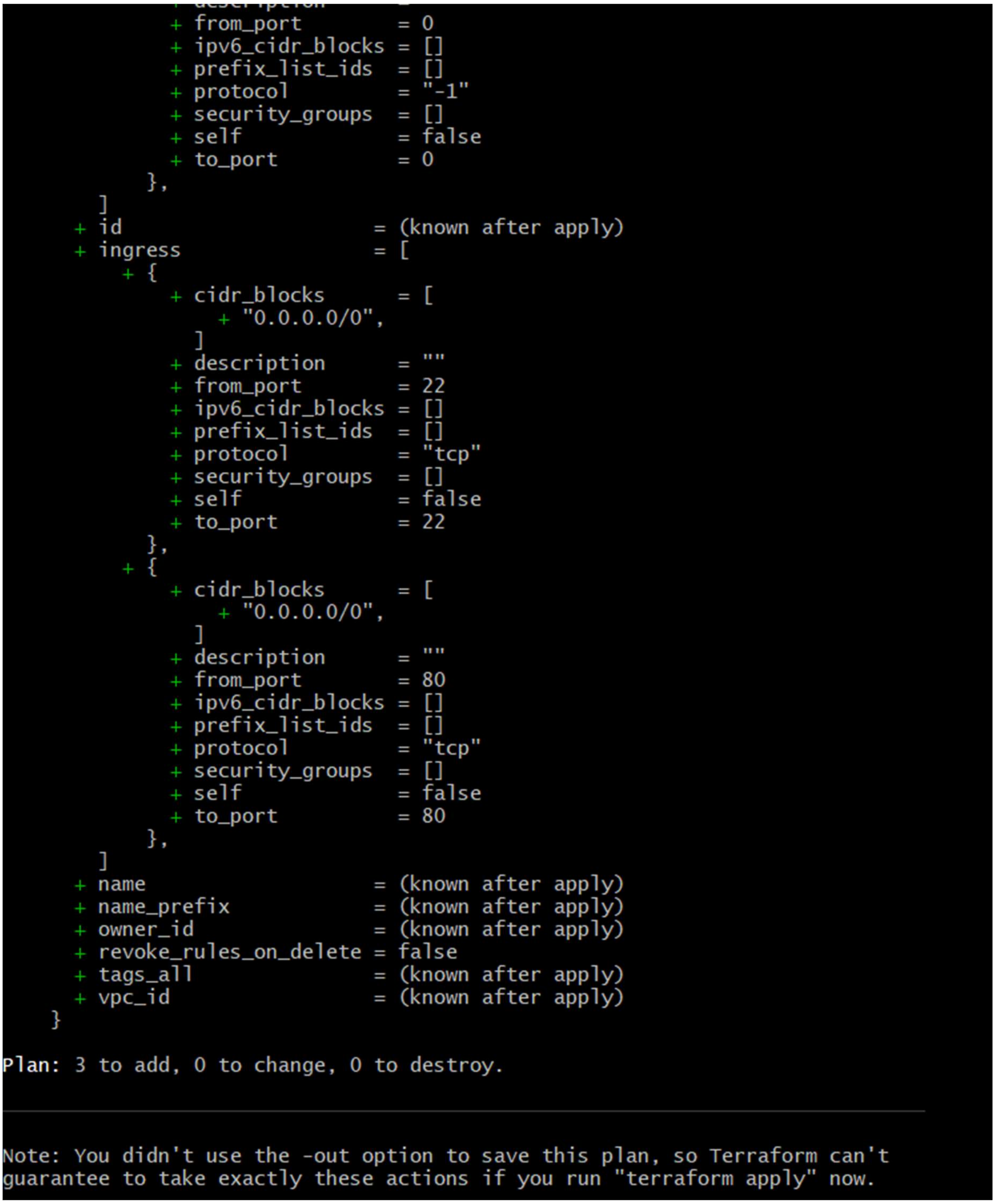
```
$ terraform plan

Terraform used the selected providers to generate the following executio
plan. Resource actions are indicated with the following symbols:
  + create

Terraform will perform the following actions:

  # aws_instance.ec2_vm will be created
  + resource "aws_instance" "ec2_vm" {
      + ami                                  = "ami-02384a901b5df8024"
      + arn                                  = (known after apply)
      + associate_public_ip_address          = (known after apply)
      + availability_zone                    = (known after apply)
      + cpu_core_count                       = (known after apply)
      + cpu_threads_per_core                 = (known after apply)
      + disable_api_termination              = (known after apply)
      + ebs_optimized                        = (known after apply)
      + get_password_data                    = false
      + host_id                              = (known after apply)
      + id                                   = (known after apply)
      + instance_initiated_shutdown_behavior = (known after apply)
      + instance_state                       = (known after apply)
      + instance_type                        = "t3.micro"
      + ipv6_address_count                   = (known after apply)
      + ipv6_addresses                       = (known after apply)
      + key_name                             = "prisca-clio-key"
      + monitoring                           = (known after apply)
      + outpost_arn                          = (known after apply)
      + password_data                        = (known after apply)
      + placement_group                      = (known after apply)
      + placement_partition_number           = (known after apply)
      + primary_network_interface_id         = (known after apply)
      + private_dns                          = (known after apply)
      + private_ip                           = (known after apply)
      + public_dns                           = (known after apply)
      + public_ip                            = (known after apply)
      + secondary_private_ips                = (known after apply)
      + security_groups                      = (known after apply)
      + source_dest_check                    = true
      + subnet_id                            = (known after apply)
      + tags                                 = {
          + "Name"  = "Etudiant"
          + "Owner" = "prisca.clio@etu.u-pec.fr"
        }
      + tags_all                             = {
          + "Name"  = "Etudiant"
          + "Owner" = "prisca.clio@etu.u-pec.fr"
        }
      + tenancy                              = (known after apply)
      + user_data                            = (known after apply)
      + user_data_base64                     = (known after apply)
      + vpc_security_group_ids               = (known after apply)

      + capacity_reservation_specification {
```



```
+ capacity_reservation_specification {
    + capacity_reservation_preference = (known after apply)

    + capacity_reservation_target {
        + capacity_reservation_id = (known after apply)
      }
  }

+ ebs_block_device {
    + delete_on_termination = (known after apply)
    + device_name           = (known after apply)
    + encrypted             = (known after apply)
    + iops                  = (known after apply)
    + kms_key_id            = (known after apply)
    + snapshot_id           = (known after apply)
    + tags                  = (known after apply)
    + throughput            = (known after apply)
    + volume_id             = (known after apply)
    + volume_size           = (known after apply)
    + volume_type           = (known after apply)
  }

+ enclave_options {
    + enabled = (known after apply)
  }

+ ephemeral_block_device {
    + device_name  = (known after apply)
    + no_device    = (known after apply)
    + virtual_name = (known after apply)
  }

+ metadata_options {
    + http_endpoint               = (known after apply)
    + http_put_response_hop_limit = (known after apply)
    + http_tokens                 = (known after apply)
    + instance_metadata_tags      = (known after apply)
  }

+ network_interface {
    + delete_on_termination = (known after apply)
    + device_index          = (known after apply)
    + network_interface_id  = (known after apply)
  }

+ root_block_device {
    + delete_on_termination = (known after apply)
    + device_name           = (known after apply)
    + encrypted             = (known after apply)
    + iops                  = (known after apply)
    + kms_key_id            = (known after apply)
    + tags                  = (known after apply)
    + throughput            = (known after apply)
    + volume_id             = (known after apply)
    + volume_size           = (known after apply)
    + volume_type           = (known after apply)
```

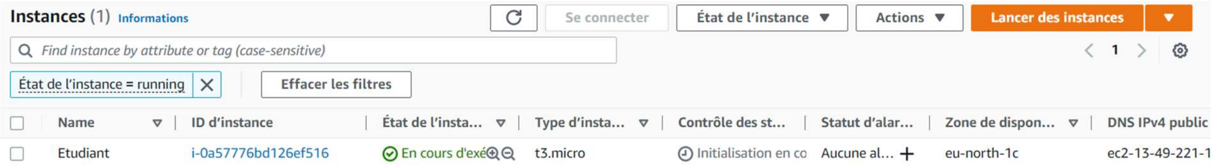


```
          + kms_key_id            = (known after apply)
          + tags                  = (known after apply)
          + throughput            = (known after apply)
          + volume_id             = (known after apply)
          + volume_size           = (known after apply)
          + volume_type           = (known after apply)
        }
    }

  # aws_key_pair.mykey will be created
  + resource "aws_key_pair" "mykey" {
      + arn             = (known after apply)
      + fingerprint     = (known after apply)
      + id              = (known after apply)
      + key_name        = "prisca-clio-key"
      + key_name_prefix = (known after apply)
      + key_pair_id     = (known after apply)
      + public_key      = "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDp1iJ685uh0wg6Z
CJ3+1qWXhNScb/CjMdxXcZ8yWbnJTUmI90lfC3E7dsBN8Rb+CBASKVk29DX6O1U6v+lAUSiDOaGoB7S8
pDdYnHRSWw+OdcCq72HV5Iy2pmqKlwOt8xuFDNxAHlPh/1txHGQF1LFCCjZf6cmCm7sxFYea51K6bV7a
WA4qHQDkOSAN9DtoHMTTeUKP0tTJGx+QgUfXl8KTPXg2NBWr2xsQu7WrYv3W5EACpPYXQyZxhxDy/VQp
qtNQ+kzeY01Qu7tqhbNdyer9m5LWIlwwHDiUH9n6sswtqjXHtWjXMYLRTLg7H/XGs7xhX8DCQYjJze3M
Ssf/86T Prisca@LAPTOP-9KJ7VP6F"
      + tags_all        = (known after apply)
    }

  # aws_security_group.default will be created
  + resource "aws_security_group" "default" {
      + arn                    = (known after apply)
      + description            = "Managed by Terraform"
      + egress                 = [
          + {
              + cidr_blocks      = [
                  + "0.0.0.0/0",
                ]
              + description      = ""
              + from_port        = 0
              + ipv6_cidr_blocks = []
              + prefix_list_ids  = []
              + protocol         = "-1"
              + security_groups  = []
              + self             = false
              + to_port          = 0
            },
        ]
      + id                     = (known after apply)
      + ingress                = [
          + {
              + cidr_blocks      = [
                  + "0.0.0.0/0",
                ]
              + description      = ""
              + from_port        = 22
              + ipv6_cidr_blocks = []
              + prefix_list_ids  = []
              + protocol         = "tcp"
              + security_groups  = []
              + self             = false
```



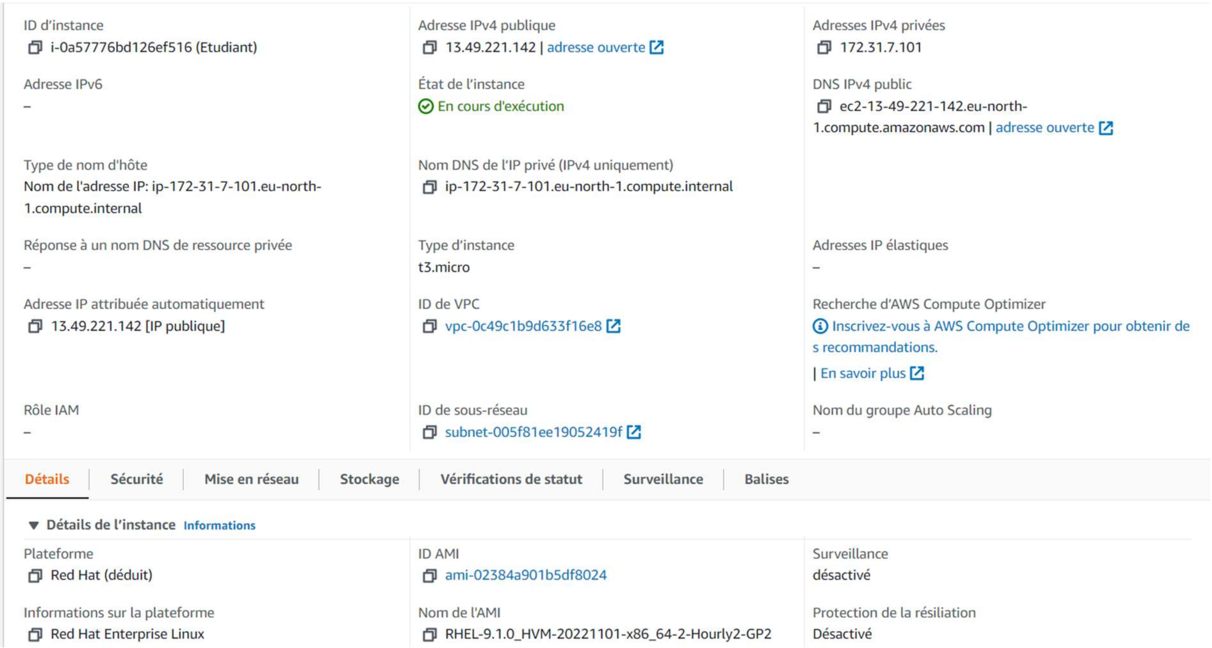
```
              + from_port         = 0
              + ipv6_cidr_blocks  = []
              + prefix_list_ids   = []
              + protocol          = "-1"
              + security_groups   = []
              + self              = false
              + to_port           = 0
            },
        ]
      + id                     = (known after apply)
      + ingress                = [
          + {
              + cidr_blocks       = [
                  + "0.0.0.0/0",
                ]
              + description       = ""
              + from_port         = 22
              + ipv6_cidr_blocks  = []
              + prefix_list_ids   = []
              + protocol          = "tcp"
              + security_groups   = []
              + self              = false
              + to_port           = 22
            },
          + {
              + cidr_blocks       = [
                  + "0.0.0.0/0",
                ]
              + description       = ""
              + from_port         = 80
              + ipv6_cidr_blocks  = []
              + prefix_list_ids   = []
              + protocol          = "tcp"
              + security_groups   = []
              + self              = false
              + to_port           = 80
            },
        ]
      + name                   = (known after apply)
      + name_prefix            = (known after apply)
      + owner_id               = (known after apply)
      + revoke_rules_on_delete = false
      + tags_all               = (known after apply)
      + vpc_id                 = (known after apply)
    }

Plan: 3 to add, 0 to change, 0 to destroy.

─────────────────────────────────────────────────────────────────────────────

Note: You didn't use the -out option to save this plan, so Terraform can't
guarantee to take exactly these actions if you run "terraform apply" now.
```

Capture d'écran du tableau de bord AWS montrant la VM démarrée et son « tag » :



État de l'instance = running ✕

□	Name	ID d'instance	État de l'insta...	Type d'insta...	Contrôle des st...	Statut d'alar...	Zone de dispon...	DNS IPv4 public
□	Etudiant	i-0a57776bd126ef516	✓ En cours d'exé	t3.micro	Initialisation en co	Aucune al... +	eu-north-1c	ec2-13-49-221-1



ID d'instance
i-0a57776bd126ef516 (Etudiant)

Adresse IPv4 publique
13.49.221.142 | adresse ouverte

Adresses IPv4 privées
172.31.7.101

Adresse IPv6
–

État de l'instance
En cours d'exécution

DNS IPv4 public
ec2-13-49-221-142.eu-north-1.compute.amazonaws.com | adresse ouverte

Type de nom d'hôte
Nom de l'adresse IP: ip-172-31-7-101.eu-north-1.compute.internal

Nom DNS de l'IP privé (IPv4 uniquement)
ip-172-31-7-101.eu-north-1.compute.internal

Réponse à un nom DNS de ressource privée
–

Type d'instance
t3.micro

Adresses IP élastiques
–

Adresse IP attribuée automatiquement
13.49.221.142 [IP publique]

ID de VPC
vpc-0c49c1b9d633f16e8

Recherche d'AWS Compute Optimizer
Inscrivez-vous à AWS Compute Optimizer pour obtenir des recommandations.
| En savoir plus

Rôle IAM
–

ID de sous-réseau
subnet-005f81ee19052419f

Nom du groupe Auto Scaling
–

▼ Détails de l'instance Informations

Plateforme
Red Hat (déduit)

ID AMI
ami-02384a901b5df8024

Surveillance
désactivé

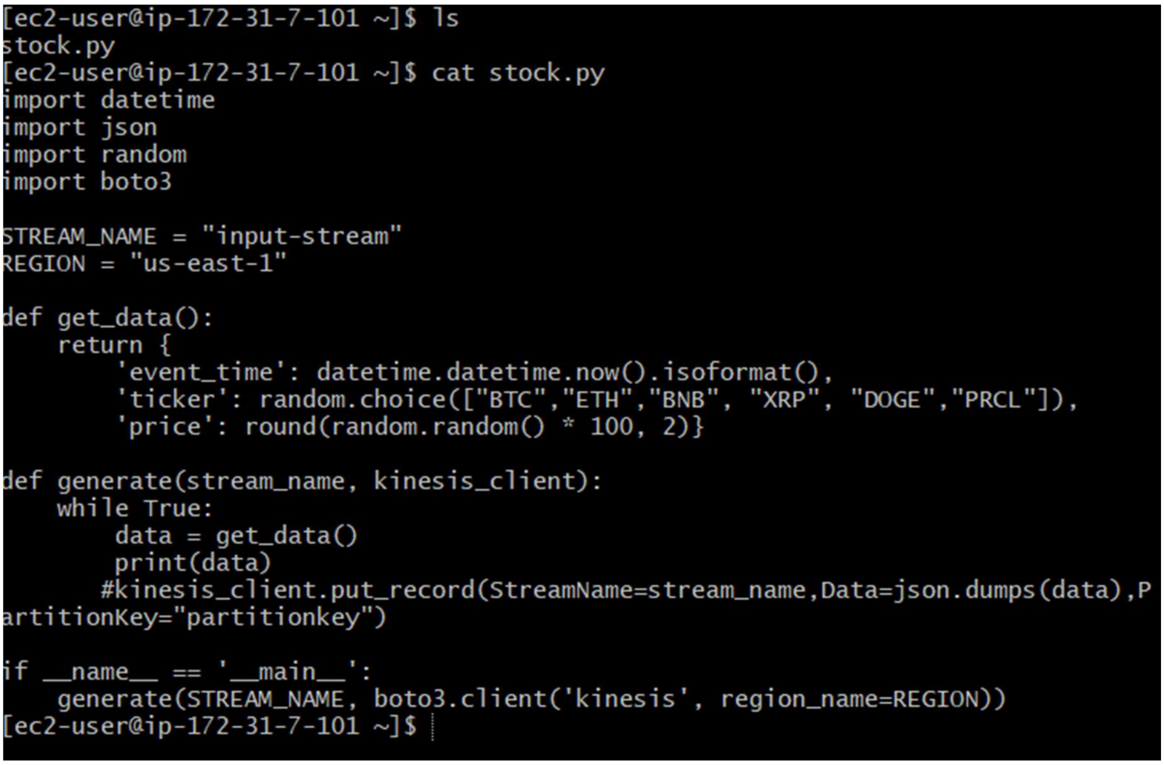
Informations sur la plateforme
Red Hat Enterprise Linux

Nom de l'AMI
RHEL-9.1.0_HVM-20221101-x86_64-2-Hourly2-GP2

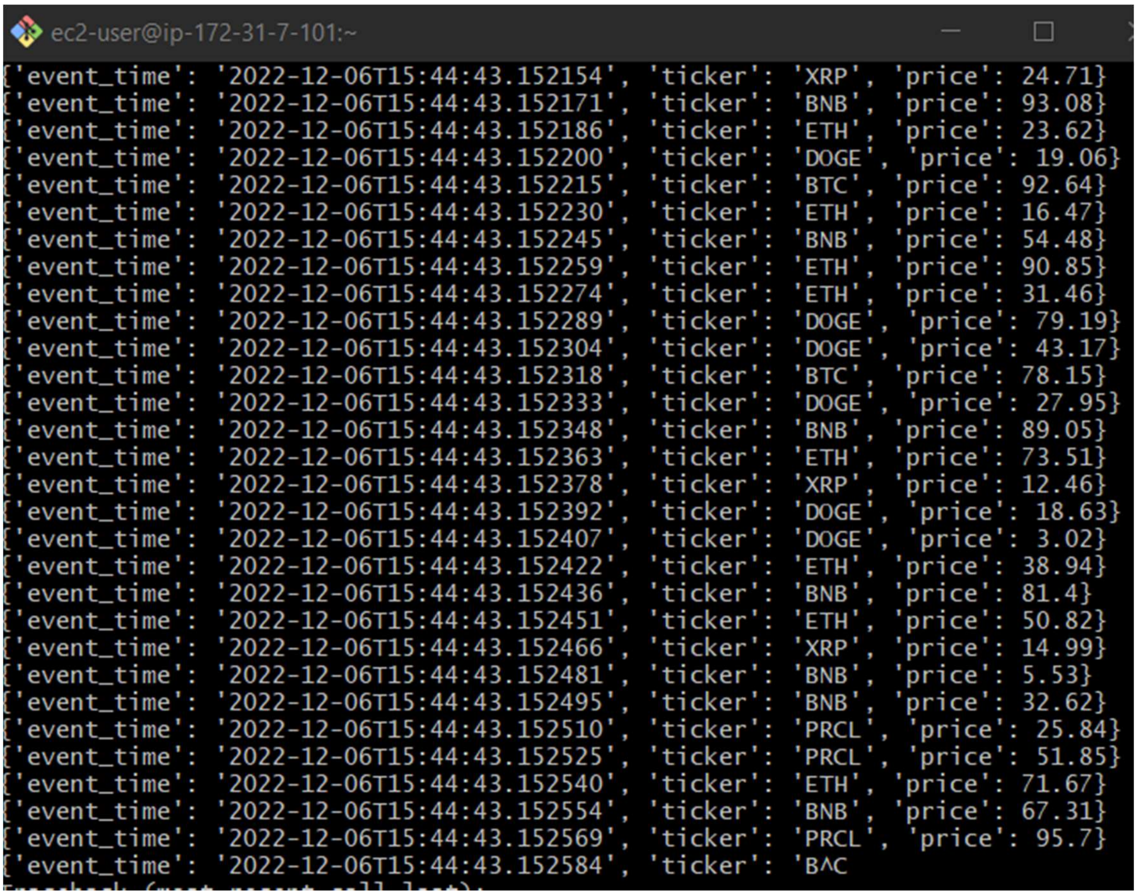
Protection de la résiliation
Désactivé

Question 2)
Se connecter :
ssh -i "prisca-clio-key.pem" ec2-user@ec2-13-49-221-142.eu-north-1.compute.amazonaws.com

sudo yum install -y python
sudo yum install -y pip
sudo pip install boto3

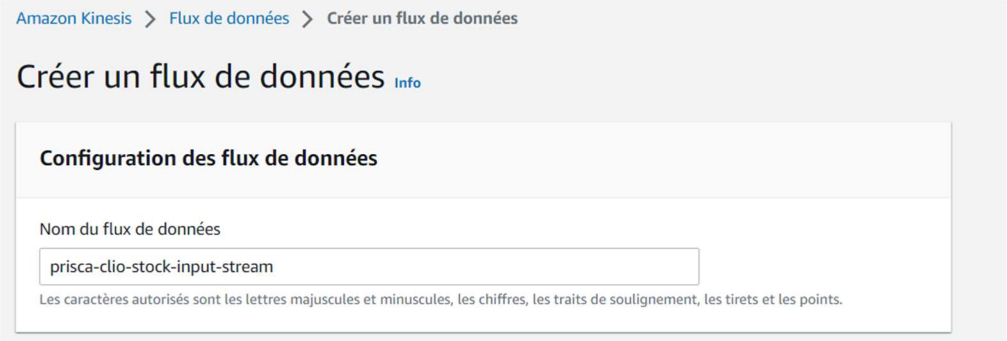


```
[ec2-user@ip-172-31-7-101 ~]$ ls
stock.py
[ec2-user@ip-172-31-7-101 ~]$ cat stock.py
import datetime
import json
import random
import boto3

STREAM_NAME = "input-stream"
REGION = "us-east-1"

def get_data():
    return {
        'event_time': datetime.datetime.now().isoformat(),
        'ticker': random.choice(["BTC","ETH","BNB", "XRP", "DOGE","PRCL"]),
        'price': round(random.random() * 100, 2)}

def generate(stream_name, kinesis_client):
    while True:
        data = get_data()
        print(data)
       #kinesis_client.put_record(StreamName=stream_name,Data=json.dumps(data),P
artitionKey="partitionkey")

if __name__ == '__main__':
    generate(STREAM_NAME, boto3.client('kinesis', region_name=REGION))
[ec2-user@ip-172-31-7-101 ~]$
```



```
{'event_time': '2022-12-06T15:44:43.152154', 'ticker': 'XRP', 'price': 24.71}
{'event_time': '2022-12-06T15:44:43.152171', 'ticker': 'BNB', 'price': 93.08}
{'event_time': '2022-12-06T15:44:43.152186', 'ticker': 'ETH', 'price': 23.62}
{'event_time': '2022-12-06T15:44:43.152200', 'ticker': 'DOGE', 'price': 19.06}
{'event_time': '2022-12-06T15:44:43.152215', 'ticker': 'BTC', 'price': 92.64}
{'event_time': '2022-12-06T15:44:43.152230', 'ticker': 'ETH', 'price': 16.47}
{'event_time': '2022-12-06T15:44:43.152245', 'ticker': 'BNB', 'price': 54.48}
{'event_time': '2022-12-06T15:44:43.152259', 'ticker': 'ETH', 'price': 90.85}
{'event_time': '2022-12-06T15:44:43.152274', 'ticker': 'ETH', 'price': 31.46}
{'event_time': '2022-12-06T15:44:43.152289', 'ticker': 'DOGE', 'price': 79.19}
{'event_time': '2022-12-06T15:44:43.152304', 'ticker': 'DOGE', 'price': 43.17}
{'event_time': '2022-12-06T15:44:43.152318', 'ticker': 'BTC', 'price': 78.15}
{'event_time': '2022-12-06T15:44:43.152333', 'ticker': 'DOGE', 'price': 27.95}
{'event_time': '2022-12-06T15:44:43.152348', 'ticker': 'BNB', 'price': 89.05}
{'event_time': '2022-12-06T15:44:43.152363', 'ticker': 'ETH', 'price': 73.51}
{'event_time': '2022-12-06T15:44:43.152378', 'ticker': 'XRP', 'price': 12.46}
{'event_time': '2022-12-06T15:44:43.152392', 'ticker': 'DOGE', 'price': 18.63}
{'event_time': '2022-12-06T15:44:43.152407', 'ticker': 'DOGE', 'price': 3.02}
{'event_time': '2022-12-06T15:44:43.152422', 'ticker': 'ETH', 'price': 38.94}
{'event_time': '2022-12-06T15:44:43.152436', 'ticker': 'BNB', 'price': 81.4}
{'event_time': '2022-12-06T15:44:43.152451', 'ticker': 'ETH', 'price': 50.82}
{'event_time': '2022-12-06T15:44:43.152466', 'ticker': 'XRP', 'price': 14.99}
{'event_time': '2022-12-06T15:44:43.152481', 'ticker': 'BNB', 'price': 5.53}
{'event_time': '2022-12-06T15:44:43.152495', 'ticker': 'BNB', 'price': 32.62}
{'event_time': '2022-12-06T15:44:43.152510', 'ticker': 'PRCL', 'price': 25.84}
{'event_time': '2022-12-06T15:44:43.152525', 'ticker': 'PRCL', 'price': 51.85}
{'event_time': '2022-12-06T15:44:43.152540', 'ticker': 'ETH', 'price': 71.67}
{'event_time': '2022-12-06T15:44:43.152554', 'ticker': 'BNB', 'price': 67.31}
{'event_time': '2022-12-06T15:44:43.152569', 'ticker': 'PRCL', 'price': 95.7}
{'event_time': '2022-12-06T15:44:43.152584', 'ticker': 'B^C
```

Question 3)



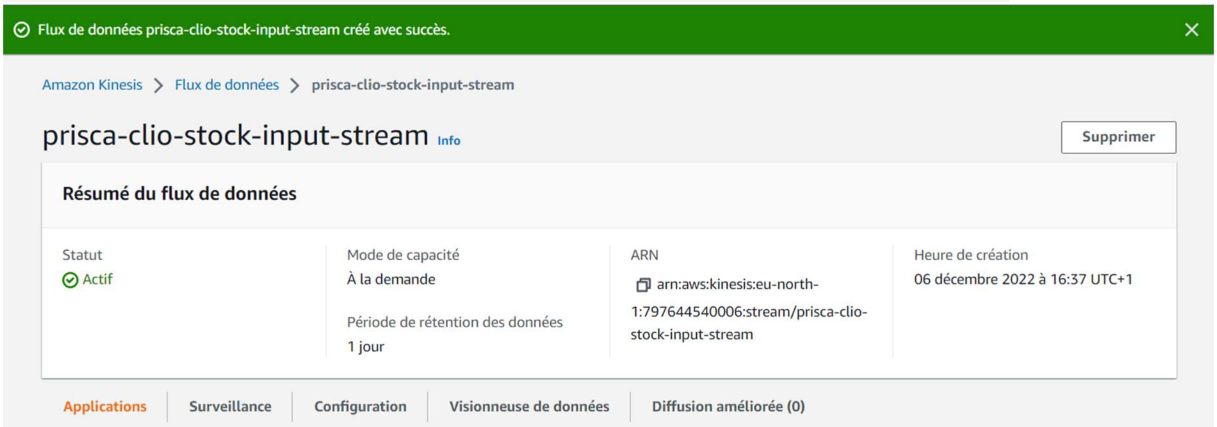
Créer un flux de données Info

Configuration des flux de données

Nom du flux de données

prisca-clio-stock-input-stream

Les caractères autorisés sont les lettres majuscules et minuscules, les chiffres, les traits de soulignement, les tirets et les points.



Flux de données prisca-clio-stock-input-stream créé avec succès.

Amazon Kinesis > Flux de données > prisca-clio-stock-input-stream

prisca-clio-stock-input-stream Info

Résumé du flux de données

Statut: Actif

Mode de capacité: À la demande

Période de rétention des données: 1 jour

ARN: arn:aws:kinesis:eu-north-1:797644540006:stream/prisca-clio-stock-input-stream

Heure de création: 06 décembre 2022 à 16:37 UTC+1

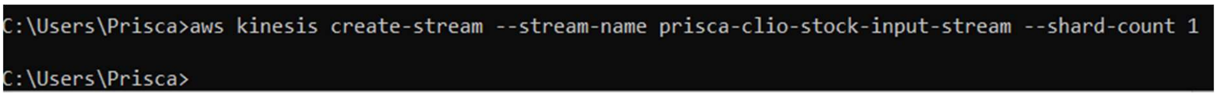
Question 4)

1) Supprimer le data stream

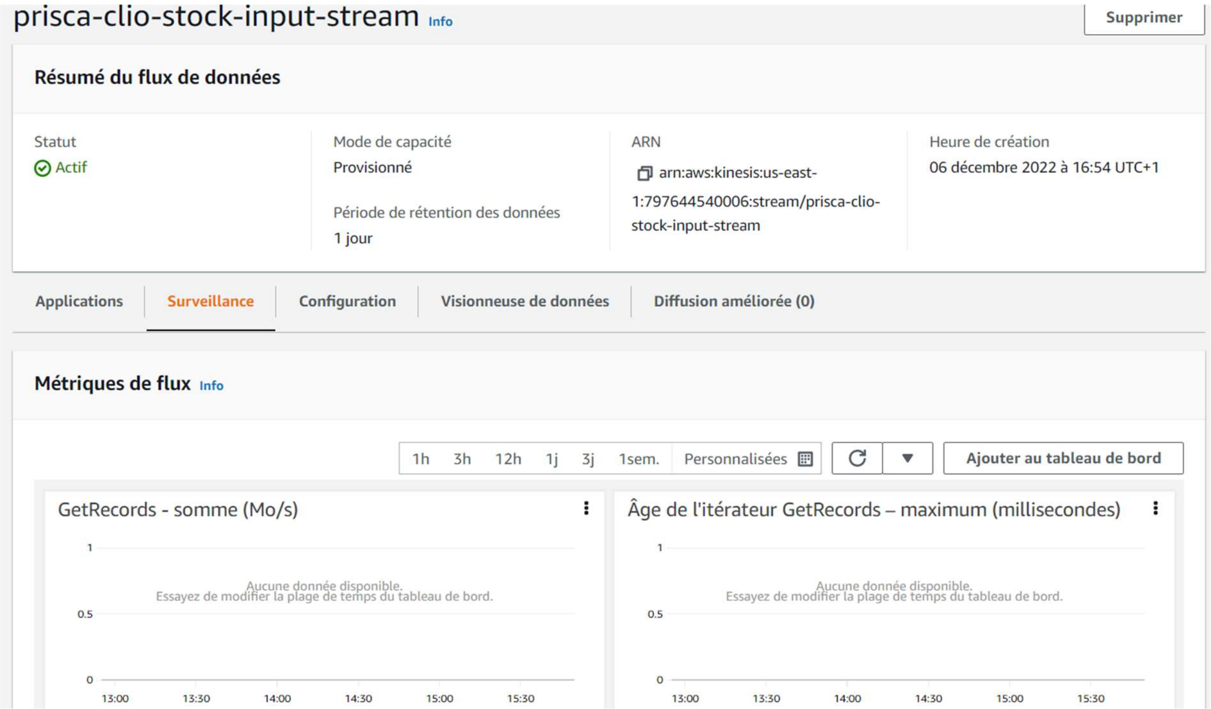
aws kinesis delete-stream --stream-name prisca-clio-stock-input-stream

2) Créer un data stream

```
aws kinesis create-stream --stream-name prisca-clio-stock-input-stream --
shard-count 1
```



```
C:\Users\Prisca>aws kinesis create-stream --stream-name prisca-clio-stock-input-stream --shard-count 1

C:\Users\Prisca>
```



prisca-clio-stock-input-stream Info

Résumé du flux de données

Statut: Actif

Mode de capacité: Provisionné

Période de rétention des données: 1 jour

ARN: arn:aws:kinesis:us-east-1:797644540006:stream/prisca-clio-stock-input-stream

Heure de création: 06 décembre 2022 à 16:54 UTC+1

Métriques de flux Info

GetRecords - somme (Mo/s)

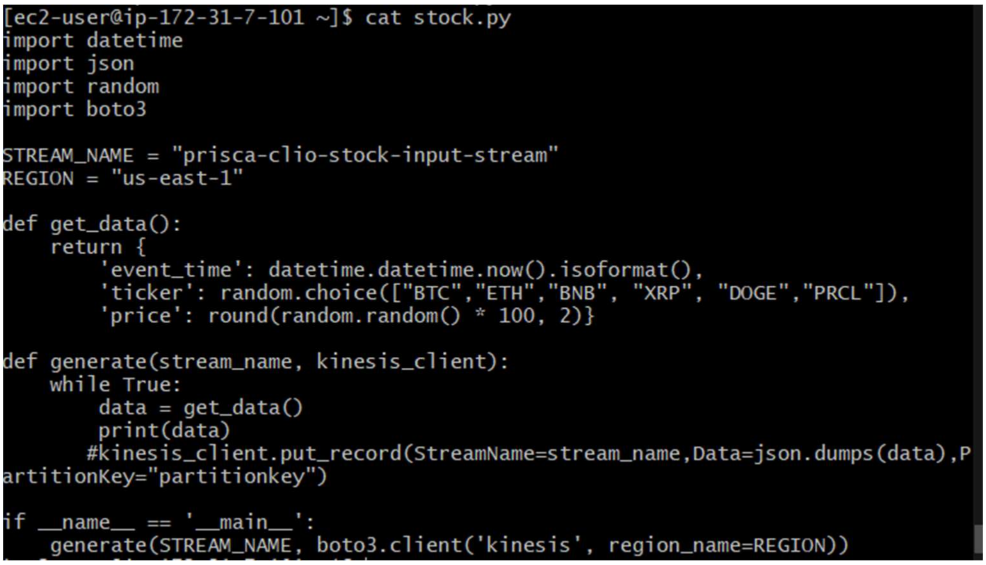
Aucune donnée disponible.
Essayez de modifier la plage de temps du tableau de bord.

Âge de l'itérateur GetRecords – maximum (millisecondes)

Aucune donnée disponible.
Essayez de modifier la plage de temps du tableau de bord.

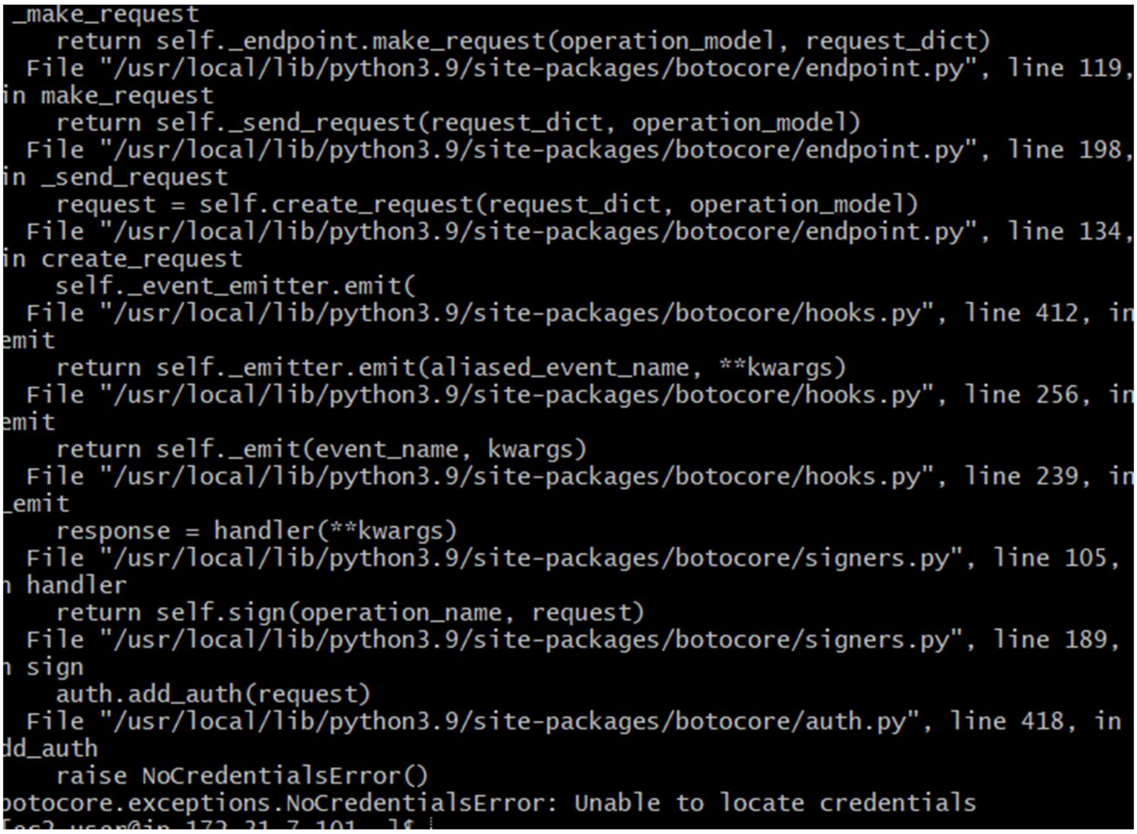
Question 5)

1)Modification du code python



```
[ec2-user@ip-172-31-7-101 ~]$ cat stock.py
import datetime
import json
import random
import boto3

STREAM_NAME = "prisca-clio-stock-input-stream"
REGION = "us-east-1"

def get_data():
    return {
        'event_time': datetime.datetime.now().isoformat(),
        'ticker': random.choice(["BTC","ETH","BNB", "XRP", "DOGE","PRCL"]),
        'price': round(random.random() * 100, 2)}

def generate(stream_name, kinesis_client):
    while True:
        data = get_data()
        print(data)
       #kinesis_client.put_record(StreamName=stream_name,Data=json.dumps(data),P
artitionKey="partitionkey")

if __name__ == '__main__':
    generate(STREAM_NAME, boto3.client('kinesis', region_name=REGION))
```

Exécution :



```
 _make_request
    return self._endpoint.make_request(operation_model, request_dict)
  File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 119,
in make_request
    return self._send_request(request_dict, operation_model)
  File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 198,
in _send_request
    request = self.create_request(request_dict, operation_model)
  File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 134,
in create_request
    self._event_emitter.emit(
  File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 412, in
emit
    return self._emitter.emit(aliased_event_name, **kwargs)
  File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 256, in
emit
    return self._emit(event_name, kwargs)
  File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 239, in
_emit
    response = handler(**kwargs)
  File "/usr/local/lib/python3.9/site-packages/botocore/signers.py", line 105,
n handler
    return self.sign(operation_name, request)
  File "/usr/local/lib/python3.9/site-packages/botocore/signers.py", line 189,
n sign
    auth.add_auth(request)
  File "/usr/local/lib/python3.9/site-packages/botocore/auth.py", line 418, in
dd_auth
    raise NoCredentialsError()
botocore.exceptions.NoCredentialsError: Unable to locate credentials
[ec2-user@ip-172-31-7-101 ~]$
```

2)

3)

Pour supprimer le data stream on fait comme pour la question précedante et pour supprimer la vm on fait terraform destroy

Question 6)