```
In [1]: import sagemaker
        import boto3
        from sagemaker.amazon.amazon_estimator import get_image_uri
        from sagemaker.session import s3_input,Session
```

```
/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/pandas/co
re/computation/expressions.py:21: UserWarning: Pandas requires version '2.8.
0' or newer of 'numexpr' (version '2.7.3' currently installed).
  from pandas.core.computation.check import NUMEXPR_INSTALLED

sagemaker.config INFO - Not applying SDK defaults from location: /etc/xdg/sa
gemaker/config.yaml
sagemaker.config INFO - Not applying SDK defaults from location: /home/ec2-u
ser/.config/sagemaker/config.yaml
```

```
In [2]: bucketname  = 'praveen-sage-maker-practice-2'
        my_region = boto3.session.Session().region_name
        print(my_region)
```
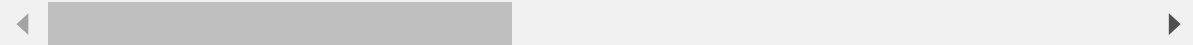
```
us-east-1
```

```
In [3]: s3 = boto3.resource('s3')
        s3.create_bucket(Bucket = bucketname)
```

```
Out[3]: s3.Bucket(name='praveen-sage-maker-practice-2')
```

```
In [4]: prefix = 'xgboost-as-abuilt-in-algo'
        output_path = 's3://{}/{}/output'.format(bucketname,prefix)
```

```
In [5]: import pandas as pd
        import urllib
        urllib.request.urlretrieve("https://d1.awsstatic.com/tmt/build-train-deploy-ma
        model_data = pd.read_csv('./bank_clean.csv',index_col = 0)
```
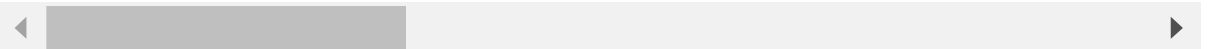
In [6]:
```python
model_data.head()
```

Out[6]:

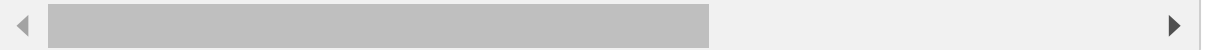|	age	campaign	pdays	previous	no_previous_contact	not_working	job_admin.	job_blue-collar	j
0	56	1	999	0	1	0	0	0	
1	57	1	999	0	1	0	0	0	
2	37	1	999	0	1	0	0	0	
3	40	1	999	0	1	0	1	0	
4	56	1	999	0	1	0	0	0	

5 rows × 61 columns

In [7]:
```python
import numpy as np
train_data, test_data = np.split(model_data.sample(frac=1, random_state=1729)
print(train_data.shape, test_data.shape)
```

```
(28831, 61) (12357, 61)
```

```
/home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages/numpy/cor
e/fromnumeric.py:57: FutureWarning: 'DataFrame.swapaxes' is deprecated and w
ill be removed in a future version. Please use 'DataFrame.transpose' instea
d.
  return bound(*args, **kwds)
```

In [8]:
```python
import os
pd.concat([train_data['y_yes'],train_data.drop(['y_yes','y_no'],axis = 1)],ax
```

In [9]:
```python
boto3.Session().resource('s3').Bucket(bucketname).Object(os.path.join(prefix,
s3_input_train = sagemaker.TrainingInput(s3_data='s3://{}/{}/train'.format(bu
```

In [10]:
```python
# Test Data Into Buckets
pd.concat([test_data['y_yes'], test_data.drop(['y_no', 'y_yes'], axis=1)], ax
boto3.Session().resource('s3').Bucket(bucketname).Object(os.path.join(prefix,
s3_input_test = sagemaker.TrainingInput(s3_data='s3://{}/{}/test'.format(bucke
```

In [11]:
```python
container = get_image_uri(boto3.Session().region_name,'xgboost',repo_version=
```

```
The method get_image_uri has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
```

```python
In [12]: hyperparameters = {
            "max_depth":"5",
            "eta":"0.2",
            "gamma":"4",
            "min_child_weight":"6",
            "subsample":"0.7",
            "objective":"binary:logistic",
            "num_round":50
            }
```

```python
In [14]: estimator = sagemaker.estimator.Estimator(image_uri=container,
                                    hyperparameters=hyperparameters,
                                    role=sagemaker.get_execution_role(),
                                    train_instance_count=1,
                                    train_instance_type='ml.m5.2xlarge',
                                    train_volume_size=5, # 5 GB
                                    output_path=output_path,
                                    train_use_spot_instances=True,
                                    train_max_run=300,
                                    train_max_wait=600)
```

```
sagemaker.config INFO - Not applying SDK defaults from location: /etc/xdg/sa
gemaker/config.yaml
sagemaker.config INFO - Not applying SDK defaults from location: /home/ec2-u
ser/.config/sagemaker/config.yaml

train_instance_count has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
train_instance_type has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
train_max_run has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
train_use_spot_instances has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
train_max_wait has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.
train_volume_size has been renamed in sagemaker>=2.
See: https://sagemaker.readthedocs.io/en/stable/v2.html (https://sagemaker.r
eadthedocs.io/en/stable/v2.html) for details.

sagemaker.config INFO - Not applying SDK defaults from location: /etc/xdg/sa
gemaker/config.yaml
sagemaker.config INFO - Not applying SDK defaults from location: /home/ec2-u
ser/.config/sagemaker/config.yaml
```

In [15]:
```python
estimator.fit({'train':s3_input_train,'validation':s3_input_test})
```

```
INFO:sagemaker:Creating training-job with name: sagemaker-xgboost-2023-12-12
-00-06-01-158

2023-12-12 00:06:01 Starting - Starting the training job...
2023-12-12 00:06:14 Starting - Insufficient capacity error from EC2 while la
unching instances, retryin
g!.............................................................
2023-12-12 00:16:15 Stopping - Stopping the training job
2023-12-12 00:16:15 MaxWaitTimeExceeded - Training job wait time exceeded Ma
xWaitTimeInSeconds provided
..

WARNING:sagemaker:Job ended with status 'Stopped' rather than 'Completed'. T
his could mean the job timed out or stopped early for some other reason: Con
sider checking whether it completed as you expect.
```

In [*]:
```python
sagemaker.Session().delete_endpoint(xgb_predictor.endpoint)
bucket_to_delete = boto3.resource('s3').Bucket(bucket_name)
bucket_to_delete.objects.all().delete()
```

In [ ]: