

## Lab 4 - Creating a Forecast with Amazon Forecast

```
import sagemaker
import time, sys, os, io, json
import xlsxwriter
!pip install pandas==1.5.3

sagemaker.config.INFO -- Not applying SDK defaults from location: /etc/xdg/sagemaker/config.yaml
sagemaker.config.INFO -- Not applying SDK defaults from location: /home/ec2-user/.config/sagemaker/config.yaml
Requirement already satisfied: pandas==1.5.3 in /home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages (1.5.3)
Requirement already satisfied: python-dateutil<=2.8.1 in /home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages (from pandas==1.5.3) (2.8.2)
Requirement already satisfied: pytz==2020.1 in /home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages (from pandas==1.5.3) (2020.1)
Requirement already satisfied: numpy>=1.21.0 in /home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages (from pandas==1.5.3) (1.22.4)
Requirement already satisfied: six>=1.5 in /home/ec2-user/anaconda3/envs/python3/lib/python3.10/site-packages (from python-dateutil<=2.8.1->pandas==1.5.3) (1.16.0)

[2]: retail = pd.read_excel('online_retail_II.xlsx', engine='openpyxl')

[3]: print(retail)

Invoice StockCode Description Quantity \
0 489434 85048 15CM CHRISTMAS GLASS BALL 20 LIGHTS 12
1 489434 79323P PINK CHERRY LIGHTS 12
2 489434 79323W WHITE CHERRY LIGHTS 12
3 489434 22041 RECORD FRAME 7" SINGLE SIZE 48
4 489434 21232 STRAWBERRY CERAMIC TRINKET BOX 24
... ..
525456 538171 22271 FELTCRAFT DOLL ROSIE 2
525457 538171 22750 FELTCRAFT PRINCESS LOLA DOLL 1
525458 538171 22751 FELTCRAFT PRINCESS OLIVIA DOLL 1
525459 538171 28970 PINK FLORAL FELTCRAFT SHOULDER BAG 2
525460 538171 21931 JUMBO STORAGE BAG SUKI 2

InvoiceDate Price Customer ID Country
0 2009-12-01 07:45:00 6.95 13085.0 United Kingdom
1 2009-12-01 07:45:00 6.75 13085.0 United Kingdom
2 2009-12-01 07:45:00 6.75 13085.0 United Kingdom
3 2009-12-01 07:45:00 2.10 13085.0 United Kingdom
4 2009-12-01 07:45:00 1.25 13085.0 United Kingdom
... ..
525456 2010-12-09 20:01:00 2.05 17530.0 United Kingdom
525457 2010-12-09 20:01:00 3.75 17530.0 United Kingdom
525458 2010-12-09 20:01:00 3.75 17530.0 United Kingdom
525459 2010-12-09 20:01:00 3.75 17530.0 United Kingdom
525460 2010-12-09 20:01:00 1.95 17530.0 United Kingdom

[525461 rows x 8 columns]

[7]: print("hi")

hi

[ ]:

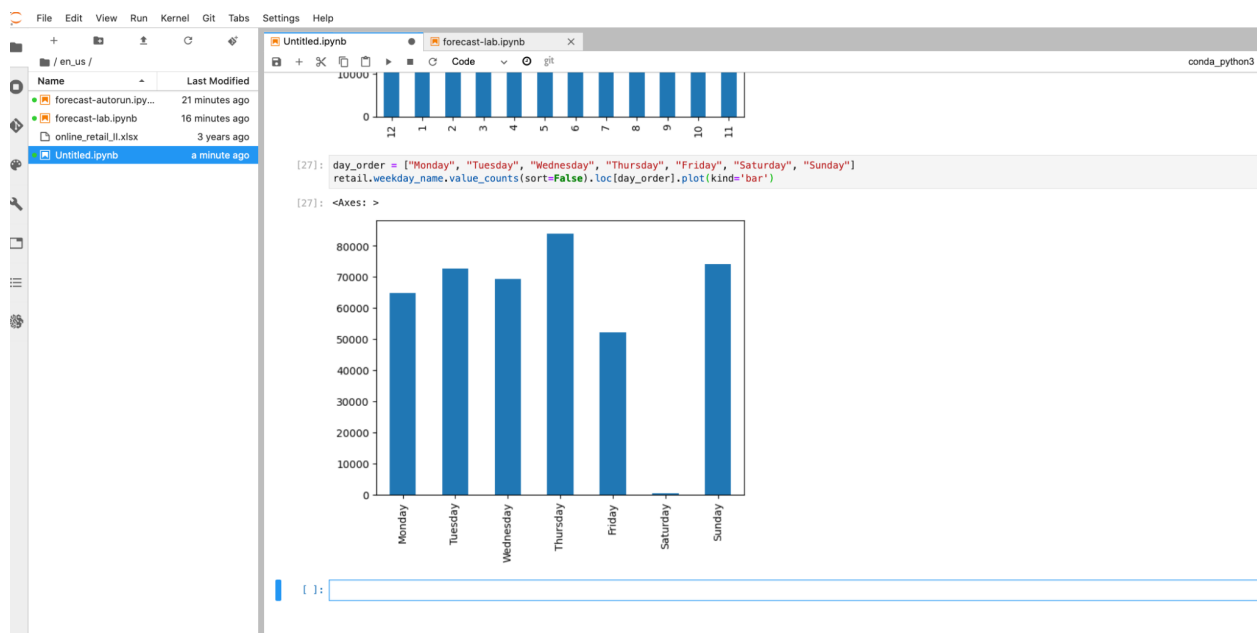
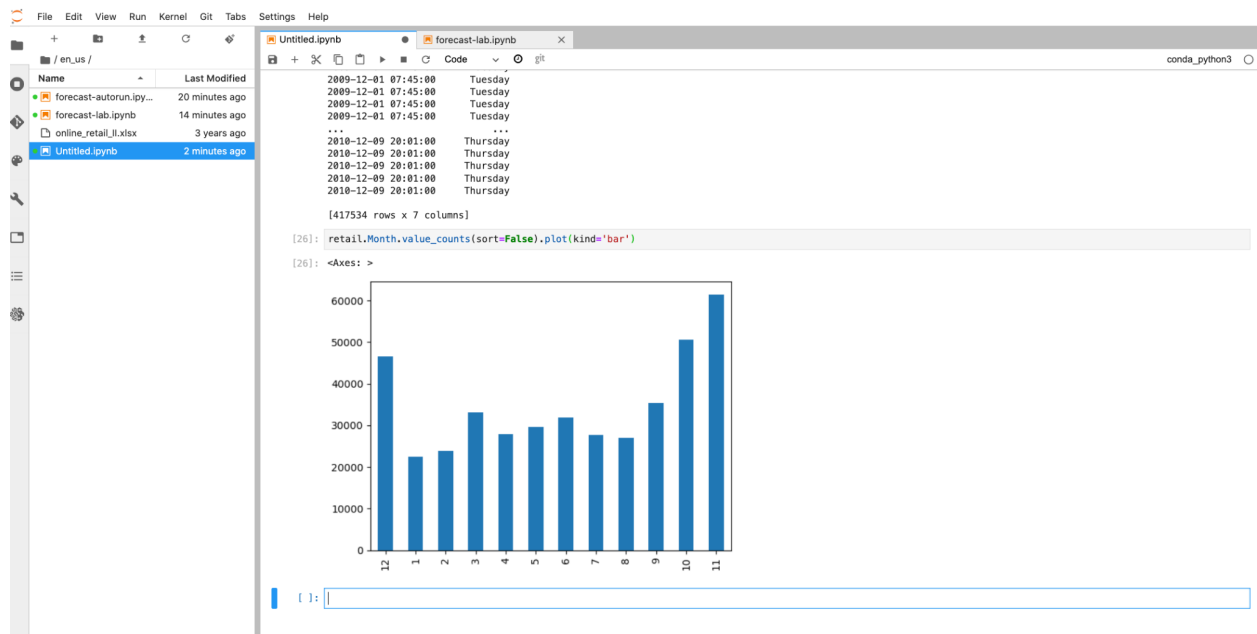
[11]: retail.dtypes

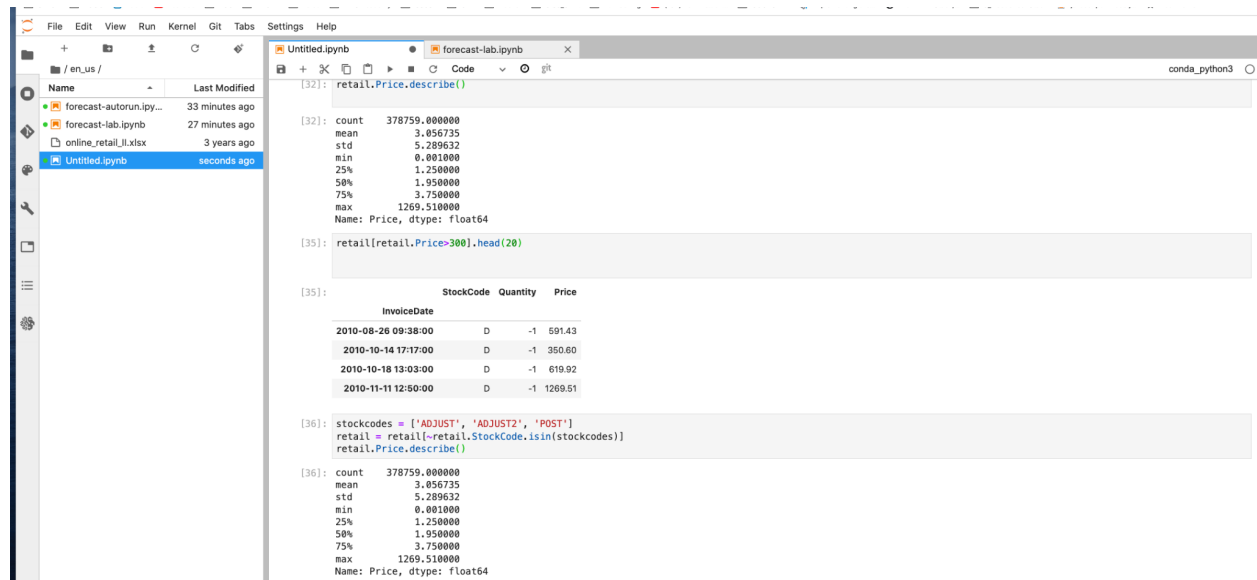
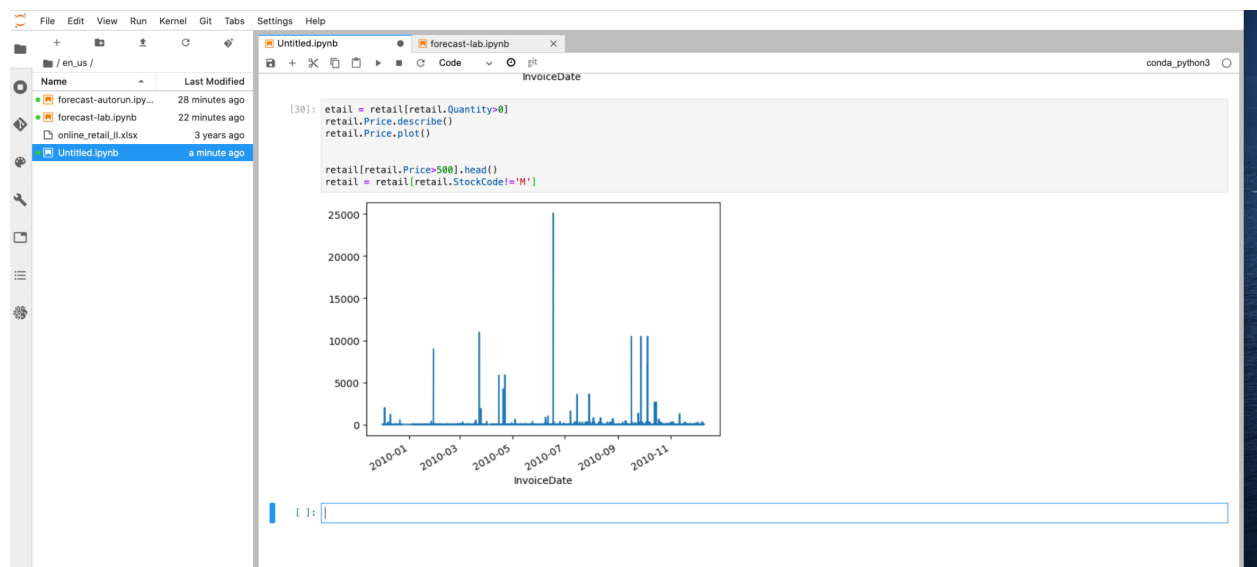
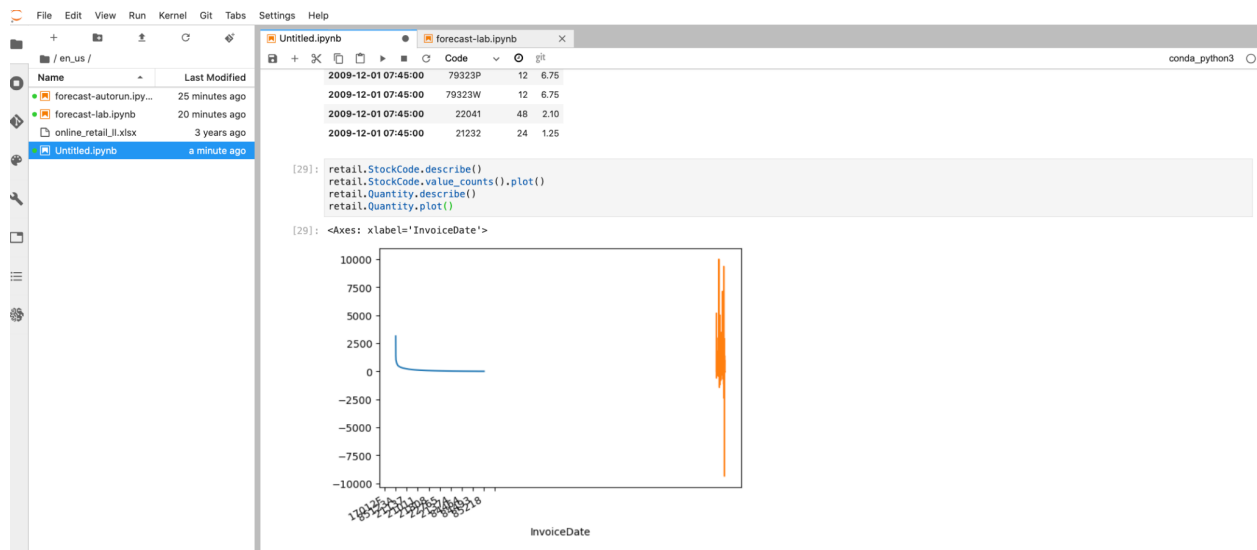
Invoice object
StockCode object
Description object
Quantity int64
InvoiceDate datetime64[ns]
Price float64
Customer ID float64
Country object
dtype: object

[12]: retail.head(20)

Invoice StockCode Description Quantity InvoiceDate Price Customer ID Country
0 489434 85048 15CM CHRISTMAS GLASS BALL 20 LIGHTS 12 2009-12-01 07:45:00 6.95 13085.0 United Kingdom
1 489434 79323P PINK CHERRY LIGHTS 12 2009-12-01 07:45:00 6.75 13085.0 United Kingdom
2 489434 79323W WHITE CHERRY LIGHTS 12 2009-12-01 07:45:00 6.75 13085.0 United Kingdom
3 489434 22041 RECORD FRAME 7" SINGLE SIZE 48 2009-12-01 07:45:00 2.10 13085.0 United Kingdom
4 489434 21232 STRAWBERRY CERAMIC TRINKET BOX 24 2009-12-01 07:45:00 1.25 13085.0 United Kingdom
5 489434 22064 PINK DOUGHNUT TRINKET POT 24 2009-12-01 07:45:00 1.65 13085.0 United Kingdom
6 489434 21871 SAVE THE PLANET MUG 24 2009-12-01 07:45:00 1.25 13085.0 United Kingdom
7 489434 21523 FANCY FONT HOME SWEET HOME DOORMAT 10 2009-12-01 07:45:00 5.95 13085.0 United Kingdom
8 489435 22350 CAT BOWL 12 2009-12-01 07:46:00 2.55 13085.0 United Kingdom
9 489435 22349 DOG BOWL, CHASING BALL DESIGN 12 2009-12-01 07:46:00 3.75 13085.0 United Kingdom
10 489435 22195 HEART MEASURING SPOONS LARGE 24 2009-12-01 07:46:00 1.65 13085.0 United Kingdom
11 489435 22353 LUNCHBOX WITH CUTLERY FAIRY CAKES 12 2009-12-01 07:46:00 2.55 13085.0 United Kingdom
12 489436 48173C DOOR MAT BLACK FLOCK 10 2009-12-01 09:06:00 5.95 13078.0 United Kingdom
13 489436 21765 LOVE BUILDING BLOCK WORD 18 2009-12-01 09:06:00 5.45 13078.0 United Kingdom
14 489436 21764 HOME BUILDING BLOCK WORD 3 2009-12-01 09:06:00 5.95 13078.0 United Kingdom
15 489436 84879 ASSORTED COLOUR BIRD ORNAMENT 16 2009-12-01 09:06:00 1.69 13078.0 United Kingdom
16 489436 22119 PEACE WOODEN BLOCK LETTERS 3 2009-12-01 09:06:00 6.95 13078.0 United Kingdom
17 489436 22142 CHRISTMAS CRAFT WHITE FAIRY 12 2009-12-01 09:06:00 1.45 13078.0 United Kingdom
18 489436 22296 HEART IVORY TRELLIS LARGE 12 2009-12-01 09:06:00 1.65 13078.0 United Kingdom
19 489436 22295 HEART FLIGREE DOVE LARGE 12 2009-12-01 09:06:00 1.65 13078.0 United Kingdom

[ ]:
```





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Name

Last Modified

forecast-autorun.ipynb

an hour ago

forecast-lab.ipynb

41 minutes ago

online\_retail\_II.xlsx

3 years ago

Untitled.ipynb

seconds ago

forecast-lab.ipynb

conda\_python3

2009-12-01

10002

12

2009-12-02

10002

0

2009-12-03

10002

7

2009-12-04

10002

25

2009-12-05

10002

0

...

...

...

2010-12-05

21232

4

2010-12-06

21232

12

2010-12-07

21232

28

2010-12-08

21232

61

2010-12-09

21232

-144

374 rows × 2 columns

[42]:

df\_time\_series = df\_time\_series.groupby('StockCode').resample('D').sum().reset\_index().set\_index(['InvoiceDate'])

[43]:

df\_time\_series[df\_time\_series.StockCode==21232]

[43]:

StockCode

Quantity

InvoiceDate

2009-12-01

21232

171

2009-12-02

21232

164

2009-12-03

21232

186

2009-12-04

21232

264

2009-12-05

21232

36

...

...

...

2010-12-05

21232

4

2010-12-06

21232

12

2010-12-07

21232

28

2010-12-08

21232

61

2010-12-09

21232

-144

downsampling

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Name

Last Modified

forecast-autorun.ipynb

an hour ago

forecast-lab.ipynb

an hour ago

online\_retail\_II.xlsx

3 years ago

Untitled.ipynb

seconds ago

forecast-lab.ipynb

conda\_python3

[50]:

print()

forecast\_response = forecast\_query.query\_forecast(

ForecastArn=forecast\_arn,

Filters={"item\_id":"21232"}

)

print(forecast\_response)

Task 6: Using the forecast

{'Forecast': {'Predictions': {'p10': [{'Timestamp': '2010-11-01T00:00:00', 'Value': -11.5225353241}, {'Timestamp': '2010-11-02T00:00:00', 'Value': 28.4542087446}, {'Timestamp': '2010-11-03T00:00:00', 'Value': 0.6409492493}, {'Timestamp': '2010-11-04T00:00:00', 'Value': 22.9499511719}, {'Timestamp': '2010-11-05T00:00:00', 'Value': 12.8835917282}, {'Timestamp': '2010-11-06T00:00:00', 'Value': -9.7075366974}, {'Timestamp': '2010-11-07T00:00:00', 'Value': 10.6902999878}, {'Timestamp': '2010-11-08T00:00:00', 'Value': -2.403605349}, {'Timestamp': '2010-11-09T00:00:00', 'Value': 0.0015701294}, {'Timestamp': '2010-11-10T00:00:00', 'Value': -7.4712715149}, {'Timestamp': '2010-11-11T00:00:00', 'Value': -24.835559845}, {'Timestamp': '2010-11-12T00:00:00', 'Value': -17.5017166138}, {'Timestamp': '2010-11-13T00:00:00', 'Value': -30.1197967529}, {'Timestamp': '2010-11-14T00:00:00', 'Value': -2.4642601013}, {'Timestamp': '2010-11-15T00:00:00', 'Value': 28.218744278}, {'Timestamp': 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'2010-11-04T00:00:00', 'Value': 48.7191467285}, {'Timestamp': '2010-11-05T00:00:00', 'Value': 22.90899562}, {'Timestamp': '2010-11-06T00:00:00', 'Value': 10.8257637024}, {'Timestamp': '2010-11-07T00:00:00', 'Value': 63.4393806458}, {'Timestamp': '2010-11-08T00:00:00', 'Value': 139.5895233154}, {'Timestamp': '2010-11-09T00:00:00', 'Value': 148.5259549316}, {'Timestamp': '2010-11-10T00:00:00', 'Value': 142.5830383301}, {'Timestamp': '2010-11-11T00:00:00', 'Value': 88.3896636963}, {'Timestamp': '2010-11-12T00:00:00', 'Value': 66.7280883789}, {'Timestamp': '2010-11-13T00:00:00', 'Value': 0.8954854012}, {'Timestamp': '2010-11-14T00:00:00', 'Value': 90.3079528809}, {'Timestamp': '2010-11-15T00:00:00', 'Value': 175.5196228027}, {'Timestamp': '2010-11-16T00:00:00', 'Value': 222.224375}, {'Timestamp': '2010-11-17T00:00:00', 'Value': 93.5080228882}, {'Timestamp': '2010-11-18T00:00:00', 'Value': 71.3357391357}, {'Timestamp': '2010-11-19T00:00:00', 'Value': 40.6339187622}, {'Timestamp': 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